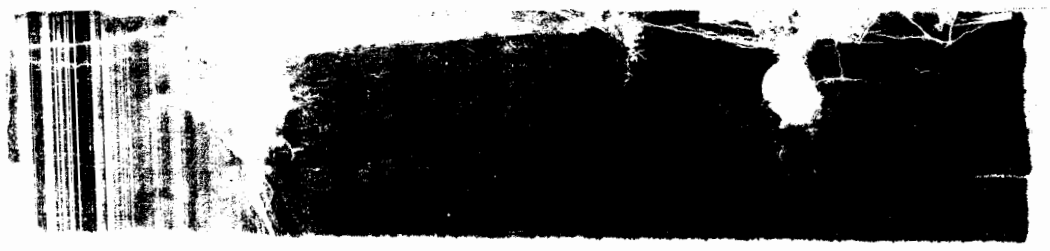

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VOLUME I OF 12 VOLUMES

RECORD OF PROCEEDINGS

of a

COURT OF INQUIRY

convened at

U. S. Naval Submarine Base New London
Groton, Connecticut

and

Portsmouth Naval Shipyard
Portsmouth, New Hampshire

by order of

Commander in Chief
U. S. ATLANTIC FLEET

To inquire into the circumstances
of the loss at sea of

USS THRESHER (SS(N)593)

which occurred on

10 April 1963

Ordered on 10 April 1963

Unclassified

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* Due to voluminous nature of this Exhibit, it is forwarded in accompanying carton, VOLUME XII

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* Due to voluminous nature of this Exhibit, it is forwarded in accompanying carton, VOLUME XII

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UNITED STATES ATLANTIC FLEET
Headquarters of the Commander in Chief
Norfolk 11, Virginia

FF1-2
Serial: 1748 /14
15 April 1963

From: Commander in Chief U. S. Atlantic Fleet
To: Vice Admiral Bernard L. AUSTIN, (b) (6) /1100, USN

Subj: Modification of Order appointing Court of Inquiry into circumstances of loss of USS THRESHER (SS(N)-593) on 10 April 1963

Ref: (a) CINCLANTFLT ltr Ser 1701 of 11 April 1963 to VADM Bernard L. AUSTIN, USN appointing Court of Inquiry

1. In view of the publicly announced conclusion by the Secretary of the Navy on 11 April 1963 that the USS THRESHER and all hands aboard were lost, paragraph 8 of reference (a) is modified in that the Court of Inquiry is relieved of the requirement to make a preliminary report relating to death of personnel.

2. Reference (a) is further modified by the designation of Commander Charles R. DAVIS, (b) (6) '1620, USN a lawyer qualified in the sense of Article 27(b) of the Uniform Code of Military Justice, as Assistant Counsel for the Court.

ROBERT L. DENNISON

Copy to:
SECNAV
CNO
COMSUBLANT
DEPCOMSUBLANT
JAG
BUSHIPS
NAVWARCOLLEGE
COMSIX
CINCLANT REP JSTPS
COMSERVRON 8
COMINLANT
SUBBASE NLON
SUPSHIPS GROTON CONN
NSY PORTSMOUTH NH
CDR C. R. DAVIS (with copy of Ref a)
5 copies to VADM AUSTIN for Court Members and Counsel

"A" -1

PRIORITY/UNCLASSIFIED

FROM: CINCLANTFLT
TO: NAVWARCOLLEGE
COMSIX
CINCLANT REP JSTPS
COMSERVRON 8
COMINLANT
SUBBASE NLON
SUPSHIPS GROTON CONN

1100448Z APR 63 DE-0014

INFO: SECNAV
CNO
COMSUBLANT
DEPCOMSUBLANT
NSY PORTSMOUTH NH
JAG
BUSHIPS

UNCLAS

PERSONAL FOR VICE ADMIRAL BERNARD L. AUSTIN, (b) (6) 1100, USN

COURT OF INQUIRY TO INQUIRE INTO THE CIRCUMSTANCES OF THE LOSS AT SEA OF USS THRESHER (SS(N)-593) ON 10 APRIL 1963.

A. JAG MANUAL
B. MCM 1951, PARA 34

1. IN ACCORDANCE WITH SECTION 0402 OF REFERENCE A, A COURT OF INQUIRY IS HEREBY APPOINTED TO INQUIRE INTO THE CIRCUMSTANCES SURROUNDING THE LOSS AT SEA OF USS THRESHER (SS(N)-593) ON 10 APRIL 1963. THE COURT WILL CONVENE AT NEW LONDON, CONNECTICUT AT 1000, ON 11 APRIL 1963, OR AS SOON THEREAFTER AS PRACTICABLE. IT SHALL MEET AT SUCH OTHER LOCATIONS AS MAY BE NECESSARY.

2. THE COURT SHALL CONSIST OF YOU AS PRESIDENT, REAR ADMIRAL LAWRENCE R. DASPIT, (b) (6) 1100, USN, CAPTAIN WILLIAM C. HUSHING, (b) (6) 1400, USN, CAPTAIN JAMES B. OSBORN, (b) (6) 1100, USN AND CAPTAIN NORMAN C. NASH, (b) (6) 1100, USN AS MEMBERS. CAPTAIN SAUL KATZ, (b) (6) 1620, USN, A LAWYER QUALIFIED

"A" - 3

UNITED STATES ATLANTIC FLEET
Headquarters of the Commander in Chief
Norfolk 11, Virginia

FF1-2
Serial: 1701 /14
11 April 1963

From: Commander in Chief U. S. Atlantic Fleet
To: Vice Admiral Bernard L. AUSTIN, (b) (6) '1100, USN

Subj: Court of Inquiry to inquire into the circumstances of the loss at sea of USS THRESHER (SS(N)-593) on 10 April 1963

Ref: (a) JAG Manual

Encl: (1) CINCLANTFLT 110448Z April 1963

1. As required by section 0208.a(1) of reference (a), enclosure (1), which convened subject Court of Inquiry, is hereby confirmed but modified by the addition of paragraph 8 as follows:

"8. The Court, shall as soon as possible after convening, arrive at findings of fact or opinions relating to deaths of personnel, and as required comply with sections 0803 and 0811 of reference (a). The Court shall promptly furnish the Convening Authority a preliminary report consisting of all available information, findings of fact and opinions relating to deaths of personnel."

Robert L Dennison

ROBERT L. DENNISON

Copy to: (w/encl)
SECNAV
CNO
COMSUBLANT
DEPCOMSUBLANT
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BUSHIPS
NAVWARCOLLEGE
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CINCLANT REP JSTPS
COMSERVRON 8
COMINLANT
SUBBASE NLON
SUPSHIPS GROTON CONN
NSY PORTSMOUTH NH

PRIORITY/UNCLASSIFIED

IN THE SENSE OF ARTICLE 27(B) OF THE UNIFORM CODE OF MILITARY JUSTICE IS HEREBY DESIGNATED COUNSEL FOR THE COURT.

3. THE COURT IS DIRECTED TO INQUIRE INTO ALL THE FACTS AND CIRCUMSTANCES CONNECTED WITH THE LOSS/DEATH OF THE THRESHER; OF, AND INJURIES TO PERSONNEL ABOARD; AS APPROPRIATE TO PERFORM THE DUTIES OF AN INQUEST; AND TO FIX RESPONSIBILITY FOR THE INCIDENT. AFTER DELIBERATION THE COURT SHALL SUBMIT ITS FINDINGS OF FACT, OPINIONS AND RECOMMENDATIONS.

4. AS TO THE DUTY OF THE COURT TO DESIGNATE INDIVIDUALS AS INTERESTED PARTIES TO THE INQUIRY DURING THE PROCEEDINGS WHEN APPROPRIATE, ATTENTION IS PARTICULARLY INVITED TO SECTION 0302 B (2) - (3) OF REFERENCE (A).

5. THE COURT IS DIRECTED TO TAKE THE TESTIMONY OF THE WITNESSES UNDER OATH AND TO SUBMIT A VERBATIM RECORD OF THE PROCEEDINGS. MILITARY WITNESSES WILL BE WARNED OF THEIR RIGHTS IN ACCORDANCE WITH ARTICLE 31 OF THE UNIFORM CODE OF MILITARY JUSTICE PRIOR TO THE TAKING OF THE TESTIMONY. SHOULD THE CONDUCT OF ANY INDIVIDUAL WARRANT RECOMMENDATION FOR TRIAL BY GENERAL COURT MARTIAL, YOU ARE TO ACCORD HIM HIS RIGHTS AS SET FORTH IN REFERENCE (B).

PRIORITY/UNCLASSIFIED

6. COMMANDING OFFICER, U.S. NAVAL SUBMARINE BASE, NEW LONDON, CONNECTICUT, IS DIRECTED TO FURNISH THE NECESSARY REPORTERS AND OTHER CLERICAL ASSISTANCE TO THE COURT FOR THE PURPOSE OF RECORDING THE PROCEEDINGS AND TO PREPARE A RECORD OF PROCEEDINGS OF THIS COURT OF INQUIRY.

7. WRITTEN CONFIRMATION OF THIS MESSAGE ORDER WILL BE ISSUED.

The court, after inquiring into all the facts and circumstances connected with the incident which occasioned the inquiry, and having considered the evidence, finds as follows:

FINDINGS OF FACT

1. That the U.S.S. Thresher (SS(N)593) was built at Portsmouth Naval Shipyard, Portsmouth, New Hampshire, the first of a new class of nuclear powered attack submarines, capable of diving to a depth b(1) and with significant advances in sonar equipment, ability to resist shock, and to operate with reduced noise radiation. (U)

2. That THRESHER under the command of Lieutenant Commander John W. HARVEY, U.S. Navy, (b) (6) 1100, departed Portsmouth Naval Shipyard, on the morning of 9 April 1963, to conduct scheduled sea trials following a post shakedown availability which extended from 16 July 1962 to 11 April 1963.

3. That THRESHER was a unit of Submarine Development Group TWO, and was operating under the orders of Commander Submarine Force, U.S. Atlantic Fleet (Administration) Portsmouth, for the sea trials.

4. That the following persons, in the status indicated, were on board THRESHER when she departed Portsmouth, New Hampshire, and were on board when she was lost:

HARVEY, John W.	LCDR (b) (6)	1100	USN	USS THRESHER
GARNER, Pat M.	LCDR	1100	USN	USS THRESHER
DI NOLA, Michael J.	LCDR	1100	USN	USS THRESHER
LYMAN, John S., Jr.	LCDR	1100	USN	USS THRESHER
SMARZ, John (n), Jr.	LT	1100	USN	USS THRESHER
PARSONS, Guy C., Jr.	LTJG	1100	USN	USS THRESHER
HENRY, James J., Jr.	LTJG	1100	USN	USS THRESHER
BABCOCK, Ronald C.	LTJG	1100	USN	USS THRESHER
WILEY, John J.	LTJG	1100	USN	USS THRESHER
MALINSKI, Frank J.	LTJG	1100	USN	USS THRESHER
COLLIER, Merrill F.	LT	1100	USN	USS THRESHER
GRAFTON, John G.	LTJG	1100	USN	USS THRESHER
KRAG, Robert L.	LCDR	1400	USN	STAFF, DEPUTY COMMANDER SUBMARINE FORCE, U.S. ATLANTIC FLEET
ARSENAULT, Tilmon J.	ENCA(SS)-P2 (b) (6)		USN	USS THRESHER
BAIN, Ronald E.	EN2(SS)-P2		USN	USS THRESHER
BELL, John E.	MM1-P2		USN	USS THRESHER
BOBBITT, Edgar S.	EM2(SS)-P2		USN	USS THRESHER
BOSTER, Gerald C.	EM3(SS)-P1		USN	USS THRESHER
BRACEY, George (n)	SD3(SS)		USN	USS THRESHER
BRANN, Richard P.	EN2(SS)-P2		USN	USS THRESHER
CARKOSKI, Richard J.	EN2(SS)		USN	USS THRESHER
CAYEY, Steven G.	TM2(SS)		USN	USS THRESHER
CHRISTIANSEN, Edward (n)	SN(SS)		USN	USS THRESHER
CLAUSSEN, Larry W.	EM2(SS)-P2		USN	USS THRESHER
CLEMENTS, Thomas E.	ETR3(SS)		USN	USS THRESHER

(b) (6)

CUMMINGS, Francis M.	SOS2(SS)	USN	USS THRESHER
CARMODY, Patrick W.	SK2	USN	USS THRESHER
DABRUZZI, Samuel J.	ETN2(SS)	USN	USS THRESHER
DAY, Donald C.	EN3(SS)	USN	USS THRESHER
DENNY, Roy O., Jr.	EM1(SS)-P2	USN	USS THRESHER
DiBELLA, Peter J.	SN	USN	USS THRESHER
DUNDAS, Don R.	ETN2(SS)	USN	USS THRESHER
DYER, Troy E.	ET1(SS)-P1	USN	USS THRESHER
DAVISON, Clyde E., III	ETR3-P1	USN	USS THRESHER
FORNI, Ellwood H.	SOCA(SS)-P1	USN	USS THRESHER
FOTI, Raymond P.	ET1(SS)	USN	USS THRESHER
FREEMAN, Larry W.	FTM2(SS)	USN	USS THRESHER
FUSCO, Gregory J.	EM2(SS)-P2	USN	USS THRESHER
GALLANT, Andrew J., Jr.	HMC(SS)	USN	USS THRESHER
GARCIA, Napoleon T.	SD1(SS)	USN	USS THRESHER
GARNER, John E.	YNSN(SS)	USN	USS THRESHER
GAYNOR, Robert W.	EN2(SS)	USN	USS THRESHER
GOSNELL, Robert H.	SA(SS)	USNR	USS THRESHER
GRAHAM, William E.	SOC(SS)-P1	USN	USS THRESHER
GUNTER, Aaron J.	QM1(SS)	USN	USS THRESHER
HALL, Richard C.	ETR2(SS)-P2	USN	USS THRESHER
HAYES, Norman T.	EM1-P2	USN	USS THRESHER
HEISER, Laird G.	MM1-P2	USN	USS THRESHER
HELSIUS, Marvin T.	MM2	USN	USS THRESHER
HEWITT, Leonard H.	EMCA(SS)	USN	USS THRESHER
HOAGUE, Joseph H.	TM2(SS)	USN	USS THRESHER
HODGE, James P.	EM2	USN	USS THRESHER
HUDSON, John F.	EN2(SS)	USN	USS THRESHER
INGLIS, John P.	FN	USNR	USS THRESHER
JOHNSON, Brawner G.	FTG1(SS)-P2	USN	USS THRESHER
JOHNSON, Edward A.	ENCA(SS)	USN	USS THRESHER
JOHNSON, Richard L.	RMSA	USN	USS THRESHER
JOHNSON, Robert E.	TMC(SS)-P1	USN	USS THRESHER
JOHNSON, Thomas B.	ET1(SS)-P2	USN	USS THRESHER
JONES, Richard W.	EM2(SS)	USN	USS THRESHER
KALUZA, Edmund J., Jr.	SOS2(SS)-P1	USN	USS THRESHER
KANTZ, Thomas C.	ETR2(SS)	USN	USS THRESHER
KEARNEY, Robert D.	MM3	USN	USS THRESHER
KEILER, Ronald D.	IC2(SS)-P2	USN	USS THRESHER
KIESECKER, George J.	MM2(SS)-P2	USN	USS THRESHER
KLIER, Billy M.	EN1(SS)-P2	USN	USS THRESHER
KRONER, George R.	CS3	USN	USS THRESHER
LANOUETTE, Norman G.	QM1(SS)	USN	USS THRESHER
LAVOIE, Wayne W.	YN1(SS)	USN	USS THRESHER
MABRY, Templeman N., Jr.	EN2(SS)-P2	USN	USS THRESHER
MANN, Richard H., Jr.	IC2(SS)	USN	USS THRESHER
MARULLO, Julius F., Jr.	QM1(SS)	USN	USS THRESHER
MC CLELLAND, Douglas R.	EM2(SS)	USN	USS THRESHER
MC CORD, Donald J.	MM1(SS)-P2	USN	USS THRESHER
MC DONOUGH, Karl P.	TM3(SS)	USN	USS THRESHER
MIDDLETON, Sidney L.	MM1(SS)-P2	USN	USS THRESHER
MUISE, Ronald A.	CS2	USN	USS THRESHER
MUSSELWHITE, James A.	ETN2(SS)-P2	USN	USS THRESHER

(b) (6)

NAULT, Donald E.	CS1(SS)		USN	USS THRESHER
NOONIS, Walter J.	RMC(SS)		USN	USS THRESHER
NORRIS, John D.	ET1(SS)-P2		USN	USS THRESHER
OETTING, Chesley C.	EM2-P2		USN	USS THRESHER
PENNINGTON, Roscoe C.	EMCA(SS)-P2		USN	USS THRESHER
PETERS, James G.	EMCS-P2		USN	USS THRESHER
PHILLIPPI, James F.	SOS2(SS)		USN	USS THRESHER
PHILPUT, Dan A.	EN2(SS)-P2		USN	USS THRESHER
PODWELL, Richard (n)	MM2-P2		USN	USS THRESHER
REGAN, John S.	MM1(SS)-P2		USN	USS THRESHER
RITCHIE, James P.	RM2		USN	USS THRESHER
ROBISON, Pervis (n), Jr.	SN		USN	USS THRESHER
ROUNTREE, Glenn A.	QM2(SS)		USN	USS THRESHER
RUSHETSKI, Anthony A.	ETN2		USN	USS THRESHER
SCHIEWE, James M.	EM1(SS)-P2		USN	USS THRESHER
SHAFER, Benjamin N.	EMCM(SS)-P2		USN	USS THRESHER
SHAFER, John D.	EMCS(SS)-P2		USN	USS THRESHER
SHIMKO, Joseph T.	MM1-P2		USN	USS THRESHER
SHOTWELL, Burnett M.	ETRSN		USN	USS THRESHER
SINNETT, Alan D.	FTG2(SS)		USN	USS THRESHER
SMITH, William H., Jr.	BT1-P2		USN	USS THRESHER
SOLOMON, Ronald H.	EM1-P2		USN	USS THRESHER
STEINEL, Robert E.	SO1(SS)-P1		USN	USS THRESHER
SNIDER, James L.	MM1		USN	USS THRESHER
VAN PELT, Rodger E.	IC1(SS)-P2		USN	USS THRESHER
WASEL, David A.	RMSN		USN	USS THRESHER
WALSKI, Joseph A.	RM1(SS)-P1		USN	USS THRESHER
WIGGINS, Charles L.	FTG1-P2		USN	USS THRESHER
WISE, Donald E.	MMCA(SS)-P2		USN	USS THRESHER
WOLFE, Ronald E.	QMSN(SS)		USN	USS THRESHER
ZWEIFEL, Jay H.	EM2-P1		USN	USS THRESHER

(b) (6)

ALLEN, Philip H.	LCDR	1400	USN	PORTSMOUTH NAVAL SHIPYARD
BILLINGS, John H.	LCDR	1400	USN	PORTSMOUTH NAVAL SHIPYARD
BIEDERMAN, Robert D.	LT	1400	USN	PORTSMOUTH NAVAL SHIPYARD

(b) (6) PRESCOTT. Robert D. — Civilian Employee, Design Division, Portsmouth Naval Shipyard

(b) (6) CHARRON, Robert E. — Civilian Employee, Design Division, Portsmouth Naval Shipyard

(b) (6) GUERETTE, Paul A. — Civilian Employee, Design Division, Portsmouth Naval Shipyard

(b) (6) FISHER, Richard K. — Civilian Employee, Design Division, Portsmouth Naval Shipyard

(b) (6) WHITTEN. Laurence E. — Civilian Employee,Combat Systems Division, Portsmouth Naval Shipyard

(b) (6) BEAL. Daniel W., Jr. — Civilian Employee, Combat Systems Division, Portsmouth Naval Shipyard

DES JARDINS, Richard R. (b) (6)	Civilian Employee, Combat Systems Division, Portsmouth Naval Shipyard
CRITCHLEY, Kenneth J. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
CURRIER, Paul C. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
ABRAMS, Fred P. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
PALMER, Franklin J. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
DINEEN, George J. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
MOREAU, Henry C. (b) (6)	Civilian Employee, Production Department, Portsmouth Naval Shipyard
CORCORAN, Kenneth R. (b) (6)	Contractor's Representative, Sperry Corporation
JAQUAY, Maurice F. (b) (6)	Contractor's Representative, Raytheon Corporation
KEUSTER, Donald W. (b) (6)	Contractor's Representative, Sperry Corporation
STADTMULLER, Donald T. (b) (6)	Contractor's Representative, Sperry Corporation

5. That the persons listed as being on board were military members of the naval service on active duty, civilian employees of the Portsmouth Naval Shipyard or civilian employees of activities under Government contract, as indicated.

6. That all persons on board THRESHER were on board for the purpose of executing official duties.

7. That U.S.S. Skylark (ASR20), under command of Lieutenant Commander Stanley HECKER, (b) (6) 1100, U.S. Navy, was designated to act as escort to THRESHER during sea trials, pursuant to orders of Commander Submarine Flotilla TWO. Commanding Officer, THRESHER, was Officer in Tactical Command.

8. That THRESHER's movement orders were CONFIDENTIAL; SKYLARK's were unclassified. Sea trial agenda, issued by Commanding Officer, THRESHER, were unclassified and were not held by SKYLARK. (U)

9. That THRESHER effected a rendezvous with SKYLARK at about 0949R on 9 April 1963 in the vicinity of Latitude 42-56 North, Longitude 70-26 West.

10. That on completion of a scheduled shallow dive, the two ships proceeded independently during the night to a second rendezvous in the vicinity of Latitude 41-46 North, Longitude 65-03 West. During the transit, THRESHER proceeded surfaced and submerged and conducted various test evolutions, including full power propulsion.

11. That at 0745R, 10 April 1963, SKYLARK was in the vicinity of Latitude 41-46 North, Longitude 65-03 West, and THRESHER reported to her that SKYLARK bore 147° True, 3400 yards from THRESHER.

12. That UQC (underwater telephone) provided the means of voice communication between the ships when THRESHER was submerged. SKYLARK was fitted with QHB-A type sonar equipment, having a maximum range scale of 3750 yards, but did not have sonar contact on THRESHER at any time on 10 April 1963. (U)

13. That SKYLARK carried a rescue chamber with a maximum depth capability of 850 feet.

14. That the sea was calm, with a slight swell, at 0900R on 10 April. Wind was from 015° True at seven knots. Depth of water in this area is about 8500 feet. Visibility was about ten miles. No other ships are known to have been in the vicinity.

15. That at 0747R, THRESHER reported by underwater telephone that she was starting a deep dive. Depth for this dive had been set at b(1) . (U) SKYLARK then maintained her approximate position. THRESHER reported course changes and depth changes, but SKYLARK did not plot THRESHER's position.

16. That the deep dive appeared to SKYLARK personnel to proceed satisfactorily until about 0913R, when THRESHER reported to SKYLARK to the effect, "Experiencing minor difficulties. Have positive up angle. Am attempting to blow. Will keep you informed."

17. That at about 0916R, SKYLARK heard a garbled transmission which was believed to contain the words "... test depth". An additional garbled transmission was received about 0917R, reported as containing the words "... nine hundred North". (U)

18. That Commander Oceanographic Systems Atlantic obtained information that THRESHER's main coolant pumps ceased functioning in "FAST mode" of operation at 0911R, and that a high energy, low frequency noise disturbance of the type which could have been made by an implosion emanated from THRESHER at 0918.1R. There were also indications of two disturbances, one extending from 0909.8R to 0911.3R, the other from 0913.5R to 0914R, which could have been made by the blowing of the ballast tanks. (U)

19. THRESHER was lost at sea with all on board at about 0918R on 10 April 1963, in the vicinity of Latitude 41-45 North, Longitude 65-00 West.

20. Bureau of Naval Personnel message 121935Z of April 1963 reported that determination had been made on 11 April 1963 under the Missing Persons Act (Title 50 Appendix, U.S. Code Annotated, section 1005), that all persons on board the U.S.S. THRESHER on 10 April 1963, died on 10 April 1963.

21. That there was no evidence of sabotage or enemy action in connection with the loss of THRESHER.

22. That upon receipt of the communication from THRESHER at 0913R, "Experiencing minor difficulty..." etc., SKYLARK initiated the following actions:

a. Advised THRESHER that the area was clear.

b. Advised THRESHER of SKYLARK's course and requested range and bearing from THRESHER.

c. Asked THRESHER at about 0915R, "Are you in control?" and repeated this query.

d. Established LORAN position (logged at 0921R as 41-45N 64-59W).

e. Attempted to establish communication by underwater telephone, sonar and radio.

f. At 1040R commenced dropping series of hand grenades indicating to THRESHER that she should surface.

23. That at about 1045R, SKYLARK began preparation of a message reporting the loss of contact with THRESHER.

a. At about 0940R, when the Operations Officer had asked the Commanding Officer if he should send such a message, the reply was to the effect that, "It is too early."

b. At about 1045R, the Commanding Officer, SKYLARK directed the Operations Officer to initiate the message.

c. Although SKYLARK had conducted radio communication checks with NBL (Radio New London) earlier on the morning of 10 April, difficulty was reported at the time of transmission of the message. SKYLARK shifted to an alternate frequency.

d. NBL receipted for the message at 1245R.

24. That SKYLARK's message, 101604Z, stated, "UNABLE TO COMMUNICATE WITH THRESHER SINCE 0917R. HAVE BEEN CALLING BY UQC VOICE AND CW QHB CW EVERY MINUTE EXPLOSIVE SIGNALS EVERY 10 MINS WITH NO SUCCESS. LAST TRANSMISSION RECD WAS GARBLED. INDICATED THRESHER WAS APPROACHING TEST DEPTH. MY PRESENT POSITION 41-43N 64-57W CONDUCTING EXPANDING SEARCH."

25. SKYLARK message 101604Z did not convey to operational commanders the full extent of the information available.

a. Although inclusion of additional information such as the 0913R UQC transmission "Experiencing minor difficulty..." etc., was suggested by the Operations Officer, the Commanding Officer decided not to include such information.

b. SKYLARK did not include such additional information in any subsequent reports.

26. That on 10 April 1963, Commander Submarine Force, U. S. Atlantic Fleet (Vice Admiral E. W. Grenfell, USN) was in Annapolis, Maryland, in a duty status, delivering a submarine presentation. His administrative headquarters remained in Norfolk, Virginia. Vice Admiral Grenfell returned to Norfolk at about 1420R. At 1435R he was advised of THRESHER's status.

27. That on 10 April 1963, Deputy Commander Submarine Force, U. S. Atlantic Fleet (Rear Admiral L. P. Ramage, USN) was en route to New London, Connecticut from Key West, Florida. He had been conducting an inspection of units at Key West. He arrived at Trumbull Airport, Groton, Connecticut, at about 1830R. He proceeded by helicopter to Newport, Rhode Island and embarked in the U.S.S. Blandy to proceed to the scene of the search.

28. That on 12 April 1963, the Court of Inquiry requested that SKYLARK witnesses and records be made available as soon as possible to acquaint the court with the details of the last transmission from THRESHER and the best knowledge of her last known movements.

a. Deputy Commander Submarine Force, U. S. Atlantic Fleet, was relieved as search force commander (CTG 89.7) by Commander Submarine Development Group TWO at about 1630R on 12 April. Lieutenant (jg) James D. Watson, USN, Navigator of SKYLARK, two enlisted men, and necessary SKYLARK logs were transferred to BLANDY for return to Newport to permit appearance before the Court of Inquiry.

b. Shortly after the transfer to BLANDY, Rear Admiral Ramage interviewed Lieutenant (jg) Watson and examined the UQC (underwater telephone) log. Upon seeing the UQC log, Rear Admiral Ramage became knowledgeable for the first time of the last communications from THRESHER. This information had not previously been communicated to him or to anyone outside SKYLARK.

c. Rear Admiral Ramage advised Commander Submarine Force, U. S. Atlantic Fleet by message of the substance of the last UQC transmissions.

d. This information from SKYLARK was made known to the Court of Inquiry in testimony on 13 April 1963.

29. That shortly after 0917R, when efforts to communicate with THRESHER had been unsuccessful, SKYLARK commenced an expanding search pattern. The QHB-A sonar was the principal means of underwater detection available to SKYLARK.

30. That SKYLARK was joined in the search area by patrol aircraft and by the U.S.S. Recovery (ARS-43) during the afternoon.

31. That at about 1730R, RECOVERY sighted an oil slick about seven miles to the Southeast of SKYLARK's 0917R position.

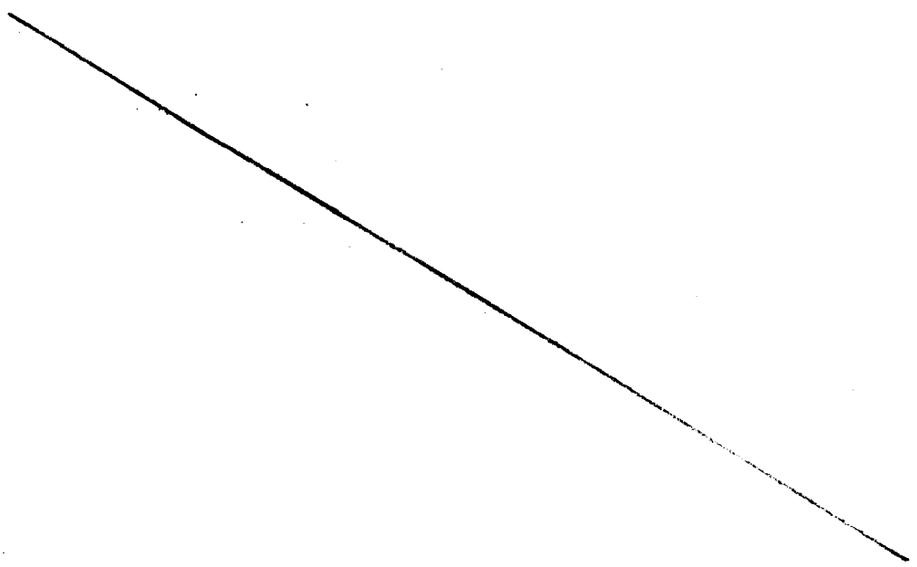
32. That samples were collected and articles of debris were recovered. These items and debris subsequently recovered were examined by laboratory personnel of the Portsmouth Naval Shipyard and were determined to be materials which could have come from THRESHER.

33. That radiation measurements were taken in the search area by surface ships and submerged submarines. Water samples and the recovered debris were examined by laboratory personnel. No radioactivity beyond normal background level was found to exist in the search area or in any of the material examined.

34. That additional ships and aircraft were employed in the search effort. Command of the search force passed from Commanding Officer, SKYLARK, to Commander Submarine Development Group TWO at about 0530R on 11 April 1963, and was subsequently exercised, for varying and consecutive periods, by Deputy Commander Submarine Force, U. S. Atlantic Fleet, Commander Submarine Development Group TWO and Commander Submarine Squadron EIGHT.

35. That while operating as a unit of the search force, the U.S.S. Seawolf (SSN575) recorded possible electronic emissions and underwater noises. None of the signals which SEAWOLF received equated with anything that could have been originated by human beings. (U)

36. That Naval units and personnel were assisted by civilian scientists and research ships. The search for THRESHER is continuing.



Unclassified

37. That THRESHER was designed by the Bureau of Ships, assisted by Portsmouth Naval Shipyard in contract design phase (1957-1958); working plans were developed by Portsmouth Naval Shipyard (1958-1959).

38. That Portsmouth Naval Shipyard built THRESHER, starting in 1958. Initial sea trials were held on 30 April 1961 to 2 May 1961, but were aborted at b(1) by instrumentation deficiencies. Severe water hammer was experienced, resulting in an extensive program of hydraulic shock and impulse tests on trim and drain and auxiliary sea water systems. Special operating procedures were prescribed for the trim and drain system. The next sea trial, fully instrumented, commenced on 22 May 1961, was fully successful, and the hull stresses measured confirmed stresses predicted by earlier model tests. (U)

39. That there were several design reviews of THRESHER Class during the building period. The Chief of Naval Operations review in March, 1959, was one such review.

40. That THRESHER was commissioned and delivered on 3 August 1961; the condition of the ship was defined by the certificates of condition furnished by the Commander, Portsmouth Naval Shipyard and the report of the Board of Inspection and Survey. In general, the ship was built in accordance with specifications and was in generally good material condition.

41. That HY-80 steel has been used in the construction of all nuclear submarines, including THRESHER, since the streamlined single screw hull was adopted. Nuclear submarines make many more excursions to test depth than battery submarines have made in the past. This increased number of cycles and the paucity of knowledge in the fatigue strength of HY-80 require periodic surveillance of submarine hulls. (U)

42. That THRESHER's main propulsion plant consisted of a model S5W nuclear power plant. (U)

43. That silver braze joints and flexible hose connections were extensively used in vital piping systems throughout the ship in accordance with usual submarine building practice and the specifications.

44. That the factors of safety relative to test depth of the compartments in THRESHER were as follows:

b(1)

Engine Room . . . . . .
Auxiliary Machinery Space . . . . . .
Control Space and Reactor Compartment . . . . (U)

45. That a high pressure hydraulic system similar to those in preceding streamlined, single screw submarines, was installed in THRESHER to provide the forces required under high speed maneuvering conditions. (U)

Unclassified

46. That as compared to the SKIPJACK, the immediately preceding class of attack submarine, THRESHER had:

a. An increase in test depth from 700 feet to b(1)

b. About the same reserve buoyancy.

c. About the same high pressure air bank capacity.

d. While at test depth:

(1) A reduction in the amount of ballast which could be blown from b(1) per cent to b(1) per cent.

(2) A b(1) reduction in the rate of blowing ballast from b(1) tons per minute to b(1) tons per minute. (U)

47. That the increasing operating depths of submarines has compressed the time available in which to take effective damage control action with respect to flooding. The shortness of time available to control flooding is not well recognized. The table below indicates, for THRESHER, in tons per minute, the rates at which water can enter through a leak, the maximum rate at which it can be discharged by drain pump or by blowing tanks, and the ratio of maximum rates of taking in water to getting rid of it.

Depth in Feet	Flooding Rate Size Hole Inches 2"	/ 4"	Discharge Rate Drain Pump	/ Air Blow	Maximum Ratio Flooding to Discharge 2" Hole
400	6.0	24.0	1.2	15.4	.4
700	7.9	31.7	1.1	12.4	.6

b(1)

All rates in tons per minute. (U)

48. That the Bureau of Ships design criteria for air system ballast tank blow capacity is that there should be capability to blow all main ballast tanks twice at periscope depth, fire all torpedoes or other weapons, and have a remaining pressure in the banks of (b) (1) (A) There is no modification to this criteria for depth of blowing or for test depth of the ship involved. There are no requirements relative to the mechanical design of systems which would prevent the formation of blockages due to ice which may form during an extended blow. There was no provision for emergency deballasting by means other than air. Dehydrators were not installed. (U)

49. That the b(1) reducing valves in the main ballast tank blow system of THRESHER were fitted with conical mesh strainers. (U)

50. That in blowing the main ballast tanks of submarines operating at shallower depths, the tanks can be blown completely dry in a relatively short time. In blowing the tanks of submarines designed for deeper test depths, all of the air in the banks can be used without emptying

the ballast tank. This requires a sustained period of blowing. (U)

There is no requirement in the specifications for building ships to completely blow down the air banks through the main ballast tank blowing system. There have not been promulgated any test results which show as a result of such a full blow down:

a. The temperature of various components of the air blowing system.

b. The workability of components at these temperatures with frozen moisture from the air system complicating the situation.

c. The low temperature effects on the blow system piping and component materials.

d. The required air dryness to prevent icing.

Under a test required by the court, strainers in the reducers of the TINOSA were blocked and ruptured by the formation of ice in about thirty seconds. (U)

51. That the high pressure air system of THRESHER Class submarines was so designed that in event of loss of electrical power to the ballast control panel, air banks 2, 3 and 4 would automatically be shut off and air bank #1 would be opened up slowly. It takes thirty seconds to get valves fully open again; this is because of the 200 psi/sec. allowable pressure rise to prevent dieselization; thus after loss of electrical power or significant voltage drop, there is no air blowing capability for some period between 10-50 seconds. (U)

52. That all sea water system hull and stop valves in THRESHER could not be remotely operated at two separate stations using hydraulic operators, and there was no specified requirement for this capability. (U)

53. That the auxiliary sea water system in THRESHER was a high pressure system, consisting of two six-inch supply headers and two four-inch discharge headers so arranged in the ship to provide for a loop operation. (U)

54. That the Ship Information Book and working plans for THRESHER Class auxiliary sea water system call for cross connection of this system as the normal mode of operation. Under this condition it can be necessary to close sea valves in both the auxiliary machinery space and the machinery space to stop a leak in either. (U)

55. That the constant vent system in THRESHER was directly connected to the auxiliary sea water system and utilized piping, flexible hoses and flexible couplings from the various components to join them to the auxiliary sea water piping system. This cross-connected the auxiliary sea water system. (U)

56. That the normal operating mode of constant vents as set forth in the Ship Information Book and plans for THRESHER is for them to be open. (U)

57. That the specifications for building submarines do not require a low pressure auxiliary sea water system. (U)

58. That the normal operating modes of the auxiliary sea water, main sea water, air conditioning and trim and drain valves in THRESHER called for them to be fully open to reduce friction losses and noise in the systems. (U)

59. That vital electrical switchboards installed in THRESHER were protected from water dripping, but not fully from spray from below or from mechanical derangement from a water stream. (U)

60. That certain alternate and supplementing identical equipments were located in close proximity to each other. For example the two lube oil pumps for each ship's service turbogenerator set on THRESHER Class are set in a lower level pocket just to port and starboard of the centerline near Frame 81; control oil for ship's service turbogenerator throttles is supplied by these lube oil pumps. The 400-cycle motor generator sets are located in close proximity in the engine room. (U)

61. That the b(1) KW ship's service motor generator sets and their electrical switching and other connections are located in the auxiliary machinery space in close proximity. They provide for conversion of b(1) volt A. C. to b(1) volt D.C. under normal conditions of the Ship's Service turbogenerator sets providing power, or, when power is provided by the battery or the diesel generator, convert b(1) volt D.C. to b(1) volt A.C. Much of the ship's vital electrical and indicating equipment is supplied from b(1) volt A.C. sources (or transformed therefrom). (U)

62. That a casualty to BARBEL during the latter stages of THRESHER's construction, focused attention on the inadequacy of quality assurance methods employed in fabrication of silver braze joints in submarine construction by Portsmouth Naval Shipyard prior to 1961. (U)

63. That subsequent to an investigation of the BARBEL casualty, silver braze joints in THRESHER's vital systems were subjected to visual examinations, mallet tests, chemical material re-identification tests, hydrostatic tests and hydraulic pressure cycling tests.

64. That there was no extensive retrofit of silver braze joints in THRESHER.

65. That quality assurance procedures employed at Portsmouth Naval Shipyard during THRESHER's construction period, consisted in general of mechanic and line supervision, with some system tests being conducted by inspectors.

66. That hull production processes during THRESHER's building period did not include the use of all the techniques and safeguards for hull surveillance which now exist.

67. That the ultrasonic method of testing silver braze joints was not available for use during THRESHER's construction period.

68. That during THRESHER's construction, x-ray techniques were used extensively for non-destructive testing of welds, forgings and castings. Some ultrasonic testing was used to detect internal flaws in steel plates. To supplement these techniques, and wherever possible, hydrostatic pressures were applied to pressure vessels and piping systems. These test pressures were, in general, one hundred and fifty per cent of the designed working pressures. In the case of those piping systems exposed to sea pressure, this test pressure was also equal to that sea pressure expected to cause collapse of the hull. Hydrostatic pressure testing is a standard engineering technique and was the best non-destructive method of testing silver braze piping joints available at the time of THRESHER construction.

69. That the Ship Information Books (S.I.B) for THRESHER were prepared by an outside firm under subcontract from the Portsmouth Naval Shipyard; the subcontractor used an SS(N) 588 Class Ship Information Book as a guide and virtually copied large portions of it, although many systems on THRESHER were quite different. The THRESHER Ship Information Book was, accordingly, not approved by the Bureau of Ships; a temporary book was provided. The finally approved version was not available to THRESHER even at the end of the post shakedown availability. (U)

Unclassified

70. That following commissioning, THRESHER conducted operations in the Eastern Atlantic area, for the purposes of shakedown, training and evaluation.

71. That this was a much longer operating period than is normal before a post shakedown availability, and was provided because of the need to test the many new developments and equipments incorporated into THRESHER.

72. That THRESHER conducted about 40 dives to test depth b(1) during this period. (U)

73. That from 16 April 1961 to 21 May 1962 THRESHER visited the Electric Boat Division of General Dynamics Corporation, Groton, Connecticut, for instrumentation and shock hardening in preparation for scheduled shock tests.

74. That during this availability, 115 silver brazed joints in her hydraulic systems were tested by ultrasonic means. Of these, eight did not meet all requirements of then existing bonding standards. Two of these joints were replaced. The remaining six were accepted after decision by the Bureau of Ships that the existing deficiencies were not such as to warrant replacement. (U)

75. That these six joints all satisfactorily withstood the shock tests which followed. (U)

76. That during a visit to Cape Canaveral in early June, THRESHER was struck by a tug and suffered damage to the exterior plating of one of the main ballast tanks.

77. That THRESHER returned to the Electric Boat Division, where all damage was repaired.

78. That a thorough inspection revealed no damage to the pressure hull nor any damage which affected the safety of the ship.

79. That shock tests of THRESHER were conducted in the Key West area during the period 17 - 29 July 1962. (U)

80. That the shock tests involved detonation of (b) (1) (A), (b) (1) (B) (U)

(b) (1) (A), (b) (1) (B)

81. That the maximum shock factor was b(1) the hull shock lethality factor for THRESHER was calculated at thus the ratio of shock applied to that required for hull deformation of THRESHER was (b) (1) (A) (U)

82. That similar shock tests have been conducted against other submarines, including nuclear submarines. (U)

83. That the shock factor (relationship between the weight of the charge and the slant range) was slightly higher for THRESHER than for any other submarine in the earlier tests. (U)

Unclassified

84. That during THRESHER's shock tests, there was no loss of main power, and no hull rupture was suffered. (U)

85. That a number of derangements occurred to joints, fittings, bolts, rivets, straps and some machinery foundation elements. (U)

86. That although an inspection was made and damaged items were scheduled for repair during the post shakedown availability, additional items continued to become evident, even in the late stages of the availability. (U)

87. That several days after the shock tests, THRESHER made a dive to b(1) during which a minor leak was discovered in the #2 PUFFS hydrophone weld. (U)

88. That depth was limited to less than 200 feet until the post shakedown availability when the nature of the damage could be determined. (U)

89. That full power trials were conducted en route to Portsmouth, New Hampshire, for post shakedown availability.

90. That THRESHER arrived at Portsmouth 11 July 1962.

91. That the commanding officer's evaluation of the first year of operations is contained in his letter, serial 086 of 16 November 1962 (Ex. 111). (U)

a. He called THRESHER "the best ASW submarine afloat today."

b. He pointed out THRESHER's deficiencies, highlighting the following:

(1) Overly complex in many areas.

(2) Difficult to handle on surface or near surface.

(3) Vulnerability of auxiliary sea water system.

c. He stated, "In my opinion the most dangerous condition that exists in THRESHER is the danger of salt water flooding while at or near test depth."

92. That post shakedown availability commenced on 16 July 1962, with an estimate of approximately 35,000 man-days and a scheduled duration of six months.

93. That major jobs originally scheduled for post shakedown availability included hard tank stiffening, conversion of hydraulic systems from cellulube to petroleum based oil, items based on findings of the Board of Inspection and Survey, and repairs found necessary as a result of inspections to be made for shock trial damage. (U)

94. That the post shakedown availability grew by addition of new work, including a large job involving the PUFFS (Passive ranging sonar) equipment, extensive items pertaining to additional noise reduction, and other modifications. (U)

95. That THRESHER's post shakedown availability completion date was successively extended from 18 January to 15 February, to 28 February, to 30 March, to 2 April, and finally to 11 April, because of work added and the under-estimation of the effects of new and old work. The total of man-days expended was over 100,000.

96. That damage to THRESHER caused by shock tests was intensively investigated by ship's force, Bureau of Ships, and Shipyard personnel after the tests, during sound trials and transits, and on return to Portsmouth Naval Shipyard. Despite such efforts, shock damage continued to be found during the entire post shakedown availability. Of significance was the discovery of loose condenser foundation bolts in January, 1963, and a misaligned torpedo ejection pump in March, 1963. This pattern of continuing discovery of shock damage during post shakedown availability parallels that found in SKIPJACK and SKATE in similar extended availabilities after shock trials. (U)

97. That at THRESHER's arrival conference, a visual and ultrasonic surveillance of sil-braze joints 2 inches and larger in sea water systems which were unlagged and accessible was placed on a not-to-delay vessel basis. (U)

98. That by letter to the Commander, Portsmouth Naval Shipyard dated 28 August 1962, the Bureau of Ships (Exhibit 115): (U)

a. Called attention to the fact that gross failures of sil-brazed joints in vital submarine systems made it a matter of urgency to develop an inspection program for them.

b. Directed Portsmouth Naval Shipyard to "employ a minimum of at least one ultrasonic test team throughout the entire assigned post shakedown availability to examine, insofar as possible, the maximum number of sil-braze joints."

c. Requested Portsmouth Naval Shipyard to forward comments, suggestions and recommendations based on results of the tests.

99. That job orders issued for the surveillance inspection called for use of one ultrasonic test team, to test first those joints not lagged, and provided that if time permitted thereafter, lagging would be removed to permit tests of additional joints. (U)

100. That the job orders called for periodic reports of results of tests to the Planning and Estimating and Design Divisions. (U)

101. That the periodic reports of sil-braze inspections were not forwarded as requested. Condition sheets of individual defects were forwarded. (U)

102. That by 29 November 1962, 145 old joints had been ultrasonically tested in the surveillance program, with a rejection rate of 13.8 per cent. (U)

103. That the standard prescribed by the Bureau of Ships for acceptance of a sil-braze joint by ultrasonic test was 40 per cent bond, 25 per cent minimum, either land. (U)

104. That on 29 November 1962, the Quality Assurance Division reported the results of the survey of old joints to Planning and Estimating Division and requested decision as to whether lagged joints should be unlagged for testing. (U)

105. That decision was made on 4 December 1962 not to unlag and ultrasonically test additional old joints in THRESHER. This decision was known to the management personnel of the Shipyard, including the Production Officer and the Commander, who were apprised of the results of the survey. (U)

106. That a copy of this decision was furnished the Commanding Officer of THRESHER. (U)

107. That no further ultrasonic testing of old sil-braze joints was conducted pursuant to this program after 29 November 1962. (U)

108. That neither the results of the surveillance nor the decision not to proceed further with ultrasonic tests of old joints was made known to the Bureau of Ships or to anyone in the operational command line higher than the Commanding Officer of THRESHER. (U)

109. That Portsmouth Naval Shipyard management and workers exhibited a high degree of confidence in sil-braze joints in THRESHER's piping systems.

110. That the results of ultrasonic tests on sil-braze joints in SCULPIN and SKIPJACK during shipyard availabilities were as follows:

Ship	Shipyard	Approximate Date	Joints Tested	Rejected Joints
SCULPIN	Mare Island	April 1962	387	22.2%
SKIPJACK	Portsmouth	August 1962	322	22.5%

(U)

111. That prior to THRESHER's post shakedown availability, there had been reports of serious failures of sil-braze joints in BARBEL, SKATE, SNOOK, SCULPIN, ETHAN ALLEN and THRESHER. (The SKATE casualty occurred on a polar cruise at 600 feet under the ice when a 3-inch sil-braze joint parted; the BARBEL casualty was a failure of a 5-inch sil-braze joint during a dive.) (U)

112. That the approximate number of sil-braze joints in an S5W reactor equipped ship is over 3000 of 2-inch size and above in hazardous systems. (U)

113. That results of the ultrasonic tests of sil-braze joints in SKIPJACK were not reported by Portsmouth Naval Shipyard to the Bureau of Ships, Deputy Commander Submarine Force, U. S. Atlantic Fleet, or higher authority. (U)

114. That flexible hoses were replaced during THRESHER's availability in accordance with process instructions existing in the Shipyard.

115. That the process instructions did not fully define specifications for allowable twist.

116. That a training program existed for making up flexible hoses.

117. That no formal training program existed for installing flexible hoses.

118. That some flexible hoses were twisted in initial installation, but were corrected.

119. That an inspection program for flexible hose installations existed and was carried out.

120. That a comprehensive flexible hose listing was prepared for THRESHER. This was used for quality assurance planning and inspection.

121. That some valves in THRESHER's hydraulic, auxiliary sea water and other systems were installed backwards during the post shakedown availability to permit testing of systems, some due to inadvertence and one due to an error in the ship's plans; however, all were corrected and properly installed prior to departure of the ship for sea trials.

122. That the Ship Information Book and working plans for THRESHER's auxiliary sea water system call for cross-connection of the system as the normal operating mode. Installation of new check valves in the constant vent portion of this system during the post shakedown availability made possible complete separation of the auxiliary sea water system into two loops.

123. That high pressure air and hydraulic systems require a high order of small particulate matter rejection during fabrication, installation and repair.

124. That difficulties were experienced in operating the high pressure air system, and in leakage from the reducing valves. These difficulties, which began early in the life of the ship and extended throughout the post shakedown availability, appeared to stem from the presence of minute particles in the system.

125. That the difficulties with the high pressure air valves, particularly leakage and venting, were reported as having been corrected prior to sea trials.

126. That the hull repairs, access patches and hull stiffening work was done in accordance with existing Bureau of Ships instructions and was checked by non-destructive test means as being satisfactory.

127. That the hull surveillance inspection scheduled during the post shakedown availability was completed.

128. That after the final system test of the auxiliary sea water system aft, Reserve Feed Tank No. 2 was over-pressurized on 8 March 1963. (U)

129. That the Reserve Feed Tank top was displaced one to two inches by over-pressurization and the ship's 8000 gallon-per-day distiller was also displaced. (U)

130. That the drain line and other lines mounted on the reserve feed tank top were affected by the displacement of the top. (U)

131. That the distiller was restored to its proper position and checked by visual, hydrostatic and short operational test. (U)

132. That the reserve feed tank was repaired and tested by pressure and other non-destructive tests. (U)

133. That based on a decision that no overstress problem was involved, drain and other lines on the tank top were not tested, nor were stress calculations made prior to sea trials. (U)

134. That stresses calculated after the loss of THRESHER by two separate activities indicated that stress levels on the drain and other lines mounted on the tank top were not excessive. (U)

135. That the auxiliary sea water system aft was not retested following the casualty to the reserve feed tank. (U)

136. That documentation of ship's systems, components and normal operating modes was not delivered to THRESHER by the end of her construction period. It was never made complete and accurate in all respects. (U)

137. That detailed damage control studies of flooding casualties, consequences, and recommended actions were not required by the building specifications for THRESHER. (U)

138. That the first dockside simulated operational cruise for purposes of crew training (fast cruise) was held 23-26 March 1963, and was terminated because of the large number of material deficiencies noted; the second and last "fast cruise" was begun on 31 March and satisfactorily completed on 1 April 1963.

139. That Atlantic Fleet Submarine Force Instructions did not require and THRESHER's sea trial agenda for deep dives on 10 April 1963 did not provide for, operation of sea valves at various depths prior to proceeding to test depth for the first time after her post shakedown availability. (U)

140. In the second "fast cruise", during one of the drills involving a simulated flooding casualty in the after auxiliary sea water system, it required twenty minutes to isolate a leak. This was one of the early drills. Changes had been made in the system involved during the post shakedown availability.

141. That sea valves which are operable on the surface or at shallow depth sometimes bind at deeper depths, particularly after modification or overhaul. There was no evidence to indicate that THRESHER planned to test the operation of sea valves at various intermediate depths en route to test depth on her first deep dive. There is evidence that it was planned to do this on a second scheduled dive to deep depth. (U)

142. That THRESHER was at the Sound Pier for sound trials during the period 1 April to 4 April, and in drydock from 4 April to 8 April 1963, to make repairs to torpedo door shutters and main circulating water valve MSW5. During this period liberty was granted to the crew.

143. That testing of systems was in accordance with Portsmouth Naval Shipyard Instruction 4855.2 and the substance of Portsmouth Naval Shipyard Instruction 4730.8 (of March 1963), and other applicable instructions. A comprehensive test program was conducted.

144. That the number of people in the quality assurance program in the Portsmouth Naval Shipyard has increased from 152 to 243, and the direct expenditures for the program from approximately $1,200,000 to approximately $2,800,000 in the past two years.

145. That all work undertaken by the Shipyard during THRESHER's post shakedown availability was reported as having been completed satisfactorily, and the Commanding Officer expressed his concurrence that the work was complete.

146. That Portsmouth Naval Shipyard has had an extensive training program over the past two years, expending about $1,300,000 in the Shipyard, of which the Pipe Shop (56) portion was about $400,000.

147. That during THRESHER's post shakedown availability, the total work effort performed at Portsmouth Naval Shipyard also included construction of five submarines, one submarine conversion and the overhaul and repair of five submarines; other minor ship repair work and some manufacturing work was accomplished.

148. That starting in 1962 there was a joint identification plant prepared by shipyards for new construction submarines.

149. That at the Portsmouth Naval Shipyard there is no standard method for maintaining in one place, on or near a ship, a documented status of ship's systems as regards operational status, components removed, components unusable, restrictions, etc; such a procedure is often called a "rip out" procedure. It involves authorization documents, instructions for tagging of removed components, assignment of component responsibilities, etc. (U)

150. That Portsmouth Naval Shipyard has authority to deviate from building specifications in certain areas, and is using the specifications as goals rather than requirements in certain cases.

151. That workers and management at Portsmouth Naval Shipyard are not in all cases adhering to the process and procedure documents to insure the benefits which derive from such documents. (U)

152. That Portsmouth Naval Shipyard considers the state of cleanliness of Shop 56 (Piping Shop) not adequate to permit work of requisite quality. This was confirmed by a view of the premises taken by the Court. The Shipyard is constructing "clean room" facilities for manufacture and assembly of air and hydraulic piping systems. (U)

153. That during the course of proceedings, a test demonstration for the Court of Inquiry was held in Drydock No. 2 at the Portsmouth Naval Shipyard. A stream of water was released to atmosphere at THRESHER's test depth pressure against a piece of electronic equipment. The stream produced tremendous force, spray, fog and noise.

154. That there were a number of submarine flooding casualties which preceded the loss of THRESHER. Among them were: (U)

a. THRESHER - First builder's trials - a b(3) 10 USC 130 salt water sil-braze vent line joint failed. Second builder's trials - a one inch trim system priming line failed.

b. ETHAN ALLEN - Builder's trials - electrical switchboards were sprayed, b(1) and minor fires ensued when a threaded plug blew out of a trim line priming line strainer.

c. SNOOK - First builder's trials - three grease lines passing through the after engine room bulkhead carried away. A one and one-quarter inch nipple in the high pressure air compressor cooling water discharge pulled out of a pipe boss at test depth. Subsequent inspection revealed a leaking sil-braze joint in a five-inch line.

d. ARGONAUT - Failure of a flexible hose fitting flooded after engine room.

e. CAIMAN - Failure of a four-inch flexible hose near test depth caused flooding of forward engine room.

f. BARBEL - Failure of a five-inch sil-braze joint.

g. SKATE - Failure of a b(3) 10 USC 1 sil-braze joint in the b(3) 10 USC 130 water line under ice at 600 feet.

h. NAUTILUS - Failure of a flexible coupling in the suction line to a sea water circulating pump while at test depth.

155. That the complexity of modern submarines has increased at a rapid rate. The advent of nuclear propulsion, ballistic missiles, and greatly increased speeds and operating depths has made it essential that all information affecting their safe operation be analyzed and promptly disseminated.

156. That Commander Submarine Force, U. S. Atlantic Fleet, has a system of disseminating information which affects submarine operational safety.

157. That there is at present no organization at any level within the Navy with the sole responsibility for submarine safety.

158. That submarine diving trainer equipment does not have the capability to simulate the attendant effects of large flooding and associated damage control situations for training. (U)

159. That all submarines are now restricted to a maximum depth of 500 feet. (U)

160. That during the past four years, the Navy's annual shipbuilding program has increased from approximately $2,500,000,000 to $4,500,000,000.

161. That during the past four years, the civilian personnel ceiling of the Bureau of Ships in Washington, D. C. has been reduced from 3800 to 3100.

162. That during the period from 1959 to 1963, the number of naval officers designated for Engineering Duty (ED) has declined from 1057 to about 840.

163. That the number of naval officers serving as technical and management officers in the Portsmouth Naval Shipyard has been reduced over the past few years. This is particularly serious in the Design Division where, in 1956, five Assistant Design Superintendents were assigned - none is so assigned today; and in the Shipbuilding and Repair Division, where the loss of ten qualified officers (mainly ED) in 1961 and 1962 has reduced capabilities.

164. That during recent years, the advent of the nuclear submarine has resulted in a major increase in the complexity and difficulty of submarine design, construction and maintenance.

165. That the increase in complexity of nuclear submarines has resulted in an appreciable increase in the responsibilities imposed upon their commanding officers during the construction and post shakedown availability periods.

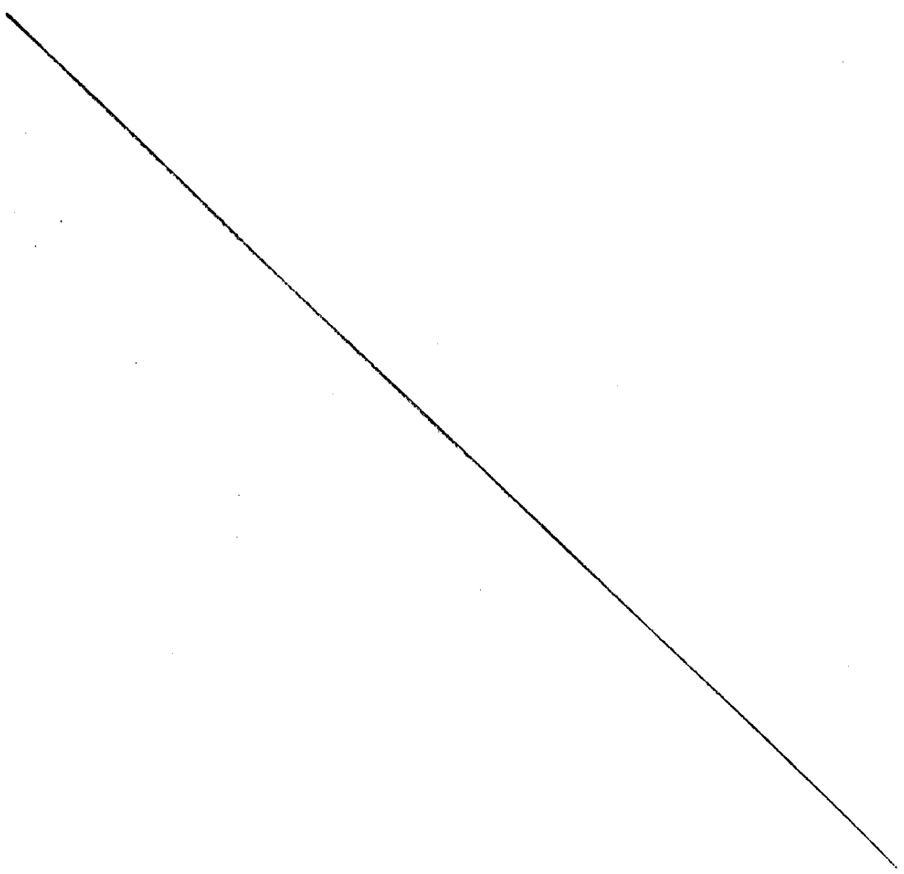
166. That the following changes of key personnel were effected during THRESHER's post shakedown availability:

a. There was a change of THRESHER's Commanding Officer in January, 1963.

b. There was a change of THRESHER's Executive Officer in January, 1963.

c. There was a change of THRESHER's Ship Superintendent in December, 1962.

d. There was a change of THRESHER's Assistant Ship Superintendent in November, 1962.



OPINIONS

1. That the loss of the U.S.S. THRESHER was in all probability due to:

   a. An initial flooding casualty from an orifice between 2" and 5" in size in the engine room, which continued, compounded by

   b. Loss of reactor power due to an electrically-induced automatic shutdown,

   c. Inadequate operating procedures with respect to minimizing the effects of a flooding casualty and the loss of reactor power, and (U)

   d. A deficient air system, susceptible to freeze-up, with low capacity and low blow rate.

2. That there is a danger that, in melding together fact and conjecture, conjecture may be stretched too far and become accepted as fact, thus narrowing the field of search for possible causes of the casualty.

3. That the fact that the court has singled out certain cases for study should not deter others, particularly members of the crews of similar ships, from continuing to study the many questions raised by the THRESHER's loss.

4. That it would be prudent to retain the current interim depth limitation now imposed upon all submarines until each individual submarine's readiness has been reassessed in regard to the factors listed in Opinion 1 above. (U)

5. That a flooding casualty in THRESHER could have resulted from:

   a. A faulty sil-braze joint.

   b. Undiscovered shock damage. (U)

   c. A flexible hose failure.

   d. A casting or piping failure.

   e. A minor hull failure.

   f. Unknowns, including component failure.

6. That loss of reactor power in THRESHER could have resulted from:

   a. Inadequate protection of electrical switchboards from salt water, particularly from below.

   b. Location of vital equipments and back-up equipments where a single casualty could inactivate both. (U)

   c. Other causes.

7. That submarine operating procedures at the time of the loss of THRESHER were inadequate, in that: (U)

a. Cross-connecting of sea water systems was excessively used, particularly at deep submergence.

b. The concept of securing salt water systems on a flooding casualty and the resulting operating limitations and capabilities had not been appropriately investigated.

c. The concept of operating main coolant pumps "in slow" with the attendant advantages was not generally appreciated and was not followed on the deep dive of THRESHER.

d. b(3) 10 USC 130

e. Pre-planned damage control actions and system isolations in order to reduce flooding control reaction time had not been fully explored.

f. Submarine Force, Atlantic Fleet Instructions did not require and THRESHER agenda for deep dives on 10 April 1963, did not provide for operation of sea valves at various depths to insure proper operation prior to proceeding to test depth for the first time after a protracted overhaul.

8. That THRESHER Class main ballast tank blow system deficiencies were found to be as follows: (U)

a. An inadequate blow rate.

b. An inadequate capacity.

c. A tendency to freeze up at line restriction points; for example, at the conical strainers in the reducing valves, and

d. A designed closing of the on-line air bank valves when electric power was lost, followed by a 10-50 second air equalizing delay time before the reserve bank is available on the line.

9. That to provide maximum safety at deep depths (700 feet and greater), all large sea water system hull and stop valves should be hydraulically operable. To provide maximum assurance of operability, sea valves should be operated from a primary station in or near a normally manned area, while hull valves should be operated from a different station, so located that a leak would not prevent access to at least one station. (U)

10. That a low pressure auxiliary sea water system (low pressure fresh or salt water) would greatly reduce the possibility of flooding at deep depths and should be provided in new construction at an early date. (The great reduction in the length of piping and hoses exposed to sea pressure would (U)

eliminate the need for considering many of the solutions proposed hereafter for the currently installed systems. Their consideration is desirable for submarines already built and under construction. A heat exchanger installation is probably the quickest way to provide a low pressure auxiliary sea water system, but other methods should be investigated.) (U)

11. That the basic auxiliary sea water loop system concept and design for the THRESHER Class is good, and is an improvement over the single header "Christmas tree" systems installed in other nuclear submarines.

12. That operation of the current auxiliary sea water system in the b(3) 10 USC 130 with remote control from a single operating station, preferably the maneuvering area, would improve overall system reliability and safety, particularly from a system isolation viewpoint; therefore, the Ship's Instruction Book and working plans for the THRESHER Class auxiliary sea water system which call b(3) 10 USC 130 should be modified at the earliest to require split plant operation as normal mode. (U)

13. That the constant vent system in the THRESHER Class is a safety hazard. (U)

14. That constant vents in submarine auxiliary sea water systems need to be closed at deep submergence to increase the safety of the ship; design of components must take this into account. (U)

15. That there were many reasons for the Bureau of Ships and Portsmouth Naval Shipyard continuing the use of sil-braze joints in piping systems of submarines. These included: years of shipbuilding practice and service, extensive tests, improvement in processes and non-destructive test techniques, the lack of weldable fittings, and the high welded-joint rejection rates in all shipyards.

16. That prior to THRESHER's post shakedown availability, there had been a sufficient number of serious failures of sil-braze piping joints in submarines to require thorough investigation by all responsible for THRESHER's safety (Fact 111) (U)

17. That there were indications of high rejection rates of sil-braze joints made in the period 1958-1961 in shipyards other than the Portsmouth Naval Shipyard (Fact 110) (U)

18. That Portsmouth Naval Shipyard did not aggressively pursue the ultrasonic inspection of sil-braze joints in THRESHER as required by the Bureau of Ships letter of 28 August 1962 (Exhibit 115). Deputy Commander Submarine Force, U.S. Atlantic Fleet did not aggressively pursue the ultrasonic inspection, nor did the Commanding Officer, THRESHER. (U)

19. That the rejection rate of 13.8% on original sil-braze joints in THRESHER was a clear indicator that additional action was required. (U)

20. That the confidence of the Portsmouth Naval Shipyard personnel in sil-braze joints was not fully warranted in the case of the auxiliary sea water, trim and drain, or air conditioning systems in THRESHER because: (U)

a. Several submarines had suffered casualties which nearly resulted in their loss. Of these, the most pertinent was the U.S.S. Barbel, which suffered a failure of a 5-inch sil-braze joint on 30 November 1960 at an approximate depth of 650 feet. (U)

b. BARBEL investigation showed inadequate quality assurance in Portsmouth Naval Shipyard sil-brazing process prior to 1961. (U)

c. There had been no extensive retrofit of high quality sil-braze joints under the improved quality developed by Portsmouth Naval Shipyard after THRESHER's initial criticality. (U)

d. Portsmouth Naval Shipyard had conducted ultrasonic tests on sil-brazed systems in SKIPJACK, finding about 22.5 per cent of joints not meeting the Bureau of Ships prescribed standards. In this case the Shipyard did not report the results to the Bureau of Ships or to Deputy Commander Submarine Force, U.S. Atlantic Fleet. (U)

e. No ultrasonic tests of original sil-braze joints in the auxiliary sea water or trim and drain systems in THRESHER had been conducted prior to the post shakedown availability.

21. That the management of the Portsmouth Naval Shipyard did not exercise good judgment in determining not to unlag pipes in order to continue the directed ultrasonic test surveillance of original sil-braze joints in THRESHER after November 1962. (U)

22. That the Bureau of Ships improvement and corrective actions regarding the sil-braze problem were not applied at the Bureau level, or in the field, with sufficient vigor in that: (U)

a. The continuing flow of information from the operating forces indicated that poor workmanship or design had resulted in inferior and unsatisfactory applications of the silver braze process; this should have resulted in more detailed investigation of the adequacy of sil-braze in hazardous systems;

b. There was insufficient inspection and audit by the Bureau of the shipbuilding and repair activities to insure that specifications were being met; and

c. The best tool for determining adequacy of sil-braze, i.e., ultrasonic inspection, was not sufficiently exploited from a coverage or timeliness basis.

23. That it appears that insofar as submarine shock tests are concerned: (U)

a. The instrumentation and inspection techniques and levels of effort utilized to date have not insured that all damage is found in the early intensive investigations of damage.

b. That more effort and instrumentation is required to insure that all damage has been found.

c. That we may have reached a point of shock factor intensity, i.e., roughly b(1) at which component and system mass interaction with the hull is a more critical consideration than pure hull lethality considerations.

d. That until the matters mentioned briefly in a., b. and c. above are more fully explored and necessary actions are taken, it would be prudent to:

(1) Limit the shock factors used in shock tests to b(1) or less.

(2) Increase considerably the level of action in arranging shock tests to provide intensive planning, calculation of effects, instrumentation and inspection before and after such tests.

24. That in view of the many potential sources of casualties and their serious consequences in high performance submarines, such as THRESHER, there is a need to re-emphasize and improve, where indicated, the quality assurance program in shipbuilding and repair yards.

25. That the quality assurance program of the Portsmouth Naval Shipyard would be improved by appropriate consideration of the following:

a. Quality Assurance Division should report directly to the Shipyard Commander.

b. Quality assurance should be engineered and planned, utilizing the statistical approach and should de-emphasize the "inspector" approach.

c. Quality assurance audits should be forwarded to management on a regular basis.

d. Quality assurance should record all defects, not just remaining defects (for example, brazers and inspectors reject joints and do not report defects found which are readily correctable. This method does not reveal to management all process deficiencies).

e. Quality assurance ultrasonic test and welding radiographic test requirements should not depend on initiation of inspection requests by pipefitters and welders, but should be separately initiated by the job order preparing authority to facilitate cross-checking.

f. A quality assurance program should be developed for flexible hose installation and checkout.

g. The Quality Assurance Division does not currently have power to disqualify workers observed to be violating procedures, process controls and normal operating instructions, but must so recommend to the shop supervision involved. It might be advisable to permit quality assurance personnel to temporarily remove qualifications (brazers' cards, etc.) under such circumstances to insure that defective work is not built into submarines during the normal administrative handling time for disqualification action.

h. Welding quality is under the Welding Engineer and is not completely integrated with the quality assurance program in the same manner as other processes are. It is believed desirable to integrate this effort.

i. Condition sheets (for defects discovered) should be reviewed, analyzed and summarized by the Quality Assurance Division for presentation to management to insure that process deficiencies are brought to management's attention.

26. That the Portsmouth Naval Shipyard attitude towards, and facilities for, minute particulate matter rejection, in general, are not conducive to delivery of high performance systems of the requisite super-cleanliness. (U) Processes of fabrication, installation and repair of such piping systems require engineering revision and facility preparation and, more importantly, personnel training to provide an adequate basis for super-cleanliness. (This is most important for high pressure air and hydraulic systems, but is applicable for other systems.)

27. That dummy valves used as spacers and valves installed backwards for tests should be so marked (tagged) and should be designated in the ship's system status or "rip out" procedure.

28. That the quality of work performed by Shop 56 (Pipe Shop) at Portsmouth Naval Shipyard has improved since the BARBEL incident, particularly in the sil-braze area and in material identification and control, workmanship and quality assurance.

29. That type commanders should be provided with the capability to evaluate hull surveillance information for each individual submarine. (U)

30. That an identification and listing program for flexible hoses, as provided by Portsmouth Naval Shipyard for THRESHER, was excellent and should be provided for all submarines. (U)

31. That the pipe joint identification program developed in 1962 by submarine new construction shipyards should be applied to earlier submarines to provide a sound basis for checking joint quality verification (U)

32. That those responsible for Submarine Ship Information Books should insure that they are completed and delivered with the ship. (U)

33. That there is a need at Portsmouth Naval Shipyard for additional detailed written repair procedures, inspection routines and quality assurance audit programs, to: (U)

a. Insure that repairs to submarines are, in fact, accomplished in accordance with the sound engineering judgment available.

b. Insure that management's policy is fully carried out.

c. Permit planned audit procedures for quality assurance to provide the high assurance of quality and safety necessary.

d. Provide the basis for management information for problem-solving.

34. That a "Ship's System Status" or "rip out" procedure is needed to maintain information on the status of the complicated systems of nuclear submarines and the division of responsibility between the submarine and the Portsmouth Naval Shipyard. (U)

35. That contract designs of submarines determine the basic operational and safety procedures; therefore, it is important that the Bureau of Ships should: (U)

a. Insure that design personnel are familiar with operational procedures,

b. Insure that there is adequate feedback of information on earlier systems from shipbuilding yards and submarine operating personnel.

c. Insure that damage control under various casualty conditions is thoroughly considered before the final system parameters are rigidly defined, and

d. Insure that design personnel become familiar with each other's problems and goals; in effect, break down the walls which apparently compartment such personnel into small areas of expertise.

36. That the basic design of THRESHER Class submarines is good, and its implementation resulted in the development of a high performance submarine. There are certain improvements desirable to increase the safety margin, as set forth in the recommendations.

37. That since high performance submarines require full quality assurance and a high degree of uniformity, the Bureau of Ships should require adherence to specifications.

38. That all submarine air system design criteria need to be reviewed for adequacy and safety. Of particular importance are the following: (U)

a. Air blow rate for main ballast tanks.

b. Air bank capacity.

c. Effect of depth.

d. Air condition as regards:

(1) Particulate matter rejection
(2) Moisture

e. Air system mechanical design for inclusion of and positioning filters, strainers and dehydrators.

f. Emergency blow capability.

g. Number of allowed pressure reductions in air system.

h. Allowable mechanical pressure reduction devices in main ballast tank normal and emergency blows.

i. Provision of internal drainage of water from air banks into the pressure hull.

j. Emergency de-ballasting by chemical gas generation or other means.

k. The fail-closed concept for the three air banks now normally carried on the line in the THRESHER Class is not desirable for safety of the ship at test depth and should be modified to provide fail-on-the-line; i.e., air bank valves open.

39. That the high pressure blow of submarine main ballast tanks needs to be tested under conditions simulating a full blow at test depth. (U)

40. That equipment locations in the THRESHER Class submarines are not so selected as to maximize resistance to damage and to facilitate control after damage; for example:

a. b(3) 10 USC 130

(U)

b. That protection from water streams and spray of the b(1) KW ship's service motor generator sets and their electrical connections in the auxiliary machinery space in the THRESHER Class submarines needs improvement. (U)

41. That electrical switchboards in the auxiliary machinery space and engine room of submarines are not sufficiently protected from water streams or spray, especially from below. (U)

42. That the deficiencies which probably caused THRESHER's loss (Opinion 1) could have been reduced by thorough and imaginative analysis and timely dissemination of all information to be had from the BARBEL and other casualties. (U)

43. That submarine diving trainers do not have sufficient capability for simulation of flooding casualties and resulting damage control action. These trainers are important, both for training of personnel and for development of operating procedures for recovery from many casualty situations. (U)

44. That there is a lack of information regarding operating procedures for submarines under varying casualty situations. (U)

45. That the following is a reasonable rationalization of probable events in THRESHER between 0909-0918.1R on 10 April 1963:

It is recognized that the specific nature of the THRESHER loss cannot be determined by assumptions and computer solutions based on those assumptions. The following analysis is made in an effort to determine the parameters of the unknown factors, such as size of leak, by utilizing known factors and the most probable variants of their interpretation as the inputs for computer solutions. It is impossible, with the information now available, to obtain a more precise determination of what actually happened.

Analysis of all of the facts available led to the conclusion that the location of a flooding casualty which might have initiated the loss of THRESHER was in the engine room.

From the many computer solutions there emerge three which bracket the probable actual situation. (U)

It is known with reasonable certainty that at 0909R the THRESHER was at test depth. At about 0910R a message from THRESHER announced a course change to 090°T from 000°T and gave no indication of any difficulty.

It is known, without much doubt, that at 0911R the main coolant pumps of THRESHER, which had been running in "FAST mode" since the start of the dive, either stopped or were slowed to "SLOW mode" of operation.

If the main coolant pumps stopped, there would have been an automatic reactor shutdown (SCRAM). This would have meant no normal main propulsion power available until after the 7.1 minutes between 0911R and time of collapse depth. There is an Emergency Propulsion Motor which could be run from the battery, but it must be unclutched from main turbine drive and the power available from this source is only sufficient for about 5 knots.

If, instead of stopping, the main coolant pumps had been shifted to "SLOW mode" and main propulsion therefore kept available, there could have been power for about b(3) knots. (U)

In Case I of the three computer solutions the assumptions were:

1. At test depth.
2. On main propulsion at about 8 knots, with main coolant pumps in "FAST mode".
3. Power lost at 0911R when pumps stop.
4. Emergency propulsion motor placed on propulsion at 0913R.
5. Blow of main ballast tanks from 0913.6 to 0914.1R.
6. Collapse at 0918.1R.

The ship trajectory curve developed by computer solution of this case showed it to be not highly probable, mainly due to the fact that the ship would have decreased depth only about 100 feet by the time the message was transmitted saying, "Experiencing minor difficulties . . ." etc.

In this case, assuming a reasonably good trim, the size of orifice through which flooding could have occurred (with .8 coefficient of discharge) would have been greater than 2" and nearer 2" than 3".

In Case II the assumptions are:

1. At test depth.
2. On main propulsion at about 8 knots, with main coolant pumps in "FAST mode".
3. On a turn with 20° right rudder and 5° down angle on the boat.
4. At 0910.5R flooding occurs and pumps ordered to "SLOW mode".
5. Full speed and 15° up angle ordered at 0911R.
6. Main propulsion power remained available at least until 0912.5R, at which time a speed of about 14.8 knots would have been reached.
7. Main ballast tank blow initiated at 0909.8R and terminated at 0911.3R.
8. Second main ballast blow began at 0913.6R and ceased at 0914.1R.
9. Collapse at 0918.1R.

Had the main turbines remained on propulsion much longer than 0912.5R with the main coolant pumps in "SLOW mode" b(3) 10 USC Max. speed), THRESHER could have surfaced with a flooding casualty due to any pipe rupture in the ship except b(3) 10 USC 130
The next smaller pipe size in THRESHER is 6" (IPS). Even a 6" size line rupture would produce excessive trim angle prior to the time of the message which indicated "minor difficulty." Main circulating water line rupture or hull rupture are dismissed as remote possibilities, since the actual hull collapse occurred at 0918.1R and would have occurred much earlier had either of these two casualties occurred, causing the change in power at 0911R.

In Case III the assumptions are: (U)

> The same as in Case II, except that both flooding and full speed with a 15° up angle occur 1.5 minutes earlier.

This is the most probable approximation of the sequence of events. The ship trajectory curve developed from a computer run with these assumptions indicates that, just prior to the sending of the "Minor difficulties ..." message at 0913R, depth would have been reduced to about 750 feet and no trouble would yet have developed in maintaining the ordered 15° up angle.

The air blows postulated in both this case and in Case II are predicated on indications on lofargrams and on the demonstrated tendency for the strainers in the air reducing valves to ice up and fail in approximately the times indicated in the assumption. Furthermore, the phrase "Am attempting to blow ..." in the 0913R message would not be inconsistent with a 90 second blow which had been interrupted by a frozen reducer at 0911.3R or an electrical failure which would have imposed a denial of main ballast tank blow capability for at least ten to fifty seconds.

Case III indicates a hole of a little more than 4".

From all of these studies, it would appear that the flooding which occurred was through a hull orifice (with coefficient of discharge of .8) larger than 2" but not much larger than 4". The corresponding pipe sizes in THRESHER's piping systems would have been between 2" and 5".

46. That manpower loading by the Shipyard in the last two weeks of THRESHER's post shakedown availability was not excessive.

47. That THRESHER's crew had adequate time for rest immediately prior to departure for sea trials.

48. That the Commanding Officer, SKYLARK, failed fully to inform higher authority of all the information available to him pertinent to the circumstances attending the last transmission received by SKYLARK from THRESHER on 10 April 1963, as it was his duty to do, for an unreasonable length of time; but that this could not conceivably have contributed in any way to the loss of THRESHER and was not materially connected therewith.

49. That although we may never learn the exact cause of the tragic loss of THRESHER, we do know enough to make it necessary for us to explore in depth the many possible causes, to the end that their correction may reduce the probability of a future submarine loss from the same cause. (U)

Some of the possible causes are in the material and operational fields and have been separately treated. Less tangible and more difficult are the possible causes that fall in the personnel field.

THRESHER was well manned by experienced officers and men. They enjoyed the respect of their contemporaries and had earned it.

Portsmouth Naval Shipyard Management and workers looked upon THRESHER as their finest creation. They were proud of her.

Yet, in conscience, the court must report that there are causes in the personnel field which may well have contributed to the loss of THRESHER, and which deserve earliest attention at the highest level.

During a period of expanding volume of work and greatly increasing technical complication in submarine construction and repair, the court finds that the numbers of specially trained, technically competent officers, in both the Bureau of Ships and in the Portsmouth Naval Shipyard, have been seriously reduced. Some of these have been replaced by civilian engineers, but the workload on the officers remaining continues to increase. This situation is seriously impairing the submarine building and repair programs.

At the Portsmouth Naval Shipyard it is resulting in a reduced level of attention to vital submarine design and operational matters which could affect safety. If the situation continues, Portsmouth Naval Shipyard could well become an unreliable and unsafe activity just at the time when the overhaul of Polaris Fleet Ballistic Missile submarines must begin.

50. That the nuclear submarine program is placing upon the Navy and the nation demands for highly qualified and trained manpower in great numbers. (U)

The Navy has established training programs to provide the officers and men to man and operate our highly complex and advanced new submarines, but urgent steps are required to attract into the submarine program and to hold the high caliber young men necessary for safe operation of our submarine force.

51. That during the overhaul and post shakedown availability periods, the responsibilities of the commanding officers of these increasingly complex submarines have become so extensive as to require a high order of technical backup from the operational chain of command. This backup is presently limited by the lack of adequate numbers of officers experienced in the operation of high speed submarines. (U)

52. That the evidence does not establish that the deaths of those embarked in THRESHER were caused by the intent, fault, negligence or inefficiency of any person or persons in the naval service or connected therewith.

53. That the substantially contemporaneous transfer of THRESHER's Commanding Officer, Executive Officer, Ship's Superintendent and Assistant Ship's Superintendent in the final portion of her post shakedown availability was not conducive to optimum completion of the work undertaken.

54. That the lessons learned from the inquiry into the loss of THRESHER are of such moment as to require wide dissemination within the Navy.

55. That the findings and opinions of this court point out numerous practices, conditions and standards which were short of those required to insure the thorough overhaul and safe operation of the U.S.S. Thresher. These same shortcomings militate against the safe construction and overhaul of all submarines at the Portsmouth Naval Shipyard and are, in varying degrees, applicable to other submarine construction and repair yards. Vigorous steps should be taken to correct them. (U)

These shortcomings have developed incident to the rapid changes in materials, workmanship and operating conditions of submarines during the last decade and to the accelerated pace of the submarine program. They can be blamed on no individual or individuals, and many would not have come to notice had THRESHER not been lost.

The responsibility for the loss of THRESHER cannot be charged to neglect or dereliction on the part of any individual or group of individuals.

RECOMMENDATIONS

1. That the interim depth restrictions now imposed upon all submarines should remain effective until careful consideration, for each individual submarine, is given to the probable factors contributing to the loss of THRESHER, as listed in Opinion 1. (U)

2. That the design of submarine sea water systems be reviewed and new construction be modified as follows:

   a. Provide a low pressure system for auxiliary sea water service.

   b. Provide remote hydraulic operation for all sea water system sea and hull valves, with the sea valves operated from a primary station in or near a normally manned area and the hull valves operated from a different station so located that a leak will not prevent access to at least one of the two stations. (U)

   c. That a loop system be provided wherever practicable, with split loop operation provided as the normal mode of operation.

   d. That the constant vent sub-system be eliminated.

3. That for THRESHER Class submarines the following be provided:

   a. Elimination of the constant vent sub-system, with substitution of internal venting by manual means.

   b. Hydraulic remote operation for hull and stop valves.

   c. Modifications to the auxiliary sea water system plans and Ship's Information Book to show split loop operation as the normal mode.

   d. Instructions in the Ship's Information Book for safe operation of the trim and drain system at deep depths, with information on valve opening and closure times.

4. That additional inspection, repair and certification of sil-braze joints for operating submarines be performed to attain an acceptable level of reliability. (U)

5. That in new submarine construction all sil-braze joints in hazardous systems above one inch in inside diameter be ultrasonically tested, certified and documented. (U)

6. That in hazardous piping systems of submarines designed to operate below 500 feet, sil-braze joints of more than two inches in inside diameter be replaced by welded joints when replacement is required. (U)

7. That for new construction submarines, welded piping joints be specified for joints of more than two inches in inside diameter in hazardous systems. (U)

8 That shock tests of nuclear submarines be deferred until such time as the Bureau of Ships has reassessed the following: (U)

a. The adequacy of instrumentation coverage and capability to insure that all damage is found shortly after the shock tests.

b. The shock resistance and mass interaction of system components and their associated piping and foundations as compared to hull resistance.

9. That shock factors not exceed approximately (b) (1) (A), (b) when tests are resumed unless the action taken pursuant to Recommendation 8 above indicates it is safe to proceed further. (U)

10. That the quality assurance program at Portsmouth Naval Shipyard be further emphasized and improved in scope along the lines indicated in this court's opinions.

11. That the Bureau of Ships require submarine shipbuilding activities to:

a. Adhere to specifications, and

b. Obtain approval of the Bureau of Ships for all waivers where this is not practicable.

12. That the Bureau of Ships increase its audit activity to insure adherence to specifications for submarine building, overhaul and repair.

13. That submarine air system design criteria be reviewed for adequacy and safety and, subsequent to such review, that the air systems be modified. (See Opinion 38) (U)

14. That in THRESHER Class submarines, the air system modifications and tests include: (U)

a. Elimination of the conical strainers in the Marotta reducing valves.

b. Test of the air systems for a full air bank blow through the main ballast tanks to insure full blowing.

c. Tests of the main ballast tank structure to determine its adequacy on a direct blow.

d. Elimination of the b(1) psi reducers as soon as the air system and ballast tanks have been proven or altered to be capable of accepting 4500 psi.

e. Provision of 4500 psi blow of main ballast tanks.

15. That increased emphasis be given to damage control considerations in the selection of locations for vital submarine equipment, and that primary and secondary sources not be located in close proximity to each other. (U)

16. That electrical switchboards of submarines be better protected from salt water. (U)

17. That submarine diving trainers be provided the capability of simulating ship reaction to flooding casualties at deep depth. (U)

18. That studies be undertaken on a high priority basis to develop submarine operating procedures which will maximize recovery possibilities under various damage control situations. The following are merely a few examples of the many circumstances which might obtain and which should be explored: (U)

b(3) 10 USC 130

19. That separate and distinct submarine operating procedures be established to govern operations under various situations of depth and speed, to include the following: (U)

a. High speed maneuvering and transit. Under this situation the submarine would operate in a depth zone which provides adequate security from cavitation, yet reserves a margin for recovery in the event of a control casualty.

b. Deep depth operations. Under this situation of excursion to extreme depths, an exceptional degree of damage control readiness should be established. Measures for nuclear submarines should include:

(1) Use of a moderate speed which is a compromise between protection against a control casualty and protection against a flooding casualty.

(2) Use of slightly positive buoyancy trim.

(3) Operation of main coolant pumps in "slow mode." Similarly, all systems should be in that mode of

operation or alignment which contributes most toward dependable operation under casualty conditions and which minimizes flooding effects.

(4) Additional manning of interior communications systems and specific detail of personnel to key isolation valves.

20. That early consideration be given to the establishment of an organization, similar to that employed in Naval Aviation, in the interest of safe submarine operating procedures. Such an organization should be responsible for the analysis of events and developments which pertain to submarine safety and the timely dissemination of such information.

BERNARD L. AUSTIN
Vice Admiral, U. S. Navy
President

LAWRENCE R. DASPIT
Rear Admiral, U. S. Navy
Member

WILLIAM C. HUSHING
Captain, U. S. Navy
Member

JAMES B. OSBORN
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NORMAN C. NASH
Captain, U. S. Navy
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BERNARD L. AUSTIN
Vice Admiral, U. S. Navy
President

SAUL KATZ
Captain, U. S. Navy
Counsel for the court

FIRST DAY

U. S. Naval Submarine Base New London,
Groton, Connecticut
Thursday, 11 April 1963

The court met at 2025 hours.

Present:

Vice Admiral Bernard L. Austin, U. S. Navy;
Rear Admiral Lawrence R. Daspit, U. S. Navy;
Captain William C. Hushing, U. S. Navy;
Captain James B. Osborn, U. S. Navy;
Captain Norman C. Nash, U. S. Navy, members;
Captain Saul Katz, U. S. Navy, counsel for the court.

The court was cleared and the counsel for the court read the appointing order, original prefixed, marked "A".

All matters preliminary to the inquiry having been determined, and the court having decided to sit with open doors, the court was opened.

The appointed reporters, (b) (6) and (b) (6) ;, civilian court reporters, the members of the court, and counsel for the court were sworn.

No witnesses not otherwise connected with the inquiry were present.

Clarence James Zurcher, Captain, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Will you state your name, grade, organization and present duty station?
A. Clarence James Zurcher, Captain, U. S. Navy, Staff, DepComSubLant.

Q. In connection with your duties on the staff, are you familiar with the circumstances of the THRESHER's departure from Portsmouth, New Hampshire on the 9th of this month?
A. Yes, I am.

Q. Would you tell me under whose command she was?
A. THRESHER was under the command of ComSubDev Group TWO, administratively; and she was operating under ComSubLantAdminPortsmouth OpOrder; and she is a unit of ComSubLant.

Q. What was her immediate background history prior to the 9th of April?
A. THRESHER, of course, is a new submarine, first of her class, and about last July she went to Portsmouth Naval Shipyard for a post shakedown availability, meaning that after the ship has been built and operated for a short period of time there are many things that should be updated, repaired, and any defects noted and taken care of at that time. This is quite an extensive job; it took quite a long time; it took until April of this year to complete the job.

Q. Were you familiar with her general material condition on the 9th of April?

A. Yes. We at DepSubLant keep thoroughly informed on material condition of these ships in the yard. In the case of THRESHER, she had a very good post shakedown availability. All the defects were corrected. There were no items which could be possibly construed as affecting the safety of the ship and everything was in good operating condition.

Q. You had some previous familiarity with that ship; was she under your command at one time, Captain?

A. I was ComSubDevGroup TWO until last summer, and at that time, prior to that time she was in the DevGroup and I had command of her as a unit of Development Group.

Q. Now are your duties on the Staff such that you are required to be familiar with her condition?

A. Yes. Under my direct supervision is the Portsmouth Material Officer and we constantly send people up to the Material Shop to check on the ships in the yard. THRESHER was one. And we always had someone up there in the Material Shop checking on the progress of the work and the quality of the work. Unfortunately, one of our material people was on board at the time THRESHER was overdue.

Q. In connection with your official duties, did you have occasion to discuss her material condition with her commanding officer recently?

A. Yes, I did. About a week prior to sailing I discussed at length the material condition of the ship with the commanding officer on the telephone. The reason that prompted my call was, I had a very fine report on the condition of the ship from one of my material officers who had just come from Portsmouth and, to corroborate the report, I discussed it with the commanding officer at length, and he was satisfied, and so was I, that everything was in top notch shape for sea. This was about a week before the sailing.

Q. Do you remember any remarks you may have made to him in inquiry as to whether there was any doubt in his mind as to whether or not his ship was ready for sea duty?

A. Affirmative, I did. And I assured him that if the ship was not ready to go to sea in any respect we wanted to know immediately and the ship was not to sail; and he agreed, and he thanked me at the time for the backing we were giving him because he did not want to go to sea if any work was uncompleted in any respect.

Q. Was any work left uncompleted by the 9th of April?

A. There was no work left uncompleted that had anything to do with the safety of the ship.

Q. On the 9th of April under what orders did the ship sail?

A. She sailed under an Operation Order issued by ComSubLantAdminPortsmouth. He is the Commanding Officer, DOGFISH, and the senior submarine officer present at Portsmouth, the direct representative of the Force Commander in the area.

Q. Is that a classified operational order?

A. The operation order was classified.

Q. Is there an unclassified version of it that you can give us?

A. Yes, I believe I can. Briefly, she was directed, when ready to proceed, on the 9th of April, to proceed to the Boston OpAreas and rendezvous with the SKYLARK. She was to conduct operations in accordance with various ComSubLant directives and run through many tests which are quite routine for submarine operations, mainly associated with just the checking of machinery, main propulsion,

and auxiliary machinery; and, on completion, and about 1600 on the 11th of April, she was to have returned to Portsmouth after having completed all her sea tests.

Q. Do you have the Operations Order with you?
A. Yes, I do.

Q. Is that it?
A. This is it.

The Operation Order (Exhibit 1) was submitted to the court and was offered in evidence by counsel for the court. After ascertaining that the document offered in evidence was an exact copy of the classified OpOrder, and there being no objection, it was received in evidence.

RPTR: This will be Exhibit 1.

Q. Captain Zurcher, on the 9th of April 1963, did THRESHER depart Portsmouth, New Hampshire, in compliance with those orders?
A. Yes, she did depart in compliance with those orders.

EXAMINATION BY THE COURT

Questions by a court member, RADM Daspit:

Q. Captain Zurcher, do you know whether she had a training period alongside the dock before she went under way on the 9th?
A. Yes, sir, she did, Admiral. She had a training period alongside the dock which amounted to about four days of training, as such, with the crew alongside the dock. There was much other training activity, of course, that went on prior to this time that was not immediately done prior to sailing.

Q. I was referring to the "fast cruise" type of operation.
A. Yes, sir, she did have routine "fast cruise" and there were no problems that arose during the fast cruise. It went off in very good shape.

Questions by the president, VADM Austin:

Q. Captain Zurcher, you stated that no work was left uncompleted which had to do with the safety of the ship. Was any work left uncompleted?
A. Yes, sir. They are mainly items of adjustment, such things as perhaps putting in lockers inside, and doing other internal adjustments which are more a matter of convenience than of operational safety. They are all a matter of convenience. There are none that are a matter of operational safety. Otherwise the ship does not sail. That is a criteria that is always used and was used in the case of THRESHER.

COUNSEL: Mr President, we are prepared to present evidence showing exactly what work was accomplished on the THRESHER.

Q. Now, Captain, you have stated that the commanding officer found the material condition top notch and the ship ready to go to sea?
A. Yes, sir.

Q. Did he have an opportunity -- or did he volunteer information regarding any personnel deficiencies?
A. He had an opportunity to volunteer this by direct question and his response was that he had all his personnel, his complement, and he was very happy with the set-up he had as far as his crew went at that time, and he sailed with a full allowance.

Q. Captain, had the THRESHER made dives subsequent to her departure on the 9th and prior to the time that she made the dive on which contact was lost with her?

A. Yes, sir. She made at least two dives prior to the time she apparently made this dive when she was lost. I don't have the direct report from the escort vessel but indications are she at least broached, if not surfaced, in between two of these short training, testing dives. She did have some new people on board and some other training was desired by the commanding officer, so he took it slowly and easily and made a couple of short dives in this manner to break people in.

Questions by a court member, CAPT Osborn:

Q. I have one other question which I think we can get over. Did THRESHER proceed from the area of shallow dives previously mentioned to the area of her deep dive submerged?

A. She proceeded essentially submerged all the way except for one short period where we believe she was broached up to the surface and still in diving condition, but it was submerged all the way essentially.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Could you describe informally for the record what a "fast cruise" is?

A. This is a period prior to sailing when the ship is "buttoned up" for going to sea, hatches shut, and so on, for going to sea, in which the crew isolates itself from outside communications except as it would operate at sea and operates all the machinery as if they were out operating underway; and it's a complete sea-going test while they are still fast to the dock. They rotate the propeller, operate all the auxiliary machinery, do everything they would underway. And that's what we term as a fast cruise.

Q. And how extensive was that operation in the case of the THRESHER?

A. The specific fast cruise performed by the THRESHER went for two days, forty-eight hours.

Q. With essentially the same crew which took her to sea thereafter?

A. Exactly the same crew, with perhaps one or two people -- I cannot vouch for the last one or two men.

Q. Captain Zurcher, are you the senior officer on the Staff for Deputy Commander Submarine Force U. S. Atlantic Fleet, present today?

A. Present today, because Admiral Ramage and Captain Beshany, the Chief of Staff, are absent. I am the third; therefore, I am the senior one at the present time.

Q. In connection with your official duties, do you have the official sailing list showing those persons embarked in THRESHER when she put to sea on 9 April?

A. Yes, I have it here.

Q. If so, produce it.

A. (The witness did so.)

COUNSEL: I offer it to the court for the purpose of introducing it in evidence.

The sailing list (Exhibit 2) was submitted to the court and was offered in evidence by counsel for the court.

COUNSEL: Mr. President, it is customary to read an exhibit in its entirety, but if the court will waive the reading of it, we can attach it to the record and abridge these proceedings.

There being no objection, it was received in evidence and the reading of it was waived.

REPORTER: This will be exhibit 2.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing else to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 2055 hours, 11 April 1963.

The court reopened at 2100 hours, 11 April 1963.

All parties to the inquiry who were present when the court closed were again present.

No witness not otherwise connected with the inquiry were present.

Captain John S. Schmidt, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Will you please state your name, grade, organization and present duty station?
A. John S. Schmidt, Captain, U. S. Navy, Commander Submarine Squadron TWO and Commander Submarine Flotilla TWO.

Q. As Commander Submarine Flotilla TWO, do you represent Commander Submarine Force, U. S. Atlantic Fleet in the New London area?
A. I do.

Q. In connection with the putting out to sea of the U.S.S. THRESHER on 9 April 1963, are you familiar with the events that transpired upon her sailing from Portsmouth, New Hampshire?
A. I believe I'm reasonably familiar with them, yes, sir.

Q. Will you please give us an account of them to the best of your knowledge and ability?
A. The THRESHER sailed from Portsmouth on the 8th of April. May I correct myself? Today is the 11th; Tuesday was the 9th; then she sailed on the 9th, under an OpOrder promulgated by COMSUBLANT (ADMIN) Portsmouth,

in company with SKYLARK, who was operating under an OpOrder promulgated by COMSUBFLOT Two, New London.

Q. What sort of a ship is the SKYLARK?
A. The SKYLARK is an ASR.

Q. Can you describe that more fully for the record?
A. A submarine rescue vessel. SKYLARK -- shall I introduce this in evidence? This is a copy of the OpOrder of the SKYLARK.

Q. Is this classified?
A. No, it is unclassified.

The COMSUBFLOT Two OpOrder (Exhibit 3) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 3.

COUNSEL: Will the witness read Exhibit 3?

The witness read Exhibit 3.

Q. Will you explain for the record just what is meant by "OTC is THRESHER"?
A. Officer in Tactical Command is THRESHER.

Q. Which put the Commanding Officer of THRESHER in command of the operations conducted under this order?
A. That is correct.

Q. During their entire scheduled operations together?
A. Yes.

Q. Will you please go on from there, sir?
A. THRESHER, of course, was operating under an Operation Order promulgated -- I gave that before. THRESHER was operating in accordance with their Special Notice 9080, dated 2 April 1963, which was from the Commanding Officer THRESHER.

Q. Do you have that with you?
A. I have that with me, and I present it here. It is unclassified.

The CO THRESHER Special Notice 9080 dated 2 April 1963 (Exhibit 4) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 4.

Q. Please read Exhibit 4, sir.
The witness read Exhibit 4.

A. I would like to point out to the court that enclosure (1) lists the events, numbers 1 through 74, with sequencing and times, and time and hours, after underway, with additional designation of phases, enroute initial dive area, enroute initial dive, second dive, enroute on surface to deep dive area, enroute submerged to deep dive area, initial deep dive, second deep dive, surfaced and submerged transit to PNSY, Portsmouth Naval Shipyard.

Q. Captain, you say the sequencing of events contained in this exhibit is based upon the time at which THRESHER got underway. Can you tell us the time she got underway?

A. That I cannot tell you.

Q. Please tell us in your own words your knowledge of the events which occurred upon the commencement of those operations?

A. My personal knowledge of the events that occurred after the commencement of operations is limited to that part of the operations with which I became immediately aware, a report from SKYLARK, during the deep dive sequence of the events, the initial deep dive sequence of events, in which SKYLARK reported she had lost communications with THRESHER. In explanation I would like to say that once the OpOrder was issued, the responsibility lay with the ships involved to make the rendezvous as directed and carry out the operation without further orders, and without further reporting to me directly.

Q. What was the first word you heard thereafter, Captain?

A. I want to correct my former statement, to say that I had a report from THRESHER, which was at 091417Z.

Q. Produce it.

A. This is her departure report from Portsmouth.

COUNSEL: I offer it to the court for the purpose of introducing it in evidence. This is unclassified, also. If there is no objection, the reporter will mark this exhibit 5.

The CO, USS THRESHER message 091417Z (Exhibit 5) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 5.

Q. Do you have a chart which shows the reference point mentioned in Exhibit 5?

A. This is U.S. Coast and Geodetic Survey Chart No.71. On it is the position -- May I check this against another chart, if the court will permit? 2KR, area one, it's right in Portsmouth Harbor. We will need a higher chart to show buoy 2KR.

Q. Now you started discussing this first chart, and if there is no objection from the court we will offer this in evidence.

The U.S. Coast and Geodetic Survey Chart No.71 (Exhibit 6) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 6.

Q. Can you follow the course of THRESHER on Exhibit 6?

A. My information on the course of THRESHER on exhibit 6 is limited to information which I received from SKYLARK after I had received her initial message indicating loss of communications during the first deep dive. I went

to SKYLARK with an inquiry as to the point of the initial dive, the latitude and longitude and time of the initial dive. This coincided with her first dive back here; I'm pointing to the chart where she dived initially after leaving Portsmouth. This is the SKYLARK's stated position with THRESHER at that time. It was given to me on the 10th of April, a day after this dive was made.

COUNSEL: Let the record show that the witness indicated a point marked on Exhibit 5 with capital letter "A".

Q. You stated you received a report from SKYLARK. Do you have that report?
A. I have that report; it is this message.

The CO USS SKYLARK message 101604Z (Exhibit 7) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 7.

COUNSEL: Please read exhibit 7.

Exhibit 7 was read by the witness.

Q. For the purpose of a plain spoken record, and quoting from the message "Unable to communicate with THRESHER since 0917R". Can you tell us in terms of Eastern Standard Time what 0917R is?
A. Yes, 0917R is 9:17 a.m. Eastern Standard Time.

Q. What action was taken upon receipt of that message?
A. Various actions were taken. In the first place I would like to point out that that message was received in my office at 1304. I would also like to call attention to the fact that the date time group when it was sent was 101604Z, which would make it 1104R, or 11:04 a.m. Standard Time. I received it at 1:04 P.M., two hours later. At that point I immediately notified, two minutes later I had notified, Commander Submarine Force, Atlantic Fleet by telephone, normally referred to as "Hot Line", direct.

Q. I would interrupt to ask the witness to ensure that the testimony he gives in open court will be unclassified. If it is necessary for you to give classified information, please so indicate first.

The witness continued with his answer.

A. At that time, in conversation with the Operations Officer at SUBLANT in Norfolk, I did several things. One was to check ships which could be diverted to assist SKYLARK in reestablishing contact with THRESHER. Ships which were diverted were SEA WOLF (SS(N)575), SKYLARK, excuse me, SUNBIRD, another submarine rescue vessel, both of which --- and U.S.S. SEA OWL (SS405) all of who were operating about sixty to eighty miles south of New London and approximately three hundred miles from SKYLARK. The exact distance can be shown by chart if necessary. Another action was to request -- after perusing rather closely the schedule of events for test dives, Exhibit 4, and needing information from SKYLARK as to the point of initial dive, and trying to decipher and determine where in the schedule of events THRESHER should be at that particular time when she was with SKYLARK and reported lost contact. This was the gist of the thing. I sent the following message to SKYLARK, in which I requested initial point of dive, initial course and speed of THRESHER, and position of last contact.

Q. Do you have the message?
A. I have.

Q. This is unclassified?
A. Unclassified.

COUNSEL: I offer it to the court for the purpose of introducing it in evidence.

The COMSUBRON TWO/COMSUBFLOT TWO message 109040Z to U.S.S. SKYLARK (Exhibit 8) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

REPORTER: This will be Exhibit 8.

Q. Please read Exhibit 8.
The witness read exhibit 8.

A. The message doesn't show it, and I want to add this for the court's information. While it was on the circuit I added to (e) "and state of sea". SKYLARK's answer will show that, I'm sure. In response to that message I received the following message.

COUNSEL: If there is no objection I should like to offer this message from the SKYLARK in evidence.

The CO, U.S.S. SKYLARK message 102109Z (Exhibit 9) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

Q. Please read Exhibit 9.
The witness read Exhibit 9.

A. That position, of course, is laid out on Exhibit 6, and the various positions are measured. I would make one further--I would invite the court's attention to this course and these positions given by SKYLARK. They indicate an actual speed of about 13.9 knots for that period of time. That was overnight. Tuesday at 1422R, that's Standard Time, until early next morning.

Q. To interject here, Exhibit 5 reported THRESHER's departure from Buoy 2KR Portsmouth. I show you this chart; can you identify it?
A. Coast and Geodetic Chart 1206.

Q. Does this chart show the location of Buoy 2KR in Portsmouth Harbor?
A. Buoy 2KR is shown at the entrance to Portsmouth Harbor, with an arrow marked "A".

The Coast and Geodetic Chart 1206 (Exhibit 10) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

REPORTER: This will be Exhibit 10.

Q. What action was taken upon receipt of the reply to your message?

A. I would point out that this message was received in my office at 1627, local time. There had been much going on in the way of conversations between COMSUBLANT in Norfolk and myself, between Portsmouth COMSUBLANT (ADMIN), Portsmouth, New Hampshire, and myself, trying to establish the events which were taking place at the time of the loss of contact with THRESHER. We concluded that it was during the phase of the initial deep dive, at a time which, as nearly as we could tell, was within an hour of the completion of the deep dive, at which time the schedule indicated that THRESHER intended to surface and check various equipment listed in exhibit 4, for results of the deep pressures.

Q. You are referring to exhibit 4, the "Sea Trial Agenda?".

A. Exactly.

Q. Can you tell the court how you arrived at the conclusion as to the time and phase of the agenda at which the last contact occurred?

A. Well, primarily from the fact that she had moved from shallow water to deep water which would give her the opportunity to make the deep dives. Secondarily, from the report of SKYLARK, which indicated that she was approaching test depths, and thirdly, from the order of events and the time elapsed, which would indicate the approximate time on the schedule which she was keeping.

Q. What action was taken then?

A. By that time we had started to receive additional assistance from the efforts of CINCLANTFLT. It was indicated that the DLG, U.S.S. NORFOLK was available to us in Newport. I asked for a helicopter to come from Quonset to New London to pick up COMSUBDEVGRP Two, who I intended to send in NORFOLK to search as SAR Commander.

Q. Would you please state in full what SAR Commander abbreviates?

A. Search and Rescue Commander. Additionally I dispatched and engaged a taxi aircraft from Trumbull Airport to carry a representative, Commander (b) (6) ;, from COMSUBDEVGRP Two to Portsmouth to assist on the Portsmouth correlation of this in the search and rescue efforts. Having the DEVGROUP and the Flotilla's representatives in that area. This was accomplished. I was notified by CINCLANTFLT, by CRUDESLANT, that there was a division of destroyers, DESRON 24, available in Newport. The time on this and sequence is not exactly as I have related, but these are the events which were taking place. By approximately 1800, local time, I was informed that the Secretary of the Navy had been informed and he desired a flag officer on the scene. I had been getting situation reports initially half hourly, and then at COMSUBLANT's direction, every fifteen minutes, from SKYLARK, indicating that they were having no further success and the situation was unchanged. Admiral Ramage, DEPCOMSUBLANT was designated. He at the time was enroute from Key West to New London. He arrived in New London about 1845. At that time I had a helicopter awaiting his presence and delivered him to Quonset Point and to DESRON 24. He went aboard BLANDY, the destroyer BLANDY, and proceeded to the Op area about 2030 local time. I would invite the court's attention to the fact that at this point, or in connection with the actions that were being taken, and in accordance with CINCLANTFLT 1-62 Op Order, a submarine which is in distress and needs search and rescue operations, which lies north of 39° north and outside of the three hundred fathom curve, is a responsibility, for the search and rescue operations, of Commander Eastern Sea Frontier, with Commander Submarine Force, Atlantic Fleet acting as his direct agent in prosecuting the

the rescue operations. At about this point, when Admiral Ramage was designated, COMSUBLANT ostensibly took over the operations and coordinated them with CINCLANT-FLT through DESLANT, and by direct single side band communication with SKYLARK. Not SKYLARK, but at this point U.S.S. RECOVERY, an ARS, a tug, which initially had been some twenty miles from the original point of lost contact of SKYLARK and THRESHER, had been vectored over and his communication equipment was of big assistance in keeping COMSUBLANT cut in on the situation. For the rest of the evening COMSUBLANT took over and was getting fifteen minute situation reports, all of which were practically "no change" until chronologically within about a half hour after RECOVERY joined SKYLARK at the point of operations, she encountered, and this was about 1800, 1600 -- I'll have to find the message. I received the following message.

COUNSEL: I request this message be received in evidence.

The CO, U.S.S. SKYLARK message 102230Z was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 11.

COUNSEL: Please read exhibit 11.
The witness read exhibit 11.

Q. What is the next pertinent information concerning the search?
A. This message indicates the change of Op control. The next pertinent message is this one.

COUNSEL: I offer it in evidence as exhibit 12.

The CO, U.S.S. SKYLARK message 102245Z (Exhibit 12) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 12.

The witness read exhibit 12.

Q. What was the next significant event?
A. The next message of importance is this one.

COUNSEL: I offer it in evidence and request that it be marked exhibit 13.

The CO, U.S.S. SKYLARK message 102315Z (Exhibit 13) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 13.

Q. Please read exhibit 13.
The witness read exhibit 13.

Q. Is that location marked on exhibit 6?

A. It is marked on exhibit 6. On the far right side close to the intersection of heavy vertical and horizontal lines. From that time on, from SITREP 9 fifteen minutes later, approximately, there is no change essentially for the rest of the night. SKYLARK and RECOVERY remained searching in the vicinity of lost contact during the night.

COUNSEL: I would like to introduce SITREP 11 from SKYLARK.

The CO, U.S.S. SKYLARK message 110030Z (Exhibit 14) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 14.

Q. All of these messages are unclassified, are they not?

A. Yes, all unclassified.

Q. Please read exhibit 14.

The witness read exhibit 14.

A. This was SKYLARK making the search. That is about where I bowed out of the operational position and became a bystander. I think I have filled in the essentials.

Q. In connection with your account of the methods employed in the search and rescue operations, have you given us a complete account of all ships engaged in the operation up to the point of your narrative?

A. My recollection -- I'm not sure, but my account should have covered in resume the following ships in the search and rescue plan that were diverted: The SKYLARK, initial point, RECOVERY, joined, the SUNBIRD, the SEA WOLF and the SEA OWL were diverted from other Op areas.

Q. Those are submarines?

A. No, two submarines and one ASR. I have mentioned all of those before. COMDESRON 24 with four of his ships, and there were BLANDY, WARRINGTON, S. B. ROBERTS and W.R. LIND, The SULLIVANS, the YARNELL. Those ships, and then the NORFOLK, who carried COMSUBDEVGRP Two. That's a DL. Those were all the ships that were involved.

Q. In addition to the ships which were involved in the search and rescue operations, were aircraft also employed?

A. Yes, almost immediately after getting SKYLARK's initial report, COMFAIRWING Three, at Brunswick, Maine, was contacted and aircraft were requested to assist in air search at the point of last contact. He diverted an aircraft which was on another mission within a half hour from the point of last contact. That plane was over within a half hour and assisting in the search. They laid on three other aircraft in conjunction and in cooperation with COMFAIR Quonset Point. Between the two of them they had four aircraft of the P2V type on station in the search area until midnight. One aircraft from midnight till dawn and four aircraft after dawn again laid on and have been searching all day in conjunction with the surface forces.

Q. Have there been any further positive results from the search to this moment?

A. I have a recollection that there was another report from RECOVERY. She had sighted an additional small amount of debris as before, and SKYLARK -- she had each recovered some from the sea. This material, in addition to that previously collected, was later put aboard the DD ROBERTS and sent back to Newport, where I believe, it should be arriving shortly, and will probably be sent to Submarine Base New London, or this area, for analysis, including samples of oil slick.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. The tests themselves, as I recall, and I wish to clarify this for the record, were conducted under COMSUBLANT (ADMIN) Portsmouth, under his OpOrder, in accordance with his OpOrder?

A. Now the command setup is such that he is responsible for providing an escort, a sonar equipped escort for this operation. In the event he can find none available, then I take over the responsibility as COMSUBFLT Two in providing it. Because of this and because there was not a ship available in the Boston area at that time, I provided the ASR SKYLARK.

Q. You entered the operation actually, actively, when the search phase began?

A. That is correct.

Questions by VADM Austin:

Q. Captain, during the night was the decision taken to advise next of kin of the probable loss of the submarine?

A. Yes, Admiral. At about 1830, or let's say it became rather evident to us that something serious may have happened, when we were informed first and noted in the plan that THRESHER had intended to surface after her deep dive to check out other equipment at the surface, also there was the oil slick with some debris. In face of those two things we suspected that something serious had happened. At that point I asked SUBDEVGRP Two to get the next of kin lists altogether to make sure that the sailing list was correct, that we had for record. Actually, Admiral, in doing this, I think this is pertinent, the plane that took their representative to Portsmouth brought back a copy of the latest sailing list, so that we had one in New London. This arrived at New London at about 1830. At 1900 COMSUBLANT, Admiral Grenfell, personally told me that at 1930 we in the New London and Portsmouth areas were to commence notifying the next of kin of those people listed on the sailing list that the THRESHER was overdue, we had not been able to communicate with her since morning and that we would keep them informed of anything new that we found out. We did this, commencing at 1930.

Q. About what time did you complete this?

A. It took us, Admiral, about four and a half hours to complete this. The majority of the list, I would say, of the hundred and twenty-nine involved I think all but about twenty-five had been notified within the first two hours. At 2000, I think, CNO released, Admiral Anderson, made a television release on this and a radio release.

REDIRECT-EXAMINATION

Questions by counsel for the court:

Q. I show you exhibit 2, the sailing list, do you recognize it?
A. Yes, I recognize it.

Q. The list is composed of a list of names of naval officers and men and is followed by a list of civilians. Does the list of officers and enlisted men comprise naval personnel, officers and crew, embarked in THRESHER on April 9-10, 1963?
A. To the best of my knowledge, it does.

Q. And the list of civilian persons at the end of it represents authorized civilian personnel from the Portsmouth Naval Shipyard who were on board in connection with their duties?
A. It represents a list of those persons who were aboard. I do not personally vouch for their authorization.

There were no further questions.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

Admiral, I have one other item that I think may be pertient. At 2400 on the 10th, local time, at the direction of Admiral Grenfell, COMSUBLANT, we started a second notification of all the listed next of kin, in which we told them that we had heard nothing more from THRESHER, had not established communication, and in our opinion our hopes were rather dim that there would be any survivors. This list of notification was completed rather quickly in the first two hours up to about ten people who were still hangovers from the first list, and finally all were contacted by eight o'clock this morning.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court recessed at 2205 hours, 11 April 1963.

The court opened at 2225 hours, 11 April 1963.

All persons connected with the court who were present when the court recessed were again present.

No witnesses not otherwise connected with the inquiry were present.

(b) (6), Commander, U.S. Navy, was called as a witness for the court, advised of his rights under Article 31, duly sworn, informed of the subject matter of the inquiry, and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station?
A. (b) (6) Commander, USN, Staff of ComSubDevGroup Two, sir.

Q. What is your position on the Staff, Commander?
A. Chief Staff Officer to ComSubDevGroup Two.

Q. In connection with your official duties, have you received a communication from Commander, Portsmouth Naval Shipyard listing the civilian employees of the shipyard who were on board the THRESHER at the time of her departure on 9 April from Portsmouth?
A. The list was prepared by Portsmouth Naval Shipyard, sir. It arrived in the same envelope sent to me by the Executive Officer of USS THRESHER with the ship's company sailing list, sir.

Q. If you have it, produce it.
A. (The witness did so.)

COUNSEL: I offer it to the court for the purpose of introducing it in evidence to establish the status of the civilians on board. I request the reporter to mark it Exhibit 15.

The sailing list (Exhibit 15) was submitted to the court and was offered in evidence by counsel for the court.

There being no objection, it was received in evidence.

RPTR: This will be Exhibit 15.

COUNSEL: With the permission of the court, we will dispense with the reading of Exhibit 15 at this time.

PRESIDENT: Very well.

Q. I show you Exhibit 2, a sailing list already introduced in evidence before this court; have you had occasion to compare Exhibit 15 with Exhibit 2?
A. Yes, sir, I have.

Q. With respect to the list of civilian names, are they completely identical?
A. Their names do check on the two lists, sir.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

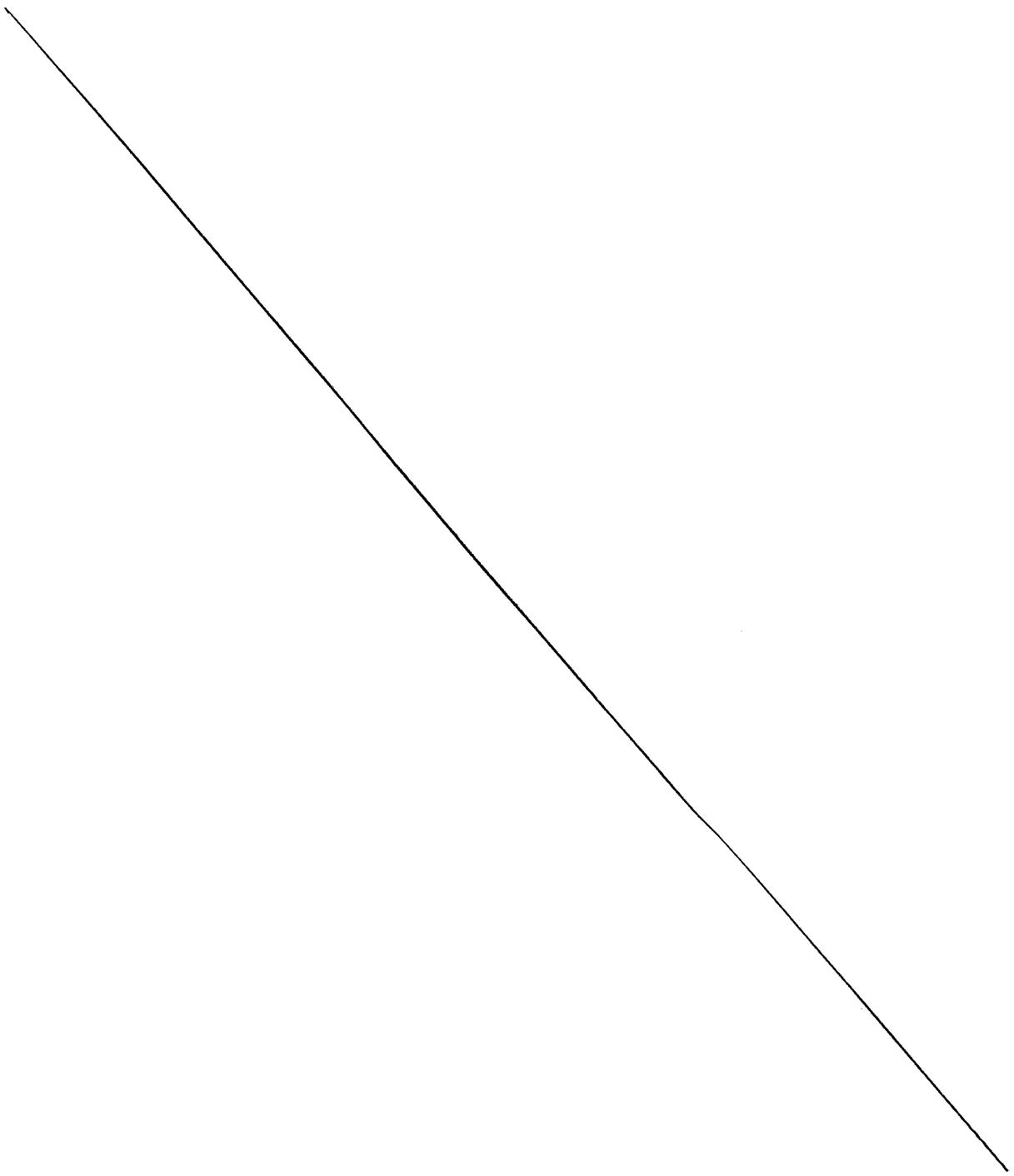
The witness stated that he had nothing further to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

COUNSEL: I have no further witnesses to call at this time.

PRESIDENT: There being no further witnesses to call at this time, and it being a late hour, the court will adjourn to meet at 1000, 12 April 1963.

The court adjourned at 2232 hours, 11 April 1963.



SECOND DAY

U. S. Naval Submarine Base New London,
Groton, Connecticut
Friday, April 12, 1963

The court met at 1000.

All persons connected with the court who were present when the court adjourned were again present in court.

Mr. (b) (6) was introduced as reporter and was duly sworn.

The court was cleared at 1002.

The court was opened at 1135.

The president announced that the court would adjourn to meet at the Portsmouth Naval Shipyard, Portsmouth, New Hampshire, as soon as practicable.

The court adjourned at 1140.

THIRD DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Saturday, April 13, 1963

The court met at 0900.

All persons connected with the court who were present when the court adjourned were again present in court, except Mr. (b) (6) [illegible] (b) (6) was the reporter.

Dean L. Axene, Commander, U.S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station.
A. Dean Lane Axene, Commander, U.S. Navy. I am not presently assigned to any duty station but am on leave in the area with my family, prior to reporting to my next assigned duty station, which will be as prospective Commanding Officer of the JOHN C. CALHOUN.

Q. Commander Axene, you are the former Commanding Officer of THRESHER, are you not?
A. Yes, sir.

Q. Will you give us a brief resume of your naval service?
A. I graduated from the Naval Academy with the Class of 1945, graduating in June of '44. I entered into the submarine service immediately, and have had almost nineteen years of submarine experience. I don't think it necessary to enumerate all of the duties which I have had. I think probably the more significant duty stations to which I have been assigned are the following. My first experience with nuclear power occurred when I was assigned as the Executive Officer of the NAUTILUS. I first put her in commission and served on her for a while after she was commissioned. My previous command experience was as commanding officer of the U.S.S. CROAKER. CROAKER is a conventional submarine, configured as an SSK, a submarine killer. I think probably also is pertinent that I served as head of the nuclear department of the Submarine School for a period slightly more than two years and all the nuclear training given to submarine personnel at the Submarine School came under my direction. Also, I spent one year under Admiral Rickover in Washington in training for my duty as Commanding Officer of the THRESHER.

Q. When did you first report for duty in THRESHER?
A. I reported here at the Portsmouth Naval Shipyard on 1 June 1960. The ship, of course, at that time was not yet launched, but I and the key personnel in the commissioning detail arrived here in the shipyard at that time to commence our organization and training for the manning of THRESHER when she was completed. We were here for a period of almost a year before the ship was completed and commissioned, and then I served as her Commanding Officer from commissioning until I was relieved by Lieutenant Commander Harvey on 18 January of this year.

Q. THRESHER then was built at the U.S. Naval Shipyard, Portsmouth, New Hampshire?

A. Yes, sir.

Q. Please give the court a brief resume of the history of THRESHER during your tour of duty as Commanding Officer.

A. THRESHER was commissioned on the 3rd of August 1961. Prior to commissioning we had, of course, conducted all of the builder's trials of the ship, both alongside and underway. Also, the preliminary acceptance trials for the Board of Inspection and Survey were required prior to the commissioning. The underway trials of the ship were just preceding commissioning and were conducted in the late Spring or early Summer of 1961. Following commissioning, THRESHER, to the best of my recollection, spent a period of seven weeks at sea conducting operations which centered about an evaluation of the noise quieting features of the vessel. Everyone was most anxious to find out just how well this had been done, and conducted rather extensive sound tests in the Bahamas area, took part in some minor fleet exercises, conducted our torpedo tube acceptance trials at Newport, Rhode Island.

Q. When was that done?

A. I remember the THRESHER was in Newport over Labor Day of 1961 and I believe the actual torpedo tube acceptance trials occurred just after Labor Day. THRESHER returned to the shipyard, I believe, in October of '61 for a regularly assigned upkeep period. It was assigned here at the yard at my request because virtually all of the families of the ship lived in this area.

Q. With regard to her initial sea trials, Commander, relate the events which occurred?

A. The initial trials of THRESHER at sea were essentially the same as conducted in any new submarine, the first of a class. I think probably the most significant thing about THRESHER's trials was the deep dives. The ship was the first of a deeper diving class of submarines built by our Navy, and was the prototype, the lead ship of this new class. THRESHER made the first deeper dive which was, of course, fully implemented and conducted under controlled conditions.

Q. I would request the witness to bear in mind that if in his judgment his reply to any question put by counsel or by the court would necessitate the giving of classified information that instead of giving the reply the witness not answer the question and inform the court of his reason.

A. Yes, sir.

Q. Now, with regard to the sea trials, you say THRESHER, like all lead ships of a class--was THRESHER the first ship of her class?

A. Yes.

Q. And in general terms, what class of ship is that?

A. Well, it's generally known as the THRESHER class; it is a new class of attack submarine which evolved from the SKIPJACK class, which was the preceding attack nuclear attack submarine. I would like, if I may, to say the builders trials were designed, and are always designed, to thoroughly check out the ship as it is possible to do. We conducted full power runs to test the main machinery; we conducted full power runs to test torpedo battery, on what we call "water slugs" and also dummy torpedoes, operated all of the electronic equipment to check out its operations. In general, we checked out everything that was possible to check out to insure that the ship had been built properly and would operate properly.

Q. In connection with her initial test dives, would you describe the events which attended test dives?

A. I would like to say that the THRESHER's initial deep dive was conducted under virtually identical conditions with the dive on which she apparently was lost. It was almost in the identical area. We were escorted by a submarine rescue vessel; I don't remember which it was, but I think it even may have been the SKYLARK. I mentioned earlier that this initial deep dive was a fully instrumented dive. The hull of THRESHER was covered with strain gauges which would measure the strain the hull experienced when we made the dive. There were other instruments that measured the hull deflection and experienced the pressure that the ship was subjected to. This trial was under the technical direction of the David Taylor Model Basin; they are located near Washington, D.C. They are a government laboratory under the Bureau of Ships. There were responsible people from the Bureau of Ships and the Shipyard and COMSUBLANT on board the ship. Admiral Moore, I remember, and particularly the deputy chief of the Bureau were on board for this dive. And it was made, as I say, under very controlled conditions. We went down in increments, stopping not only to check for leaks, but to check the readings of the instruments I have mentioned and, as a matter of fact, before we attained the designed test depth of the ship on that initial deep dive, we reached a point where the instruments indicated that something was wrong. The readings were somewhat contradictory and it appeared that we might be approaching the limit of the strength of the hull. As a result, that first deep dive was terminated before reaching designed test depth and the ship returned to the Portsmouth Naval Shipyard for thorough investigation of exactly what the situation was.

Q. Did you report the fact that you had aborted that test dive?

A. I feel certain that I did, although I don't remember any specific communications. We must have; there was a change in our plans and I'm sure that the technical people wanted their officials ashore to know what the situation was.

Q. Upon your return to port what were you able to find out?

A. Well, it became obvious almost immediately that the trouble was not with the ship; it was with the instrumentation. Instrumentation had been installed for a rather long period of time and in the latter stages of construction some of it had been damaged; some of it had deteriorated and the readings simply were not valid. The instrumentation was put back in first class condition, the ship returned to sea on a subsequent trial and did successfully complete the dive to designed test depth.

Q. Now, was that a "first" in the Navy?

A. Yes, it was.

Q. In what respect?

A. As I said earlier, the THRESHER is a new deeper diving type of submarine and no one, to the best of my knowledge, had ever been to the depths that THRESHER was designed to achieve until we did it.

Q. Were there any significant deficiencies shown in that first successful deep dive?

A. Not associated with the test dive itself, no. You always turn up what we call weak minor deficiencies during the builder's sea trials. This is one of the main reasons why you conduct them, and during a period subsequent to the underway trials at the shipyard all of these were corrected--all that weren't deliberately scheduled for later accomplishments, for instance, during the post-shakedown availability.

Q. Then at the end of this successful deep dive you had approached the end of the preliminary acceptance trials--is that right?

A. The preliminary acceptance trial is a special set of trials conducted for the Board of Inspection and Survey.

Q. Would you describe that board, please?

A. Well, the Board of Inspection and Survey is a board of line naval officers that work for the Chief of Naval Operations. It is their responsibility to see that the ships that are constructed and prepared for the Navy are constructed properly and repaired properly. To this end they inspect all new ships, and we were required to perform for them a selected set of trials and in fact it was almost a direct repeat of the shipbuilder's underway trials. We did essentially everything that we had done for the shipbuilder again for the Board of Inspection and Survey.

Q. Can you give us a generalized description of those tests?

A. Well, they again included full power runs on machinery, dives to test depth, operation of the ship's armament, electronic equipment; essentially exactly the same as we had donefor the builder's trials.

Q. Now, you said dives to test depths; do you mean by that term to include what you previously referred to as the deep dives?

A. Yes.

Q. And those were repeated for the board?

A. Yes, several times. After the first instrumented dive was successfully completed and the builders and designers have all the data they derived from the instrumentation, and it is determined that the dive was successful, that there were no weak places in the ship, then the ship is free to go to its designed test depths at any time it sees fit. We, of course, did go on many occasions during normal operations.

Q. And after those preliminary acceptance trials, then the ship was commissioned?

A. The preliminary acceptance trials showed some deficiencies in the ship but she was--it was felt by the Board of Survey that she met with her designed specifications sufficiently well so that she could be preliminarily accepted by the Navy and placed in commission. This, as I said, was done on the 3rd of August 1961.

Q. What activities were engaged in following her commissioning?

A. As I briefly said earlier, the first set of operations centered about sound tests of the ship to determine how well the noise quieting features of the ship accomplished their intent. These trials were conducted principally in the Bahamas area. We took part in a fleet exercise, a rather minor one.

Q. Was there a shakedown cruise after commissioning?

A. May I refer to some notes? I have been trying to clarify in my own mind the exact sequence of the operations that THRESHER did during her first year in operation, and I must admit that it is a little bit hazy in my recollection. Of course, the ship's logs were submitted to the Bureau and should you want this precisely, the information is available.

COUNSEL: You may refresh your recollection but do not put your notes into evidence. Testify as to your own knowledge after refreshing your memory.

The witness continued:

A. These are rough notes. To the best of my recollection, our shakedown cruise occurred following this October upkeep at Portsmouth Naval Shipyard, which, as I said, followed a period of about seven weeks of operations, principally sound-testing the ship. Now we did have a shakedown cruise that lasted three weeks, but as I say, to the best of my recollection this occurred in October of '61, late October.

Q. Now what is the purpose of a shakedown cruise after commissioning?

A. A shakedown cruise, a shakedown training period is assigned to the ship to give the ship an opportunity to adequately train its crew, to prepare it for employment as a fleet unit. Up until this time we had had little opportunity to operate with other ships, to exercise the ship at battle stations, under anything other than purely simulated conditions, and the period in our case, at least, was devoted primarily to training ourselves to shoot torpedoes.

Q. Now that's an important time in the life of a ship and the life of a commanding officer on a ship. How did you evaluate your ship and crew at that time?

A. We were still learning at that time; there's no question about that, but I think we learned an awful lot during that three-week period, and I think that some of the subsequent exercises in which we took part in which we actually fired exercise torpedoes bore out the fact that we had a well-trained ship, at least as far as her ability to use her weapons.

Q. Following that period of shakedown, what were your next operations?

A. Shakedown cruise was the first portion of a period of operations that lasted for a period of about nine weeks. The shakedown portion lasted for three weeks. We then spent some time at Fort Lauderdale, Florida, principally shooting some dummy "SUBROC" weapons. Now, "SUBROC" stands for submarine rockets. They are a relatively new antisubmarine weapon which THRESHER was going to be able to handle. These tests at Fort Lauderdale were principally to help the people that are developing the SUBROCS to see that the weapon was indeed compatible with the ship. These were not actually SUBROC weapons; they were dummy shaped and only that.

Q. These were not special trials; what the Bureau of Ships call special trials?

A. No, the Bureau of Ships special trials were conducted during this same nine-week operating period. These were conducted at Cape Canaveral and enroute back up to New England.

Q. What is the nature of those trials?

A. BUSHIPS special trials are again conducted by the lead ship of any new class. The most familiar portion of them would be, I believe, the standardization trials during which you find out exactly what speed the ship can make, what her turning diameter is under varying speeds: things of that nature. The Bureau of Ships special trials also included maneuvering trials, emergency recovery trials, air conditioning trials. Those were the major ones that THRESHER conducted, as I recall.

Q. In these trials which you are describing, how did THRESHER perform?

A. In general, I would say admirably. We turned up no major deficiencies and none in the area of safety, the area in which I presume you are principally interested.

Q. During these cruises you have mentioned and trials, did you dive the ship in deep dives from time to time?

A. Yes, indeed. It was my objective to put the ship to test depth approximately every other day, mostly for the training of the crew, to increase their confidence in the ship and to keep it high. I, personally, am a firm believer in not operating submarines at their designed test depths unnecessarily, nor for long periods of time unnecessarily. Nevertheless, we did, on many occasions, operate the ship at test depths.

Q. And during the same period of time did you operate submerged for extensive periods?

A. Oh, certainly. As I'm sure you are all aware, nuclear submarines are much more at home submerged than they are on the surface. As a matter of fact, THRESHER was a most uncomfortable ship on the surface, in anything other than a flat calm sea, and we ordinarily submerged as soon as we were clear of whatever harbor we were leaving from and stayed submerged until we were ready to enter another one.

Q. And on these trips, Portsmouth, New London, Fort Lauderdale, etc., you transitted, you made those cruises chiefly submerged?

A. Invariably, yes.

Q. I believe in point of time the last time you testified to was the visit of the ship to Fort Lauderdale in connection with a test firing program. Before arriving at Fort Lauderdale, had the ship had an opportunity to participate in fleet exercises?

A. Yes, as I again mentioned earlier, we took part in a nuclear submarine exercise, an exercise which involved several nuclear submarines off New London. As I recall, just prior to the October upkeep here at Portsmouth. This was an exercise that lasted for approximately a week. It was an advanced exercise but one that did not require too much in the way of ship training before conducting. In other words, it wasn't as advanced an exercise as one in which a submarine operated with a carrier task force, for instance; fairly elementary exercise, but it was a fleet exercise with other fleet units.

Q. She did participate as a full fleet unit with other operating submarines?

A. Yes, sir.

Q. Then after Fort Lauderdale where did THRESHER operate?

A. We conducted our BUSHIPS special trials off Cape Canaveral and while enroute back north. This took us into the month of December of 1961, and we actually returned here to the Portsmouth Naval Shipyard for our Christmas leave and upkeep period here at Portsmouth. Again, this was done not because of any particular work needed on the ship, but at my request because the families of the people on the ship lived in this area. The homeport at this time was New London, but we knew that sooner or later we would have to have a post shakedown availability here and most of us kept our families here, expecting to move on the completion of the full shakedown availability.

Q. What do you mean by post shakedown availability?

A. Every new ship has a period set aside in her schedule, at the building shipyard normally, for correction of those defects which the ship's company turns up in some period of operation, during which we have the chance to check the ship out at their own leisure and in their own way, and this period is assigned so that valid deficiencies that have turned up in the ship can be corrected by the ship's builder before final acceptance by the Navy.

Q. So crew members settled in this area because a regularly scheduled post shakedown availability would normally be conducted here?
A. That is correct.

Q. Now, how long then was she in port in Portsmouth over the Christmas holiday?
A. As I remember, about six or seven weeks. I think we got here about the middle of December, and I'm sure that we left early in February, near the first of February, on our next phase of operations.

Q. In port was there any major work performed during that period?
A. There were items of work accomplished, yes. You ask "major"; I honestly do not recall the work that was conducted at that time, but I do believe we got a new type of radio antenna, and that was a fairly major job.

Q. Were there any major work orders directly affecting the safety of the ship?
A. To the best of my recollection, no. As I say, all during the early operations of the ship we turned up nothing that really affected the safety of the ship.

Q. Then it was about the first of February that you actually put to sea again?
A. Yes.

Q. And what operations were conducted at that time?
A. We operated in and out of New London during the next ensuing operating period, which was probably in the order of six to eight weeks; I don't really recall. We conducted an assortment of operations. I recall that we did some work in evaluating the new sonar equipment which THRESHER had on board. We did take part in another fleet exercise, I recall.

Q. Can you describe that exercise for us?
A. It was another one similar to the one we participated in in the Fall, involving several nuclear submarines. This one, however, THRESHER's part was somewhat longer in duration and more involved. It was a more advanced exercise.

Q. More demanding on the ship and crew?
A. Yes.

Q. And how did she account for herself in this exercise?
A. I feel, quite well. The reports of those exercises are, of course, available.

Q. Was it during this period of time, perhaps in February or early March, that you demonstrated the ship to the Anti-Submarine Warfare Council?
A. Yes, prior to that, however, the ship was again in the shipyard. This time at the Electric Boat Division of General Dynamics in Groton for a special availability that lasted for about one month, during which time the ship was prepared for and instrumented for a series of trials which were scheduled for late May or early June. Following that availability we did take the ASW Council for a demonstration ride. The ship was given its first operational readiness inspection, and I might include that the grade on that inspection was "Excellent," if it has any bearing on your inquiry.

Q. Describe the nature and significance of an operational readiness inspection.

A. An operation readiness inspection is an inspection given by someone higher up than the fleet chain of command periodically, to determine the readiness of each fleet unit. This was THRESHER's first operational readiness inspection. It was conducted by the Commander Submarine Development Group Two. It lasted for a period of three days while the ship was enroute from Newport, Rhode Island, where we disembarked the ASW Council, to Charleston, South Carolina, where we conducted some tests and Public Information type cruises for people at Charleston. An operation and readiness inspection in general requires the ship to perform everything that it is supposed to be able to perform. All sorts of drills, fire drills, flooding drills, loss of the reactor plant, snorkeling, firing weapons, and really that's the principal part of the ORI, the ship's ability to shoot and hit something.

Q. Your reference to the loss of the power plant referred to a simulated loss, didn't it?

A. No, we actually took the plant off the line and then recovered from that condition. This is a routine drill that we conduct all the time. Exercises of that kind designed to show the operational commander that that unit of the fleet is up to snuff as far as he is concerned.

Q. And ready for any demands that may be put?

A. Ready for war, basically.

Q. And the results of that inspection?

A. As I say, the ship received a mark of Excellent overall; there were grades on each phase of the inspection and, again, I don't recall them all. The report, I'm sure, is available.

Q. Now you've referred to demonstration of the ship to the ASW Council; will you explain that term to us and describe the demonstration?

A. THRESHER was designed to be an antisubmarine submarine. Everything that the Navy could build into her to further that end was built into her. The fleet exercises I alluded to earlier were exercises that permitted us to try out our ability in using this ship to fight other submarines. The ASW Council rode the ship to see for themselves on the spot how well we were able to accomplish this.

Q. The ASW Council, will you explain that to us?

A. I'm not sure that I am fully knowledgeable in this area. I'm sure that some of the members of the board are. However, my belief is that the ASW Council, Anti-Submarine Warfare Council, was established by either the Chief of Naval Personnel, or the Secretary of the Navy, I'm not sure which, to study the Navy's ASW capabilities, and to make recommendations as to what avenues appeared to be most fruitful for the Navy to follow in the future. The nuclear anti-submarine attack submarines, such as THRESHER, was one of these avenues and we explored it on THRESHER.

Q. What were the nature of the exercises?

A. The exercise was one in which we were given an area south of New London and a target, which was a snorkel conventional type submarine. Our job was to detect the submarine, conduct an attack on her. As a matter of fact, an attack and a re-attack. This was the principal phase of the demonstration. Following that, we did have a small demonstration of the ship's ability to maneuver, and we did, as a matter of interest, take her down to test depths. We then delivered them in Newport, Rhode Island, where they were to observe some other aspects of the Navy's ASW efforts.

Q. Her performance during that period then was completely satisfactory?
A. Outstanding: I believe the Council felt the same way.

Q. Now it was after that, then, that you visited Charleston, South Carolina?
A. That's correct.

Q. And after Charleston what ensued?
A. THRESHER was first assigned to take part in the Presidential Naval Review which was conducted off North Carolina. We did in fact take part in a rehearsal for that review, but all submarines were canceled out of the actual review, so we did not take part in them. This period of operations, however, did include another visit to Fort Lauderdale for some additional firings, such as I mentioned earlier, and some operations again off Cape Canaveral.

Q. And your work at Fort Lauderdale included a visit to Cape Canaveral; is that correct?
A. That is correct.

Q. Did a significant incident occur during that period?
A. It was while the ship was making its berth at Cape Canaveral that we were struck by one of the assisting tugboats and a small, well, fairly good-sized hole was put in one of our main ballast tanks. THRESHER was actually in the harbor laying to off the pier and these two tugboats were being used to push her alongside. THRESHER was not a maneuverable ship in close waters. She always needed and always used tugs to help her both moor and get underway. Coming alongside one of the tugs ordered a backing bell and received an ahead bell, after which she struck THRESHER on the port side forward and holed one of the main ballast tanks.

Q. Did that incident materially affect her hull integrity?
A. None whatsoever. The damage was of nuisance value but very superficial. Under ordinary circumstances I think we would have continued to operate with the hole in that ballast tank until it was convenient to have it repaired.

Q. Could she dive with the hole in her ballast tank?
A. She could and did. As a matter of fact, we were directed to have the damage repaired immediately and we were ordered back to the Electric Boat plant in order to have this damage repaired.

Q. The Electric Boat Company?
A. The Electric Boat Division in New London, and we made the transit from Cape Canaveral to New London submerged.

Q. How long a period was spent at New London?
A. A period of three days, as I recall. They said the damage was quite superficial. It required cutting out a small piece of the nonpressure hull, the boundary of one of the ballast tanks, and welding in a new piece.

Q. Following the repairs at New London, did you return to the Key West area?
A. Yes. As I said, under ordinary circumstances I don't think we would have taken time at this stage of the game to repair this damage. However THRESHER was scheduled and had previously been prepared for a series of shock acoustical trials, which were to be conducted in the Bahamas-Key West Area. We certainly wanted the ship to be in tip-top shape for those trials, and because of this the repairs were ordered and made before these trials were conducted.

Q. Then at the end of those repairs were you satisfied that she was in tip-top condition?

A. Yes, indeed, and I might go further and say that the results of those trials proved this.

Q. Did those trials include tests for maneuvering control reliability, salt water piping integrity?

A. Well, not primarily. The purpose of the trials were really twofold. Again, ships are periodically tested by the Navy for the ability to withstand shock: the type that they are subjected to in battle. Well, I should say these trials were conducted on pressure primarily because she is the first of a large class of similar submarines and we wanted to know very much how the class would stand up under shock. The secondary phase of this test was to determine what effect shock would have on the various characteristics of the ship, so primarily were testing for resistance to shock and making sound test to determine the effect.

Q. Following those tests did you return to Portsmouth?

A. Yes, that is correct. These tests which were conducted at Key West were the last scheduled operations prior to the start of the assigned and scheduled shakedown availability here at Portsmouth. We returned here and the PSA, as I recall, started on the 16th of July.

Q. When you say PSA, you are referring to post shakedown availability?

A. Yes, sir, post shakedown availability.

Q. Prior to the commencement of that period of availability, did you engage in any activities in connection with dependents?

A. Yes, we made two dependents' cruises in one day before the start of the post shakedown availability. As I recall, THRESHER actually returned to Portsmouth on the 11th of July. It was two or three days later that we were able to take dependents out on the ship. We took a group out from Portsmouth, exchanged them for a second group just outside the harbor and took that group out for a demonstration, and then brought them into port that evening. This was the last operation that the ship took part in prior to the post shakedown availability.

Q. Now the period of post shakedown availability in Portsmouth then was a regularly scheduled period?

A. Yes.

Q. And you have already testified that it was anticipated at much earlier date?

A. The post shakedown availability for THRESHER was delayed, actually at my specific request. Admiral Daspit may recall this because he was the Deputy Commander Submarine Force at the time. I wanted to make sure that we had plenty of time to evaluate THRESHER before we came in for the post shakedown availability. As a result, the ship actually operated for about a year before the post shakedown availability. This is longer than is usually the case.

Q. I think that your last testimony was that the period of operation prior to the regularly scheduled post shakedown availability was prolonged at your request in order that you might fully evaluate the ship; is that correct?

A. That is correct. There was no doubt in my mind that we were ready enough, or more than enough, for technical tests and trials. I was a little concerned that we were not getting enough time to operationally evaluate the ship, and this was the reason why I requested a delay, or an extended period of operations, prior to starting the post shakedown availability, and I think that had we not done this, deliberately delay the post shakedown availability, THRESHER might not have had the opportunity to take part in the fleet exercises which she did, an operational readiness inspection, an operation of that sort. Her time was fully earmarked for technical trials.

Q. What was your evaluation of her then, both in the area of her ability to pass the technical trials and the operational requirements which were later planned?

A. There was no doubt in my mind, and I think this is true generally with everyone that served in THRESHER, that she was far and away the best attack class submarine that our Navy had produced. She had certain deficiencies and these needed to be corrected. They were planned to be corrected and actually were corrected in the post shakedown availability, but she was a major step forward in many, many respects, and was an outstanding submarine, I thought.

Q. Did you evaluate her as fully capable of doing what she was designed to do.

A. Without question.

Q. Were the deficiencies uncovered of major operational significance?

A. No, I can mention a few of the things that we found out would have to be repaired or redone in the post shakdown availability. Actually, some of them we knew before the ship was ever commissioned. THRESHER's hydraulic system was built containing a fluid known as cellulube. Cellulube was used in some Navy hydraulic systems because it has a somewhat higher flash point than ordinary petroleum based oils, and it was thought that this might prevent some hydraulic casualties which had occurred in the Navy; not in submarines but in other ships of the Navy. This probably was true, but at the same time cellulube was a difficult substance to live with. You always have small leaks in your hydraulic system and this particular fluid was terrible once it got outside the hydraulic plant, because it was a very good paint remover, it would dissolve the soles of your shoes, loosen the vinyl tile on the deck and it just made housekeeping a real mess. This was recognized, and the decision was made to go back to a petroleum based oil, really about the time THRESHER was commissioned, so that it was planned from very early in the game to change over the hydraulic system from this cellulube to petroleum base oils. This was a big job, because the various gaskets and shields in your system that were compatible with cellulube were not compatible with oil, and vice versa. Consequently, the system had to be essentially torn down and completely put back together again with proper materials. This was the principle job that we anticipated in the PS. There was a multitude of others, of course, that were minor in nature.

Q. Could you describe some of the jobs that were accomplished at this time?

A. Well, actually, by the time we got into the PSA, a large quantity of additional work was thrown on the ship and a principal item was the installation of a new and experimental type sonar equipment, which was a very major job, and I believe this turned out to be the controlling job in the completion of the post shakedown availability.

Q. Controlling in what way?

A. Time-ways. Several things were done to further improve the noise quieting features of the ship, and I don't think that I should perhaps specify those.

Q. The details were of a classified nature?

A. Yes.

COUNSEL: During this session of open court we do not wish to discuss that. You will have an opportunity at a later time.

(b) (6) relieved (b) (6) as reporter at this point.

Q. From all of your experience and intimate knowledge of THRESHER and from what you have heard concerning her loss, have you formed an opinion of the possible cause of her casualty?

A. Well, I, of course, have thought about little else in recent days here. There is no way for me - or, I think, anyone else - to really know what happened out there. I have formed some opinion, yes. They are purely speculation. I do think that, whatever it was that caused the loss of the THRESHER, it must have been associated with a flooding type casualty, and I think it must have been of such a nature that it occurred almost instantaneously. Well, perhaps "instantaneously" is not the right word, but in such a short period of time that the ship's personnel were unable to react in the way that they normally would to let their escort know that they were in trouble or-- well, to let somebody know they were in trouble. From what I have been able to determine, nothing was heard or observed by the escort to indicate that they were in trouble. Therefore, I conclude that, whatever happened, it happened rather quickly. I don't see how any casualty, other than a flooding casualty and a fairly gross one, could have ~~casued~~ caused immediate loss of the ship in this way.

Q. To refresh my recollection, when were you detached from command of THRESHER?

A. I was relieved and detached on the 18th of January of this year.

Q. Did you know a large portion of her officers and crew who remained with her during the post shakedown availability?

A. Yes. I haven't tried to figure out the exact number, but I would estimate I knew and served with 80 percent of its officers and men.

Q. You have had ample opportunity to form an opinion as to their experience and competence?

A. Yes.

Q. And what is that opinion?

A. I have never served with a finer submarine crew in all my experience, and when that ship came into PSA in July, it was an outstanding ship and an outstanding crew in every respect.

Q. And a large portion of them remained on board?

A. I would estimate about 80 percent of them, sir. I don't really know the exact figure.

COUNSEL: Mr. President, this would appear, with your permission a suitable time to give the court an opportunity to ask questions, sir.

PRESIDENT: All right, are there any questions by the members of the court?

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. In your discussion of the casualty, Commander Axene, you indicated the possibility that this was something of such a catastrophic nature that they did not have sufficient time to react. Do you consider it a more likely possibility that the loss was a compound or double casualty type thing, where one casualty might have induced another casualty, or a so-called compounding of casualties - more likely?

A. I think it's quite likely that if the ship suffered a flooding casualty, it suffered a compound casualty, in that possibly some loss of electrical power ensued. The thing that has been bothering me is the fact that during all this test diving, the THRESHER was in communication, or was to maintain telephone communications, with the SKYLARK. There should have been someone with a microphone in his hands at all times, and they apparenly didn't even have time to say the few words, "I'm in trouble." This is what leads me to conclude that, whatever, happened, it happened very quickly.

Questions by a court member, CAPT Hushing:

Q. Commander Axene, in your early testimony you discussed the instrumentation prior to the initial deep dive. You stated, I believe, that there were many strain gauges employed?

A. Yes, sir.

Q. Do you know whether or not there was a redundancy of strain gauges? By this I mean, duplication in the vital areas?

A. I'm sure there was. I don't recall the exact instrumentation installation, but I know there were more than enough gauges to cover the points of interest. There was a redundancy, yes. I'm sure the Shipyard knows exactly what that instrumentation installation was. I don't know, sir.

Q. Do you have any feel for the program of the installation for the strain gauges? What I am trying to elicit is, were strain gauges installed before trials or after trials, or were they installed all at once?

A. My recollection is that they were installed over a period of time. Some were installed before the ship was launched; others were installed after launching, and I'm sure some were installed shortly before we sailed on our trials. I think that was the situation.

Q. Relative to the strain gauges, you mentioned these trials were conducted under the direction of the David Taylor Model Basin. I believe.

A. I'm not sure that they were under the direction of the David Taylor Model Basin, but the technical direction, I think, yes. They were responsible for the instrumentation and its evaluation.

Q. Did the David Taylor Model Basin have personnel embarked on the THRESHER during these trials?

A. Yes.

Q. Did the Bureau of Ships and the Shipyard have personnel on board to assist in this trial?

A. Yes. I remember specifically Admiral Moore, and Captain Roseborough was also embarked.

Q. Turning to another subject, you arrived at the Portsmouth Naval Shipyard as Prospective Commanding Officer shortly before launching, I believe?

A. Approximately one month before.

Q. Between that time and the time the initial trials commenced, you had a considerable period in which to acquaint yourself with the pressure design of the ship?

A. Yes, sir.

Q. Did you engage in discussions with technical personnel of the Shipyard regarding design?

A. Yes.

Q. And did your officers also engage in such discussions?

A. Yes.

Q. Did you form any opinions as a result of those discussions relative to the adequacy of the design of your ship to meet the intended purposes?

A. Yes, sir. I would like to elaborate a little bit on that. All of these discussions - both my own and of my officers - with the technical people of the Shipyard centered about design details. The major concept of design was a settled thing, of course, and I don't think we had many questions about that at all. Our discussions centered around details where we might have felt there was some better way of doing some detail of the design rather than what had been developed by the Yard. We asked for and actually obtained a matter of several hundred of these minor design changes as a result of this period of nearly a year during the construction of the ship. These changes, of course, are documented and are available.

Q. Were you able to satisfy yourself that the design was adequate?

A. Yes. I had no qualms about the ability of the ship to operate as designed, and from the time we initially went to sea, it only strengthened my feeling in this regard. I felt she was a well designed ship.

Q. Turning to the actual construction of the ship, did the construction of the ship during the time you observed it prior to the initial builder's trials and after builder's trials bear out the design in terms of adequacy?

A. Yes. I have always felt that this Shipyard was not too efficient in the way they accomplish their job, but I had never had any qualms about the quality of workmanship. I think it is as good as is available in this country today.

Q. Then as far as you're concerned, the design was adequate?

A. Yes.

Questions by a court member, RADM Daspit:

Q. This speculation as to the possible cause of the loss of the ship was based in part on the communications which the SKYLARK had with the THRESHER. Can you tell us what you know of those communications?

A. Yes, sir, but I must say I don't know too much with regard--

Q. I am merely trying to elucidate the information upon which you base this conjecture.

A. I have read and studied the dispatches received at the Shipyard from the SKYLARK relative to the suspected loss of the ship. These indicate to me that SKYLARK did have communication with THRESHER during the initial descent to test depth essentially, continually and reliably, up to a point from which THRESHER reported she was approaching test depth, and then nothing more was heard.

Questions by the president:

Q. Commander Axene, you mentioned SUBROC as being one of the weapons systems to be carried by THRESHER?
A. Yes, sir.

Q. Did the carrying of this weapon introduce any hazard to the safety of that ship, other than those hazards always present in torpedo warheads and other things that are carried on a combatant ship?
A. To the best of my belief, no, sir. The THRESHER, throughout my tour as Commanding Officer, never had an actual SUBROC weapon on board. We carried the dummies and shapes repeatedly. They have not yet been released from service use

Q. During your long cruise as first Commanding Officer of THRESHER, do you happen to know roughly how many miles you steamed and how many submerged hours you put in?
A. Yes, sir. I had those figures exactly as of our arrival in the Shipyard. The figures-- let's see. The miles I think I can state with some certainty. It was somewhat over 30.000 miles that the ship steamed up to the time I was relieved. As to hours submerged, I'm afraid I don't recall that one, Admiral. However, I might have it in my personal papers.

Q. Well, I just thought you might have left the ship with those fresh in mind. It's not too pertinent.
A. I did keep track of them, and I know the fact that we steamed over 30,000 miles in the first year was significant

Q. The point I am trying to get at is that during the time you were on the ship, it was not necessary to baby her or to have her in a constant state of upkeep and repair?
A. No, sir.

Q. She operated normally and without undue upkeep then?
A. In my opinion, this is true, yes, sir.

Q. I believe you said that the pressure hull was not affected by the hole which was put in your port ballast tank forward by the tug at Canaveral?
A. Yes, sir.

Q. By that answer are we safe in assuming that you mean that the pressure hull was not affected then and that it did not later show any effects from this particular incident?
A. I am convinced that this is true, yes, sir. As part of the repair job to this damage, the ship was thoroughly inspected in the vicinity of the point where the tug struck. As you know, it is a distance of some feet from the ballast tank to the pressure hull. I was concerned more with air banks located inside than I was with the ballast tank. These were inspected and found to be undamaged. I am quite certain the pressure hull was not damaged.

Q. The tug's bow did not reach the pressure hull?
A. It penetrated the ballast tank about three inches.

Q. That left it a great distance from the pressure hull?
A. Yes, sir.

Q. Captain, we know that you don't know what caused this disaster and that some of the questions we have asked you are in the nature of asking for your opinion.
A. Yes, sir.

Q. But we do know that you have probably thought of every possible thing that might have gone wrong. You have said that you are inclined to feel that it was a casualty of a flooding type. At the depths to which the submarine was submerged, will you give to the court some feel of the rate of flooding that would be experienced from even a 1-square-inch hole and point out, from an operational point of view what this might cause in the area of electrical switchboards or in a compartment well removed from the center of buoyancy of the ship?
A. I'll try, sir.

Q. We aren't asking you to give the exact rate of flooding at each depth, but just for a sense of the matter.
A. I think perhaps I could best preface this by saying that I experienced a flooding casualty while serving in the TIRU, a submarine, at Pearl Harbor some years ago. This occurred at a depth of about 250 feet, relatively shallow, and the hole involved was one of three inches in diameter. We were able to pull out of this casualty and suffered very minor damage as a result of it. However, the entry of the water into the ship was with such force that, although the hole was in the bottom of the ship, the water squirted directly to the overhead and sprayed off from the overhead, and to the people on the scene it appeared to be coming from the overhead. With that as my experience on which I largely base this opinion, I always felt from the start that the most dangerous potential casualty for THRESHER was a flooding casualty while deep. I tried to make my people aware of the potential danger, and we, I think, did our utmost to guard against such a casualty. I was convinced in my own mind that with a flooding casualty on THRESHER from any pipe or hole more than approximately an inch in diameter - perhaps a little more - that the only thing that would save the ship would be the application and use of her speed and ability to maneuver vertically. For this reason, I tried never to go deep without the propulsion plant in full operation and ready for instant use. We had convinced ourselves that without propulsion, it would have taken a very small casualty to prevent saving the ship by the use of air alone. I'm not sure whether I have answered your question.

Q. Would a flooding casualty in one of the end compartments at a slow speed cause the Commanding Officer concern?
A. Yes, indeed. A flooding in the end compartment, the ship not only becomes heavier and tends to sink, but takes an attitude opposite the one which you would like to assume to maneuver out of it. For this reason, a flooding casualty on either end of the ship is worse than one near the center of the ship.

Questions by a court member, CAPT Osborn:

Q. Just a degree of competence question, Commander Axene. You were Executive Officer of the NAUTILUS, which was the first nuclear-powered submarine commissioned in the United States Navy, and had perhaps as good a selection of personnel as existed at the time. How would you compare the degree of personnel capability, officers and men, in THRESHER with respect to your shipmates in the NAUTILUS?

A. Well, I said earlier that I had never served with a finer crew than the one that was in THRESHER, and I really believe this. Certainly the NAUTILUS crew was the most highly selective of any we had in the submarine force. We had a fine crew. I felt the same way about the THRESHER crew. I don't think there was any difference.

Q. We know the selection wasn't probably as good as the NAUTILUS because it was just one of a kind, but our training methods and the capabilities of the crews were comparable?

A. I felt that way, yes, indeed.

Questions by the president;VADM Austin:

Q. One more question by the court: Commander Axene, has this loss of the THRESHER caused you to lose any confidence in either nuclear propelled submarines in general or in the THRESHER class?

A. No, sir. I did not want to be relieved of THRESHER. I wanted to retain command for another year. My preference would have been to have taken the ship on sea trials this time. I was not able to do that. This casualty has not impaired my confidence one bit in this ship or in submarines in general. I think everybody knows there is an element of danger associated with submarines, just as there is in flying. We do everything we can to prevent this type of tragedy, but once in a while they happen.

Q. Just as automobile accidents happen.

A. Yes, sir. I view it in that light, and I think all professional submariners would.

PRESIDENT: Commander, we thank you for your testimony, and we may wish to call you back if we run into anything in the classified area that you weren't able to go into.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to add at this time.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

PRESIDENT: The court will recess for a short time to enable counsel to line up his next witness.

The court recessed at 1030 hours, 13 April 1963.

The court opened at 1347 hours, 13 April 1963.

All persons connected with the court who were present when the court recessed were again present in court.

(b) (6) relieved (b) (6) as reporter at this point.

James D. Watson, Lieutenant (junior grade), U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station?
A. James David Watson, lieutenant (junior grade), Navigator and First Lieutenant on the USS SKYLARK, the ASR-20.

Q. Lieutenant (junior grade), United States Navy.
A. United States Navy.

Q. Directing your attention to the morning of 10 April 1963, you were then stationed on the SKYLARK?
A. Yes, sir.

Q. And on that morning the SKYLARK was proceeding in company with another ship?
A. Yes, sir.

Q. Please state the circumstances?
A. We were proceeding from an area where the USS THRESHER completed her shallow dives to an area where she was going to make her test dive, deep test, and on arrival on station we established communication and she proceeded.

Q. By 0800 on the morning of the 10th, where was your initial position?
A. We were located at the initial test position at 41.47 North and 65.01 West.

Q. And where was THRESHER with relation to you?
A. The last communication we had, a range test that she had with us, bearing 147 at 3400 yards.

Q. And your base course and speed, Lieutenant?
A. Base course and speed at that time was I believe, 270.

Q. This was around 0800 in the morning, local time?
A. At 0801 our base course was 270.

Q. And speed?
A. At two and a half knots. We were using RPM's to maintain steerageway.

Q. Now was this the course and speed of SKYLARK only, or of THRESHER also?
A. This was only SKYLARK's course and speed.

Q. And what do you know of THRESHER's course and speed at about that time?
A. We were given no indication as to her actual speed. We can only theorize as to what it might be.

Q. And her course?
A. Her course was in a southerly direction.

Q. Where were you in SKYLARK at that time?
A. I was in the pilot house at the chart desk.

Q. And at 0800 who was operating the UQC, the underwater telephone equipment?
A. Boatswain's Mate Third Class Mowen, sir.

Q. And who was recording the transmissions and the messages received on the UQC?
A. Radioman third class (b) (6) .

Q. Now had there been good communications between SKYLARK and THRESHER by way of the UQC prior to this time?
A. Yes, sir.

Q. Was THRESHER on the surface at 0800?
A. No, sir, she was at periscope depth

Q. You could see her?
A. Yes, we held her on radar for several -- well, for a considerable period of time before she submerged.

Q. She remained at periscope depth, then, until her dive?
A. Yes, sir.

Q. Until she commenced performance of her deep dive?
A. Yes, sir.

Q. Do you have the official UQC log of the SKYLARK in your possession?
A. Yes, sir, I have it in front of me.

Q. Produce it. Is this it?
A. Yes, sir.

COUNSEL: I offer the log to the court for the purpose of introducing it into evidence.

REPORTER: This will be Exhibit 16.

The log (Exhibit 16) was submitted to the court and was offered in evidence by counsel for the court, ~~for the purpose of introducing it into evidence.~~

There being no objection, it was received in evidence.

Q. Does this log, Exhibit 16, contain entries for the 9th and 10th of April of this year?
A. Yes, sir.

Q. Now, before referring to the log, you have told us of your position at that time -- of the ship's position at that time. Do you have the official navigational chart and track of SKYLARK?
A. No, sir, I don't. It's being prepared and submitted from the ship at a later date.

Q. Directing your attention, then, to the morning of 10 April, at a time about eight o'clock, was there a clock located on the bridge of the ship?
A. Yes, sir, it was to the left and above the chart desk.

Q. Can you tell us whether that clock had been reset recently to the correct time -- recently with relation to that morning I mean?

A. Yes, sir, it had been. This is a daily morning routine performed by the Quartermaster. He goes into the radio shack with a comparing watch that has a proven rate and gets a time fix, comes up and compares it, resets the clock, and shortly afterwards he will give the motor room and engineering spaces the time-data so that they can reset their clocks in accordance with what he has in hand.

Q. Do you recall what the error was at the time of reset of the clock on the morning of 10 April?

A. No, sir.

Q. Was it a good clock; did you have trouble with it?

A. Never have had any trouble with it.

Q. You're satisfied, then, as to its accuracy on the morning in question?

A. Yes, sir.

Q. Now, if you will refer to Exhibit 16 and to the entries for the 10th of April, starting at roughly about a quarter of eight or eight o'clock, whatever the first entry in that scope is there -- I note that the log contains a "Time of Entries"; how were times logged for the entries in that log?

A. In most cases they are logged as to the nearest minute. In some cases there are multiple entries made on the minute or within a few seconds after the minute.

Q. Now referring to the log at the time of about 0745, quarter of eight in the morning on the 10th of April, what was the last carefully fixed position of THRESHER which is recorded there?

A. In relation to SKYLARK, at 0745 the THRESHER held us bearing 147 at 3400 yards.

Q. Do you know her course and speed at that time?

A. No, sir, we had no indication as to her course at that particular time. We did get the course information from her after this time.

Q. It was generally southerly, you have already testified; is that correct?

A. Yes, sir.

Q. Then at 0800 does the log reflect that she notified you of her course?

A. Yes, at 0800 she informed us that her course was 180.

Q. What was the purpose of your being in company with her at about this time in the morning?

A. We were standing by her while she was conducting her test dive.

Q. Now I direct your attention to an entry for 0747 on that day. Did you receive a message from her over the underwater telephone which was logged?

A. Yes, sir.

Q. What was the message?

A. At 0747 she informed us she was starting her deep dive.

Q. Starting her deep dive?

A. Yes, sir.

Q. And at the time of receipt of this message she was at periscope depth?
A. Yes, sir.

Q. How often did you communicate with her while she was doing her deep dive? Or let me put the question another way if that's difficult. Did you request GERTRUDE checks?
A. Yes, sir, we requested GERTRUDE checks every fifteen minutes.

Q. How that GERTRUDE is spelled like the girl's name GERTRUDE?
A. Yes, sir.

Q. What does it mean?
A. It's an underwater telephone.

Q. And a GERTRUDE check means that she was to communicate with you every fifteen minutes; is that right?
A. This is correct.

Q. Or more frequently.
A. Yes, sir.

Q. Now what was the next communication between THRESHER and SKYLARK which followed that?
A. After the GERTRUDE check?

Q. After she notified you at 0747 that she was commencing her deep dive?
A. The next communication we had from THRESHER was at 0749, when she informed us that it was O. K. to maneuver as long as we remained in present position.

Q. And the communication after that?
A. This communication was passed at 0750. The communication was we requested a GERTRUDE check every fifteen minutes.

Q. And following that, a 0752 entry?
A. Yes, sir, she informed us that she was at 400 feet checking for leaks.

Q. What time?
A. 0752, sir.

PRESIDENT: Counsel, you should caution the witness that if one of your questions requires an answer that would be classified, he should so inform us rather than answer it giving classified information. We are getting into depths now.

Q. I have already given you that warning, have I not?
A. Yes, sir.

Q. And you have it firmly in mind?
A. Yes, sir.

Q. You were experiencing no trouble with communications between her and you?
A. No, sir.

Q. Now the next entry is at 0754, is it not?
A. Yes, sir. The THRESHER informed us at this time that any future reference to her depth would be her test depth.

Q. And the next transmission, please?
A. The next transmission THRESHER informed us that her course was 180.

Q. And the time for that?
A. At 0800.

Q. Now you made a reply to her on the UQC, did you not?
A. Yes, sir, we gave them a ROGER, which means we acknowledged her transmission.

Q. And then at 0801?
A. This was the time that we had given them the ROGER. We also told them at the same time that our course was 270.

Q. Now courses which are logged in degrees are logged in degrees True, are they not?
A. Yes, sir.

Q. What was the relative position of the two vessels to each other then, if you know? Were you to the north and west of them?
A. We assumed that this was our relative position, that we were to the north and they were to the south.

Q. And you would have them then on--
A. Probably on the starboard quarter.

Q. Now what was the next message received from them?
A. The next message received was at 0809. THRESHER informed us that she was proceeding to one-half test depth.

Q. To one-half...?
A. Proceeding-- oh, I'm sorry, proceeding one-half test depth.

Q. Now I believe that---

PRESIDENT: The court at this time reminds both the counsel and the witness that we must avoid disclosing classified information.

COUNSEL: May I request the court be cleared, sir.

PRESIDENT: Clear the court.

The witness was warned not to discuss his testimony with anyone during the time the court was closed.

The court closed at 1405 hours, 13 April 1963.

The court opened at 1413 hours, 13 April 1963.

All persons connected with the court who were present when the court closed were again present in court.

The witness was reminded that the oath he had previously taken was still binding.

Questions by counsel for the court:

Q. The reason we called for a clearing of the court was your reply to the last question, reading from the book, did not seem comprehensible to the court. If you will look at the 0809 entry and read it just as it is written there, I believe you will correct the impression made by a misreading.
A. 0809 - THRESHER informed us "Am proceeding one-half set distance."

Questions by the president:

Q. Set distance?
A. Yes, sir.

Q. Not one-half test depth?
A. No, sir.

Q. Look carefully, now, what we want is what's in the log, not an approximation of it?
A. Yes, sir. Well this is exactly what's in the log, "one-half set distance."

PRESIDENT: All right, that's a different story.

Questions by counsel for the court:

Q. Now the 0835 entry can be read exactly as it is in the log. Please read it to us?
A. 0835 - THRESHER informed us, "Proceeding to test depth minus three hundred feet."

Q. And at 0853?
A. 0853? THRESHER informed us, "Proceeding to test depth."

Q. Now you communicated with THRESHER at 0902?
A. Yes, sir.

Q. What was that communication and his response to it?
A. At 0902 we communicated with the THRESHER and we informed her that our course was 090.

Q. And his response?
A. And he asked us to repeat the course, or, "Say again," were his exact words.

Q. But communications between you were still --
A. Were still good.

Q. Then there is an 0912 entry, is there?
A. Yes, sir.

Q. Please read that?
A. She asked us for a GERTRUDE check at this time.

Q. And you gave it?
A. We came back with a KILO, which means, "Go ahead and transmit," and she came back with a KILO to us.

Q. KILO, K-I-L-O?
A. Yes.

Q. Did you have a bathythermograph reading to establish the gradient of the water?
A. No, sir, we have no bathythermograph aboard.

Q. Had THRESHER told you what the thermal conditions were?
A. No, sir.

Q. Well can you describe what the weather conditions were between then and the time your narrative commenced, at 0745?
A. Well the wind was from the northwest about 300 degrees at approximately fifteen knots. The sea state, a little over one. And the sky was overcast. I believe that sums it up.

Q. Now at 0912 when THRESHER asked SKYLARK for a GERTRUDE check and SKYLARK transmitted it, did THRESHER "ROGER" for a receipt of that?
A. At the 0912?

Q. Yes
A. No, sir.

Questions by the President:

Q. I thought that you gave a KILO and that THRESHER responded?
A. She responded with a KILO, yes, sir.

PRESIDENT: Please be accurate in what you tell us. Don't say one thing if you mean another.

WITNESS: Yes, sir. I thought he was looking for a specific "ROGER" for the message.

PRESIDENT: Please be more concise in your questions, counsel.

Questions by the counsel for the court:

Q. Well she acknowledged receipt of your transmission?
A. Yes, sir.

Q. And the time of her acknowledgment of the receipt was what?
A. 0912 plus about ten seconds.

Q. Now we are coming to a very critical point timewise.
A. Yes, sir.

Q. First, what happened after you received acknowledgement of your transmission?
A. We received a transmission from THRESHER stating: "Have positive up angle. Attempting to blow up."

Q. There is no time entry for that particular entry, is there?
A. No, sir.

Q. But you heard those words yourself, did you?
A. Yes, sir.

Q. And your best estimate of how soon after 0912, when the word KILO was heard, was how long?
A. Well due to the ensuing communications between 0912 and this communication, I would have to estimate it approximately one minute.

Questions by the President:

Q. So your best estimate of the time when the THRESHER advised that she had positive up angle was 9:13?
A. Yes, sir.

Q. That's your best estimate, but it's only an estimate?
A. Yes, sir.

PRESIDENT: Proceed, Counsel.

Questions by counsel for the court:

Q. The phrase, "attempting to blow up." Will you explain what that means in normal naval parlance?
A. Well it means that the submarine would close its vents and through the air manifold system would blow air into the tanks which would clear them of water and normally bring them to the surface.

Q. Following your hearing of that message, did you hear any other sounds over the UQC equipment?
A. Yes, sir. We could hear what sounded like definite air being blown, or air under pressure.

Q. You said, "We could hear;" who could hear that at that time?
A. There was the commanding officer, myself, and the two enlisted men.

Q. And what happened at that point?
A. At 0914 we told the THRESHER, "No contacts in area," and otherwise that it was clear for her to surface.

Q. What happened next after you sent that message?
A. At 0915 we requested her course and range and bearing from us. The exact statement is: "My course is 270. Interrogatory range and bearing from you."

Q. You told him your course?
A. Yes, sir.

Q. Now had you received any reply to your transmission of 0914?
A. No, sir.

Q. Did the commanding officer take some action upon the receipt of that message?
A. On the receipt of the message that she was attempting to blow up, he took the microphone and started communicating himself with the THRESHER.

Q. Then the 0915 transmission to him was made by the Commanding Officer of SKYLARK direct on the UQC equipment?
A. Yes.

Q. Was there an answer to that received from THRESHER?
A. No, sir. When he received no answer he commenced calling the THRESHER asking, "Are you in control?" And he repeated this question at least four times to my knowledge and received no answer.

Q. Now at this time, 0915, did the SKYLARK hold her course and speed?
A. Yes, sir.

Q. What was her speed at that time?
A. It was the same as before, two and a half knots.

Q. You had been on that speed for some time?
A. Yes, sir.

Q. While you had been proceeding at that speed, had THRESHER stayed within GERTRUDE range at all times previously?
A. Yes, sir.

Q. What does that indicate with respect to her speed?
A. It would indicate that her speed was slow but that she was opening to the south from us.

Q. Now at 0915 you said the commanding officer himself manned the UQC equipment and sent inquiries to THRESHER?
A. Yes, sir.

Q. While he was transmitting at that time could he hear any sounds coming from THRESHER, or could you?
A. No, sir.

Q. Why is that? Do you have an explanation for that during the transmission?
A. Well normally during the transmission phase of UQC it blanks out all other sounds, and there's a short period after the transmission has gone out that this sound will still be blanked out due to the time it takes the signal to get down and get back.

Q. You said you heard "blowing" sounds?
A. Yes, sir.

Q. For how long a duration did those sounds continue within your hearing?
A. I would say not over three to four seconds that we could hear.

Q. But part of the interim period was taken up with transmissions outbound from SKYLARK?
A. Yes, sir.

Q. What was the next thing you heard?
A. At 0917 we received a garbled message and we can only assume that it was at the tail end of one of our outgoing transmissions. Most of the message was blotted out but the two words that the commanding officer and myself caught that were clearly understood were, "test depth." There was something preceding it but we couldn't tell what it was.

Q. Something preceding it and then the two words, "test depth"?
A. Yes, sir.

Q. You heard that yourself:
A. Yes, sir.

Q. And there is no question in your mind about those two words?
A. No sir.

Q. How much of a garble preceded those two words in time span -- short, long?
A. Well it was rather short.

Q. The English language has a very distinct cadence to it. Can you make any judgment as to how many words might have preceded -- of course, it depends on the rhythm, but from the rhythm of it -- how many words preceded "test depth" that were garbled?
A. I would say not over two or three.

Q. Now you say you heard the words "test depth" clearly?
A. Yes, sir.

Q. Did the commanding officer, who was on the equipment, say that he heard them too?
A. Yes, sir.

Q. Did he hear any more than that?
A. Both of us, shortly after that, heard a sound that registered with me as being familiar because of the fact that I had heard a lot of ships breaking up during World War II after having been torpedoed at depths. It sounded as though there was a compartment collapsing or something similar to that nature.

Q. Did you hear anything in addition to the sound which you identified as similar to a compartment breaking?
A. No, sir.

Q. Can you describe that sound to the court?
A. It is a rather muted, dull thud.

Q. Did the commanding officer indicate that he heard that?
A. Yes, sir.

Q. Was he able to form an opinion as to the source of the sound?
A. Both of us discussed it very shortly after and we agreed that it sounded similar to a breaking up noise.

Q. Now who was doing the recording in the UQC log of the times and entries during the critical period that you have covered in your testimony?
A. A Radioman Third Class named (b) (6)

Q. Is he known to you to be a reliable man?
A. Yes, sir.

Q. Would your previous knowledge of him lead you to have confidence in the accuracy of the times which he recorded?
A. Yes, sir.

Q. After hearing the sounds which followed the last transmission from THRESHER, what did SKYLARK do next?
A. Asked for a radio check with the possibility that he might have gone outside of GERTRUDE range and possibly put his periscope up or his radio antenna.

Q. But did you keep steaming?
A. Yes, sir.

Q. Did you change your speed?
A. We stopped eventually and secured our fathometer and our sonar equipment so that we could hear better, and continued to try to communicate with the THRESHER.

Q. You made every effort to listen on the UQC?
A. Yes, sir.

Q. What was the setting on the volume control of the receiver on the UQC?
A. It was set as high as we could go without getting a lot of background squealing on it, which was almost maximum.

Q. What did you hear?
A. Nothing.

Q. Now at 0931 did you take some further action?
A. At 0931 the commanding officer directed, and we conformed to his direction by requesting from THRESHER a radio check every sixty seconds.

Q. What was the purpose of that?
A. If she had gone out of GERTRUDE range and had put her antenna up, we would have been able to communicate with her.

Q. And did you continue with your GERTRUDE checks?
A. Yes, sir. GERTRUDE checks were made also every minute thereafter.

Q. What was your next action?
A. The next action that we took was at 1006, we asked THRESHER on GERTRUDE -- I'm sorry -- by radio: "QUEBEC, QUEBEC, QUEBEC."

Q. That's QUEBEC - Q-U-E-B-E-C
A. That's it, yes, sir.

Q. What is the meaning of sending a QUEBEC?
A. Well we asked her to indicate her position by any means possible.

Q. And was there any indication of her position subsequent to that made by her?
A. No sir.

Q. Were there any other significant noises heard by you on the UQC equipment?
A. No sir, just normal background noises.

Q. Then at 1058 you took your next action, did you not?
A. At 1058 we commenced dropping patterns of three hand grenades at intervals of about ten to fifteen minutes.

Q. What was the purpose of this?
A. The purpose of this was to alert the THRESHER that we were trying to communicate with her and that she should surface if possible.

Q. And was there any response from THRESHER?
A. None.

Q. Following that, what action did you take? At about 1100?
A. At 1100 we sent a communication on the radio telephone, the underwater telephone I should say, directing THRESHER to "Indicate your position or prepare to surface. Acknowledge within ten minutes or I will initiate SUBMISS."

Q. And that was at 1129?
A. At 1129 we sent a communication on the underwater telephone that: "We have initiated SUBMISS. Indicate your position."

Q. At 1100 you said you would, is that it?
A. Yes, sir.

Q. Did you sight an oil slick at that time?
A. No, sir, the oil slick was sighted later on in the day by the USS RECOVERY, an ARS.

Q. Now at any time during the operations with THRESHER prior to that, prior to this incident, did you hear machinery noises on your UQC or on your sonar, emanating from her?
A. Nothing that could be identified as machinery noises.

Q. Now you testified that your duties on board the SKYLARK included your office as Navigator, right?
A. Yes, sir.

Q. What was your position reference for the operation on which you based your reports?
A. The THRESHER's position in relation to us? The last position we had was her bearing and range of 147, 3400 yards from us.

Q. And how did you establish your position?
A. We established our position by LORAN.

Q. Can you go into some greater detail?
A. Well we have a LORAN DAS-4 Model, and we have two well established LORAN lines in the area and were getting excellent fixes from the LORAN.

Q. You would estimate then that your position was known with accuracy?
A. Yes, sir.

Q. Did the position of the oil slick sighted by RECOVERY, to which you have alluded, correspond with a reasonably postulated position for THRESHER?
A. Yes, sir.

Q. Where was the position of that oil slick?
A. It was about 7,000 yards to the southeast of the original position.

Q. What do you mean by the original position?
A. Well the position at which it commenced the test dive.

Q. And, paying particular attention to that time and the time when the oil slick was reported, what was the direction of wind and current?
A. The current, normally, according to pilot charts and books was indicated by our track was to the southwest at about four-tenths of a knot. The wind was blowing from about 300 at about 15 knots. And the oil slick tended in the downwind direction of the wind.

Q. Again this 300 is true?
A. Yes, sir.

Q. Now at 1129 you sent a message -- you made a transmission at that time?
A. Yes, sir.

Q. What was that?
A. "Have initiated SUBMISS. Indicate your position."

Q. Was there any reply to that transmission from THRESHER?
A. None.

Q. You received no reply?
A. No, sir.

Q. Describe the operations of the SKYLARK thereafter?
A. We continued dropping grenades at intervals, and we continued checking with the GERTRUDE, and also with the radio, trying to get some sort of communication from her, and this continued on up until quite late in the evening as far as the grenades were concerned.

Q. And in the evening did you rendezvous with the USS RECOVERY?
A. We rendezvoused with her at about 1738, I believe it was, at which time she was sitting in the center of the oil slick.

Q. You saw the oil slick yourself?
A. Yes, sir, I have pictures of it.

Q. How were those pictures taken?
A. They were taken with a Polaroid camera, and at the time we had bright sunlight. One picture turned out very well. The other is rather bright due to the sunlight showing up off the water.

Q. If you have those prints, produce them.
A. (The witness did so.)

Q. These are they?
A. These are the pictures.

COUNSEL: I offer them to the court for the purpose of introducing them into evidence.

REPORTER: These will be Exhibits 17 and 18.

The photographs (Exhibits 17 and 18) were submitted to the court and were offered in evidence by counsel for the court for the purpose of introducing them into evidence.

WITNESS: The dark areas on the pictures are the actual clear water that was seen.

There being no objection, they were received in evidence.

PRESIDENT: I might add, for the benefit of the press in the room, that when we introduce these into the record they are not available. But I don't think you're missing a thing because I don't think they'd reproduce.

Q. As an eye witness on the spot, do those reflect a true reflection of what the camera lens viewed?
A. Yes, sir. I might add that this oil slick was approximately one-half mile wide by a mile and a quarter long, tending downwind.

Q. Could you say from your observation of it that it continued to grow?
A. It would be difficult to tell. You could not determine any real source. It looked as though it might have been one gush of oil and ended at that.

Q. You noted no increased growth while you observed it?
A. No, sir.

Q. How long did you observe it?
A. We were in the area of the oil slick for approximately two hours.

Q. Did you take samples of the oil slick?
A. Yes, sir.

Q. Do you have them with you?
A. I don't have them with me; they're on the way.

Q. Did you take anything else from the oil slick beside samples?
A. We have one small item which resembles a fishing net float.

Q. Produce it.
A. (The witness did so.)

COUNSEL: I offer it to the court for the purpose of introducing it into evidence.

The float (Exhibit 19) was submitted to the court and was offered in evidence by counsel for the court for the purpose of introducing it into evidence.

REPORTER: This will be Exhibit 19.

There being no objection, it was received in evidence.

Q. The reporter has marked here arabic numerals 1 and 9 as an exhibit. I note an additional number two with a sharp sign in front of it?
A. Yes, these were our numberings for the things that we picked up. The oil was the first, this was the second.

Q. You added it after retrieving it?
A. Yes, sir. We also retrieved an orange-colored rubber glove shortly after retrieving this spool type thing, and it was forwarded to the USS BLANDY, I believe, and forwarded by other means.

Q. Did the BLANDY deliver into your possession two items found in the area?
A. Yes, sir.

Q. Do you have them?
A. Yes, sir.

Q. Produce them.
A. The first item was a pair of rubber gloves. I think this is BLANDY's marking on that.

Q. Would it be better to say that there are two individual rubber gloves, and not necessarily a pair?
A. Yes, sir, both of them are meant for the right hand.

COUNSEL: I offer them for the purpose of introducing them into evidence.

REPORTER: These will be Exhibit 20.

Two rubber gloves (Exhibit 20) were submitted to the court and were offered in evidence by counsel for the court for the purpose of introducing them into evidence.

There being no objection, they were received in evidence.

WITNESS: And this piece of plastic material.

Q. Would you identify that as adhesive polyeurothene?
A. I could not positively identify it because I don't know the distinguishing features between plastics.

COUNSEL: I offer this to the court for the purpose of introducing it into evidence.

REPORTER: This will be Exhibit 21.

The piece of plastic material (Exhibit 21) was submitted to the court and was offered in evidence by counsel for the court for the purpose of introducing it into evidence.

There being no objection, it was received in evidence.

Q. The arabic number "3" preceded by a sharp sign was added after that?
A. I believe this was BLANDY's marking.

Q. You have no knowledge of your own as to the actual source or circumstances of the acquisition?
A. No, sir, all I'm sure of is that it was found in the general vicinity of where we assume the THRESHER went down.

Q. Thereafter SKYLARK continued her search, did she not?
A. Yes, sir.

Q. And do you have charts and so forth to show the nature and extent of that search?
A. We have a track chart covering the entire period from the beginning of her test dive until -- I believe it is still running, the track chart, and also our navigational chart, and a chronological log of events which will be forwarded as soon as it is completed.

Q. You do not have them in your possession?
A. I do not have them.

Q. Now on that last item, Lieutenant, you heard with your own ears those significant transmissions around 0912, 14, and thereafter. Could you tell, either from recognition or from the tone of voice, who was talking on the phone from THRESHER?
A. I can only assume that from the tenor of the voice I would venture to say it would be the Commanding Officer because his voice was unhurried and had no note of hysteria, and I would assume it would be the Commanding Officer because he is the one most likely to carry on in this manner under difficult circumstances.

COUNSEL: I have no further questions.

(b) (6) was introduced as reporter and was duly sworn, relieving (b) (6)

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. Mr. Watson, was SKYLARK, during this exercise, tracking THRESHER with her own sonar?
A. We could only track her at limited periods of time. Our sonar is limited to 1100 yards range. This is about maximum under motion conditions.

Q. This is by echo ranging on THRESHER?
A. Yes, sir. It is not a very satisfactory sonar that we had aboard.

Q. Now at the time that you heard the noises which you identified as possible break-up noises, this was shortly after 0917?
A. Yes, sir.

Q. Could you refer to your log. I'd like to ascertain this time as exactly as we can, recognizing that there are limitations here, but I believe at 0917 you heard the garbled message?
A. Yes, sir.

Q. And the possible break-up sounds were subsequent to 0917?
A. Yes, sir.

Q. You heard these. Could you estimate that they were two minutes after the last--after the garbled transmission, or three minutes, or what kind of estimate?
A. The only thing I'm really sure of is that it was over a minute afterwards and we were both standing there listening for something else and heard this noise. The exact amount of time, I can't be sure because we didn't look at the clock or anything.

Q. At 0931 there was a transmission relative to radio communication?
A. Yes, sir.

Q. It is my understanding that at 0931 you--SKYLARK--began trying to call THRESHER at intervals, is that correct?
A. Yes, sir, every minute.

Q. All right. At 1058 you started dropping grenade signals?
A. Yes, sir.

Q. You mentioned dropping three charges at ten minutes, I think.
A. They were not all definitely ten or fifteen minutes apart.

Q. Right, but three charges?
A. Yes, when the commanding officer said they should be dropped generally.

Question by a court member, CAPT Nash:

Q. Those will show up in you ship's log?
A. Yes, sir, and we have sent a message to SUBLANT informing him of this.

Q. Would you say that dropping three charges is an established signal which THRESHER could be expected to understand? Let me say this again. If THRESHER heard those signals, would they have an established meaning to THRESHER?

A. Yes, sir.

Q. And that meaning would be?

A. That would be to surface.

Questions by a court member, CAPT Osborn:

Q. I have one question to start out with respect to the relative bearings involved, with respect to initial orientation at 0745, was the bearing 147, 3400 yards from the SKYLARK to the THRESHER or from the THRESHER to the SKYLARK?

A. No, we were 147, 3400 yards from the THRESHER.

Q. You are southeast?

A. Yes, sir, and she was heading in a southerly direction.

Q. Now let us understand. And you note your courses and speeds, is that correct?

A. Yes.

Q. Now, you were southeast of the THRESHER?

A. Yes, sir.

Q. And the oil slick at the--when discovered, was southeast of you?

A. Southeast of the position we were in at that time.

Q. And we have--

A. The bearing about 160, I believe it was.

Q. Of course we will have sufficient track charts with updated Loran positions.

A. Yes.

Q. To establish these positions?

A. Yes, sir.

Q. Relatively accurately?

A. Yes, sir.

Q. How accurate would you say, with respect to what your repeatabilities were with respect to your LORAN position in this particular area?

A. I'd say it was excellent at the time.

Q. What is "excellent"?

A. Oh within--

Q. Half a mile"

A. Yes, sir.

RADM DASPIT: There is some doubt in my mind as to where the relative bearing is but I think if we wait until we get the written transcript, then we can go back because I agree initially he gave it but later he got it turned around and we will have to wait until the testimony is written.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Was there some confusion in the logging of those columns as to whether it was "from" THRESHER or "to" THRESHER that you know of?
A. THRESHER has stated "hold you 147 at 3400 yards."

PRESIDENT: There couldn't be a mistake there. That "hold you" from the ship means you bear from me.
A. Yes, sir.

CAPT Osborn: Now I am clear.

Questions by the president:

Q. Mr. Watson, you have said that there were two good lines that you were getting your LORAN fixes from?
A. Yes, sir.

Q. What was the angle between those lines?
A. Approximately 65 degrees.

Q. 65 degrees?
A. Yes, sir. We were substantiating them as nearly as possible with soundings after we activated our fathometer again.

Q. And were you in an area where the contours of the bottom gave you fairly good index of position?
A. Yes, sir. Within a ten mile distance off of the thousand fathometer curve, it shoaled down to 1600 fathoms, straight southeast and on either side it--well there actually was a sort of a valley effect in there 1600 yards deep in a circle from the thousand fathometer curve, and where we were initially, we got a sounding of 1280 fathoms, and running back and forth we could spot our sounding line in and get on the same depth again. It seemed to be pretty consistent.

Q. Now, going back to the transmission at 0917, which was garbled and which you think consisted of roughly four or five words, was there any indicating of panic in the voice as you could hear it at that time?
A. No, sir.

Q. None whatever. Do you have any theory, based on the garbled sounds that you heard before the two words that you did identify as to what any of those three-two or three preceding words--might have been?
A. Yes, sir. My commanding officer and myself both feel, although we can't be sure, that we heard the word "exceeding" prior to the "test depth."

Q. So if you had to bet--
A. If I had to make a direct statement, I would say this was it.

Q. How long had you been the navigator of the SKYLARK?
A. Since January 8, 1961.

Q. '61?
A. I'm sorry, '62.

Q. '62?
A. Yes, sir.

Neither consel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

I can't really think of anything to add to this, except that we continued the search and picked up various articles of debris and so forth which we passed to the other ships in the area.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

The court recessed at 1505 hours, 13 April 1963.

The court opened at 1515 hours, 13 April 1963.

All persons connected with the inquiry who were present when the court recessed are again present in court.

Roy S. Mowen, Jr., boatswain's mate third class, U.S. Navy, was called as a witness by the court, was informed of the subject matter of the inquiry, was advised of his rights under Article 31 of the Uniform Code of Military Justice, and examined as follows:

DIRECT EXAMINATION

Questions by counsel:

Q. This is an open session of the court and for that reason classified information should not be spoken here, indicated, or divulged by you. If the answer to any question that I ask you would include classified information, please so state instead of answering the question.
A. Aye, aye, sir.

Q. State your name, grade, organization and present duty station.
A. Roy S. Mowen, Boatswain's Mate Third, U. S. Navy, USS SKYLARK, ASR20.

Q. That is Roy S. Mowen, Jr.?
A. Yes, sir.

Q. M-O-W-E-N?
A. Yes, sir.

Q. Directing your attention to the morning of 10 April of this year, were you then stationed in SKYLARK?
A. Yes, sir.

Q. And at about 0745 in the morning, what was your station in SKYLARK?
A. I was assuming the watch on the bridge.

Q. And what was your watch on the bridge?
A. I assumed the watch as Boatswain's Mate of the watch and then I

took over the UQC.

Q. And were you the UQC operator?
A. Yes, sir.

Q. What is the extent of your experience in operating the UQC?
A. I have been on board SKYLARK four years, sir, and when I had the watch on the bridge I am normally the UQC operator.

Q. How was the UQC equipment functioning that morning?
A. It was working well, sir. There was slight background noise, but other than that it was coming in loud and clear, sir.

Q. Could you identify that or describe that background noise?
A. Just normal distortion due to, I would say, waves in the air or water. It was functioning normally.

Q. There was no noise you could identify as emanating from THRESHER?
A. No, sir.

Q. Background noise, that is?
A. No, sir.

Q. The equipment then was operating well?
A. Yes, sir.

Q. And with good reception, from your own experience, with good reception such as was obtaining at that time, what was the range of the UQC?
A. From seven to eight thousand yards, sir.

Q. Now from your experience in operating the equipment in the past, if a submarine had a direct stern aspect to your receiver, how would the reception be?
A. There would be no reception, sir, if she had any headway on it would tend to wash out any transmission that they would try to give, sir.

Q. At around--at about 0800 on the morning of the 10th, who was on the bridge with you?
A. The Captain, the OD, (b) (6) , RM3: LTJG Watson, messenger, helmsman, two lookouts and there possibly could have been a few other people there.

Q. And what was (b) (6) job?
A. He was the recorder for the UQC log, sir.

Q. Now I show you this Exhibit 16. Can you identify it?
A. Yes, sir. It is the UQC log for USS SKYLARK, sir.

Q. Directing your attention to the entries for the 10th of April--
A. Yes, sir.

Q. Of this year, and to the time commencing at 0745, what was the time of the last satisfactory range check with THRESHER, if you know?
A. It was just before I come on watch for 0745, sir.

Q. There was no--and what was that?
A. That was 0745 "Hold you 174 at 3400 yards," sir.

PRES: 174?

WITNESS: That is what it has in here, sir. It is 200 in front of that and it says--I am sorry, sir--147

PRES: That is quite different.

WITNESS: My mistake, sir.

PRES: Be extremely careful that you give exact and correct evidence.

WITNESS: Yes, sir.

PRES: You see if I hadn't heard that that was wrong, I might not have known that and we would have gotten the wrong bearing down.

WITNESS: Yes, sir, Admiral.

(By Counsel)

Q. Then during your watch no range checks were made with THRESHER, is that correct?
A. That is correct, sir.

Q. Describe in your own words the events occurring on and after 0800 that day?
A. In the log she was at--I don't know whether I should say this depth or not.

COUNSEL: Just "a depth."

PRES: If you are in doubt, don't say it.

A. She was at a depth checking for leaks, sir.

Q. Yes, and then?
A. And then she gave "my future reference ~~two~~ 70 depths will be given as test depths" and then there was a few course changes and she give-- I don't know whether to say this or not--"at 0807 am proceeding to--"

PRES: Wait a minute. If you are in doubt as to whether you are giving away classified information or not, please stop.

(By Counsel)

Q. Yes. Would you take a look at the entries in Exhibit 16 and say, just tell us, whether to the best of your recollection and belief they accurately reflect the transmissions you heard?
A. Yes, with the exception of this one here, sir. This one is backwards, sir.

Q. You indicate an entry of 0902?
A. Yes, sir.

Q. And you say the call signs are transposed forwards and backwards?
A. Yes, sir

Q. There is a question mark after that entry?
A. Yes, sir, that is right.

PRES: Is that entry of any significance?

COUNSEL: I will show it to the court.

(The court then examined Exhibit 16)

PRES: It has no significance whatever, none whatever. In fact I have no objection to your reading that transmission because it is not classified.

(By counsel)

Q. Do not read the "from" and "to" as they are written but just the transmission.

A. At 0902 THRESHER told us, SKYLARK, she was coming to course 090, sir.

Q. Except for that discrepancy, are the transmissions in accordance with your memory of them for the whole period 0745-- and you look right through them--until 10 o'clock, or for your watch?

A. This one here is backwards too. I don't recall this being--

COUNSEL: He has found another entry in which the "from" and "to" is reversed, and it is 0912. (Shows Exhibit 16 to court)

PRES: There is no objection to reading that. It has already been put into evidence. Just don't read the code signals, that is all.

(By counsel)

Q. First read this and then I will ask you the question.

A. This, at 0912, we got from THRESHER to SKYLARK, it is in the book, "Have positive up angle, attempting to blow up." I received it over the UQC, sir as "Experiencing slight difficulties, have positive up angle, attempting to blow; will keep you informed."

PRES: In other words the recorder in that case did not record all that you heard?

WITNESS: That is right, sir, and he was about six to eight feet away from the UQC; he was on the other side of the desk.

PRES: He wrote the gist of what you said.

WITNESS: Yes, sir.

PRES: But he didn't write it all?

WITNESS: No, sir.

PRES: And now will you say for us again what you recall as being the exact signal?

WITNESS: From THRESHER to us, sir, "experiencing minor difficulties; have positive up angle; attempting to blow; will keep you informed."

PRES: I am going to read back to you, because this is a very significant message and we want to get the best evidence possible as to exactly what the ship said,--"Experiencing minor difficulties--"

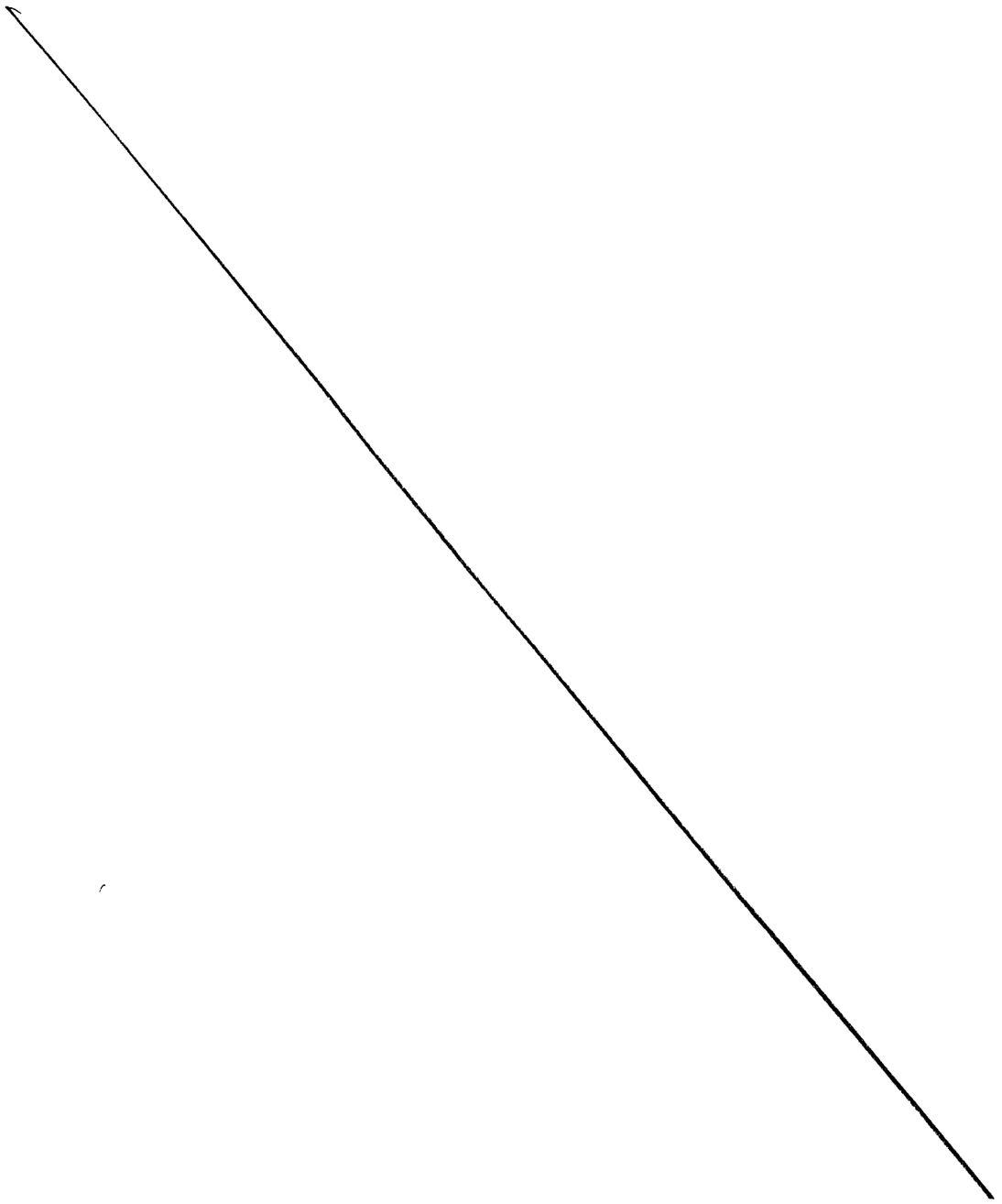
WITNESS: Yes, sir.

PRES: "Have positive up angle."

WITNESS: Yes, sir.

PRES: "Attempting to blow."

WITNESS: Yes, sir.



PRES: "Will keep you informed."

WITNESS: Yes, sir. That's correct.

Questions by counsel for the court:

Q. With regard to the time of that entry, do you recall whether you were able to check the time which appears in there?
A. Personally?

Q. Yes.
A. No, sir.

Q. You didn't?
A. No, I was devoting my full attention to the UQC, sir, and I was dependent on the recorder.

Q. And how was the reception at the time of receipt of that communication?
A. Reception was clear, sir, normal background interference, but it was clear and it come in readable.

Q. The volume was good?
A. Yes, sir, and right after he made that transmission, it sounded like he started to blow his tanks. You could hear air rushing into his tanks for about four to five seconds and then it seemed like he give it a shot of air and it just normally went right back to the normal background of the UQC, sir.

Q. Now, did your commanding officer make an observation to you at that time?
A. Yes, sir. He also said it sounded like he was trying to blow and he asked radar for contacts--any contacts--in the immediate area, and I passed to THRESHER, "no contacts in the area" in case he was trying to surface, sir.

Q. Now have you heard other subs blowing tanks while you were manning the watch on the UQC equipment?
A. Yes, sir, I have.

Q. And did this sound similar to you?
A. Yes, sir.

Q. Is there anything unusual about the sound that made it different from other similar sounds?
A. No, sir.

Q. You say it didn't continue for a very long time?
A. No, sir. It was just like if you took a shot of high pressure air and put it in an air flask. When you get that first shot--that is what it sounded like.

Q. Several seconds?
A. Yes, sir.

Q. If I were to say to you a series of numbers, could you stop me when the duration of the sounds, to your recollection, would have ceased?
A. Yes, sir, I probably could.

Q. One-one thousand, two-one thousand, three-one thousand, four-one thousand--
A. That's about right, four or five.

Q. Right in there?
A. Yes, sir.

Q. At the end of that time, would you say that the sounds ceased or that because of some other transmission you made in compliance with your captain's orders, you didn't hear it any more?
A. I didn't notice it any more after the first shot of air, sir, after that last transmission.

Q. I understand that it is diffficult for you to recollect. You didn't notice it any more. Could you say that it stopped or just that you didn't pay any attention to it?
A. I couldn't say that it stopped, sir. I wasn't paying attention to the noise at all, sir, I was listening for transmissions over the UQC, sir.

Q. Was that the last clear transmission you had?
A. Yes, sir.

Q. Was there any transmission after that?
A. He tried to send one transmission. He called us giving his call sign and ours, and then he was cut out and to the best of my knowledge, it sounded like "test depth", the last two words, but that's all. I couldn't say that was for absolutely positive but that is what it sounded like to me. He was garbled in between the call signs and the last two words of "test depth."

Q. Bearing in mind that there was a garble followed to the best of your recollection with the words "test depth," could you make anything at all out of the words preceding "test depth"?
A. Nothing, sir.

Q. You formed no opinion as to what they were?
A. No, sir, nothing.

Q. Well, again, our language has a rhythm to it, a beat. Could you say from the sound, the cadence of the garble, how ~~may~~ many words it might have been that were garbled?
A. I couldn't tell from the sound, sir, but from the time interval, from the time that he called us until I heard "test depth" would possible be one to two words, sir.

Q. One to two words?
A. In my estimation.

Q. Did you remain on the UQC equipment as its operator after receipt of that last garbled message?
A. No, sir. The Captain took the UQC and asked THRESHER if she was still in control. He said, "Are you in control?"

Q. Was there a reply to that?
A. No, sir. He asked her about three or four times. I stepped back away from the UQC and he had it after that, sir.

Q. Now, bringing your attention to the time of receipt of the garbled message and the moments during it and thereafter, did you hear any background noise of any sort?
A. No, sir, not to my recollection other than normal background noise from the UQC, sir.

Q. This was a period in which the commanding officer was relieving you of that equipment?
A. Yes, sir. I stepped back and lit up a cigarette, sir.

Q. And the quality of the sound of that last message, was it clear or distorted?
A. You mean the very last one or the one about attempting to blow, sir, the one at 0912, sir?

Q. This last one was the one I was questioning about.
A. The call signs were clear and then it seemed like it was garbled and then the last two words "test depth." That's what I thought it could be--"test depth"-they weren't absolutely clear. They were rather sort of distorted. That's what I made it out to be, sir. I wouldn't say for sure.

Q. And the volume, the volume appeared how?
A. The volume appeared to be pretty good. It wasn't real good but it was loud enough that when he called us the first time prior to his being cut out, you could understand it, sir.

Q. Now with regard to the previous message, the one that you mentioned in which the words--0912 message--
A. Yes, sir.

Q. --that you repeated to the court--
A. "experiencing minor difficulties"--

Q. Yes, now with regard to that message, was that clear and loud also?
A. Yes, sir. That one come in loud and clear, sir.

Q. With regard to that message, can you recall getting any impression as to whether it was spoken in a normal voice or a voice with emotion at all?
A. No, sir. It sounded just as if he-just what he said, having a minor problem a slight up angle. He didn't sound panicky. It was spoken in a normal voice to my knowledge, sir. He didn't sound panicky at all.

Q. Could you tell in listening to the transmissions, from the time you relieved the watch until this time, the time of receipt of the last message, whether they were transmitted by the same person?
A. The last message seemed to be in a lower voice but maybe that could have been because we had the UQC at a different volume level, sir.

Q. Now on that last message which ended--which you told us commenced with call signs--
A. Yes, sir.

Q. --followed by a garble--
A. Yes, sir.

Q. And ended in--
A. "Test depth, sir."

Q. Test depth. Think carefully now; are you certain that on that call, call signs were used?
A. Yes, sir.

Q. You are certain?
A. Yes, sir.

Q. You remember it distinctly?
A. Yes, sir. The call sign come in clear, sir. And then there was distortion after the call sign and "test depth" which I made it out to be to the best of my ability. I couldn't say for sure. I wouldn't swear that that's what was said because it was distorted a little but it sounded like that, sir.

EXAMINATION BY THE COURT

Questions by Captain NASH:

Q. When you have been operating the UQC in the past, have you noticed what happened when SKYLARK is transmitting, what happens to the reception?
A. What happens to the reception?

Q. What happens while you are transmitting?
A. It cuts out, sir.

Q. You stated that you have heard other submarines blowing air?
A. Yes, sir.

Q. Have you ever had occasion to notice what happens to their UQC transmission while they are blowing?
A. While they are blowing sir?-- It's distorted, sir. Their messages don't come in clear, sir.

Questions by RADM DASPIT:

Q. I gather that when the Captain took over the UQC, he merely took over the microphone and you were using a loud speaker to receive?
A. The UQC had a microphone and it is all in one unit. We have a receiver and a transmitter on top of each other, and it was all one unit right there.

Q. The receiver is a loudspeaker that everybody on the bridge can hear?
A. No, sir; it is just a hand mike that you talk into, sir.

Q. The reciever.
A. Oh the receiver, yes, sir, Admiral.

Q. You indicated that you had changed the volume level. I gather between the0912 and the last transmission. How did you do it and why?
A. Well, you get--sometimes you get fathometer back--well I won't call it backwash, but you get a ping from your fathometer. As a matter of fact you get it all the time when you have your fathometer on; when it hits bottom it bounces back and pings into the UQC. You can hear it through the UQC and sometimes the background noise gets worse than others, depending on how fast the ship is going. You get better reception at slower speeds, sir. If you are making two-thirds, why you have a tendency to get screw noise in a UQC. If you are making one-third, it is not as bad, and adjust the volume accordingly.

Q. Is it your recollection that you lowered the volume control?
A. Well, I didn't lower it, sir. I just adjusted it for better clarity.

Questions by the President:

Q. Mowen, I believe you said that this garbled message came in with a call sign fairly clear?
A. Yes, sir.

Q. Then it was distorted?
A. Yes, sir.

Q. And you heard the two words that you made out to be "test depth"?
A. Yes, sir.

Q. Could you describe to the court the nature of the distortion? Was it mushy or just weak, or what?
A. Well, it was crackling. Sometimes if you are around a shrimp bed, shrimp crackle, the sound comes back in the UQC. It was an intermittent crackling and then you have your regular underwater noises, but other than that, I couldn't say that there was any other distortions. It just seemed that he cut out there when something interfered.

Q. It was not a noise that you interpreted as being caused by any underwater explosion of any sort?
A. No, sir, not to my knowledge, sir.

Neither the counsel for the court nor the court desired further to examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

(b) (6) was relieved as reporter by (b) (6) ;, at this point.

(b) (6), radioman third class, U. S. Navy, was called as a witness for the court, was duly sworn, warned of his rights under Article 31, of the Uniform Code of Military Justice, informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station?
A. (b) (6) radioman third class, U. S. Navy, U. S. S. SKYLARK.

COUNSEL: This is an open session of the court; therefore, we cannot introduce any classified information. Do not volunteer any classified information, and if I ask you a question the answer to which would call for your divulging classified information, simply tell us that rather than attempting to answer the question.

Q. On the 10th of April of this year were you stationed in SKYLARK?
A. Yes, sir.

Q. And at 0800 that day what was your duty station in SKYLARK?
A. I was relieved from radio watch, sir.

Q. And you went--
A. Directly to the bridge, sir.

Q. When you went to the bridge what was your station there?
A. I was operator of the UQC, sir.

Q. You were the primary operator of the UQC, but on that day what job did you perform?
A. Mostly I logged, sir.

Q. You maintained the UQC Log at that time?
A. Yes, sir.

Q. Where were you?
A. I was standing beside the chart board, sir, keeping the Log.

Q. Was there a clock within your view?
A. Yes, sir.

Q. Where was the clock?
A. On the bulkhead to my left hand side as I stood talking to the operator.

Q. And could you see the clock?
A. Yes, sir.

Q. Could you see it well?
A. Yes, sir.

Q. Now at that time, during that watch, was the UQC loudspeaker turned on?
A. Yes, sir.

Q. And could you hear the transmissions well from about 0900 on?
A. Yes, sir.

Q. In addition to the voice transmissions were you able to hear background noise?
A. Yes, sir.

Q. How long had you been a UQC primary operator?
A. This was my second time, sir; I had done it a few minutes one time before.

Q. And how long had you been logging, or serving as a logger of UQC transmissions?
A. Just as long as I have been standing watches, sir. I've kept logs for three years, and this is the first UQC Log.

Q. The other logs that you have kept have been radio logs, have they not?
A. Yes, sir.

Q. Again, they included the function of logging the times as in UQC?
A. Yes, sir.

Q. Now I show you Exhibit 16; do you recognize it?
A. This is the UQC Log, sir.

Q. Examine it and look at the entries recorded from the time you assumed the watch at about 0800 on the 10th. Tell me whether you entered those.
A. Yes, sir, from 0800 on to 1138, sir -- to 1209, sir.

Q. You're sure of that now?
A. Yes, sir.

Q. Examine those entries and tell us whether they are accurate in accordance with things as you remember them.

A. Well, sir, there's only one thing I'm not sure of here. I started the log completely backwards from the way they did it up here (pointing to the log, Exhibit 16). I did it the way we did it in the radio room. I think this was an electronic's technician that was logging these.

Q. The call signs indicating "From" and "To" were recorded by you in the order in which you normally do for radio logging; is that it?
A. Yes, sir.

Q. But someone, somehow has "From" and "To" reversed on the top of each column, is that right?
A. Yes, sir.

Q. Just this column starting with an 0754 entry and ending with an 0912 entry?
A. Well it was turned about when I came on watch at 0800.

Q. And from there on this side where 0800 appears and through your whole watch?
A. Yes, sir.

Q. That's the only thing that differs, but except for the words "From" and "To" which relate to your entries, they are complete and accurate?
A. Yes, sir.

Q. As you recall the events?
A. Yes, sir.

Q. Now timing is very important to us, as well as accuracy. Every time you recorded an entry during that watch, as shown on the log, did you look at the clock?
A. Yes, sir, every time I marked the time I looked at the clock, sir.

Q. How did you read the clock?
A. Well, it was like the table was here and the clock is up here pointing in this direction, (the witness indicated with his hands) but I could still see it plainly and I would glance at it and get the time and log it in.

Q. Would you read to the nearest one minute?
A. Yes, sir, to the nearest one minute.

Q. In other words, you paid attention to the minute hand. If the minute hand were more than half way to the next minute would you record the earlier time or the later time?
A. If it were more than the next notch I would record the next minute.

Q. I want to make sure. If the minute hand indicated between 0905 and 0906, but it was closer to the 0906 you would record it as what?
A. 0906, sir.

Q. Please look at your log at the 0912-0914 entries; did you make those entries?
A. Yes, sir.

Q. What is your best estimate as to the time of receipt of the entry which is written, recorded as saying "Has positive up-angle", etc.?
A. Time of receipt, sir?

Q. Yes, actual time it was received. I know that you logged it. Was it received a minute before, a half minute before, or what; do you recall?
A. Well, sir, from the amount of words open it could possible be thirty seconds before it was logged, which would be 0913 thirty seconds, sir.

Q. 0913 and thirty seconds for the entry "Has positive up-angle"?
A. Yes, sir.

Q. Do you recall hearing that?
A. Yes, sir.

Q. Did you hear it clearly and without interference?
A. Well, sir, there was a little, but I was logging in something else at the time and I heard it plainly but I didn't catch what it said, and I logged in what I thought I heard, sir.

Q. This is a very difficult question to ask you at this time, but try to remember it if you can. On that entry where it says 0914, do you remember whether the minute hand was before the actual fourteen point or on it?
A. No, sir. I only had time to glance at the clock and get the approximate time.

Q. You don't recall whether it was within the one minute span?
A. Yes, sir.

Q. About that time did the Commanding Officer take over the job?
A. Yes, sir, he took over as operator of the UQC.

Q. And (b) (6) stepped out?
A. Yes, sir.

Q. Did you hear any other sound with regard to the 0914 entry? Did you hear any other sounds that you recognized, other than words? Any background sounds?
A. Well, I heard the regular UQC background noises, but I'm not too familiar with the UQC, so I can't identify them.

Q. And after that the Captain made some transmissions, did he not?
A. Yes, sir.

Q. On about 0916 did you hear anything?
A. Well, sir, there was a garbled transmission from THRESHER. We couldn't make it out, sir.

Q. You couldn't make it out?
A. Well, none of us could, sir.

Q. Do you think you could hazard an opinion as to any of the words that were uttered during this garble?
A. No, sir, I couldn't.

Q. You heard the 0917 entries then?
A. Yes, sir.

Q. With your own ears? From 0913 to 0918 is there anything you can remember that happened or that you heard besides what you wrote in your log?
A. Well, sir, there were a couple of transmissions that I didn't have time to log, like the garbled transmission; I didn't log that. The garbled transmission from the THRESHER wasn't logged.

Q. You didn't log it because you didn't understand it; is that it?
A. That's right, sir, I was listening to the UQC. If he came back, I was going to try to intercept it.

Q. Did you hear any noise, like an explosion?
A. No, sir.

Q. Did you hear any noise, like air being blown into a tank or into an automobile tire, or anything?
A. No, sir, I don't think so.

EXAMINATION BY THE COURT

Questions by court member, CAPT HUSHING:

Q. You stated that there was a garbled transmission which you did not log?
A. Yes, sir.

Q. In Exhibit 16, there is an entry which indicates a garbled transmission in which the call signs were used followed by an unknown number of words and a further indication of words that have been variously explained to this court. Are these one and the same transmission, or were there in fact two transmissions, one of which you did not log?
A. Yes, sir.

Q. There were two transmissions?
A. Yes, sir.

Q. One transmission was so garbled that no words were intelligible and it was not logged?
A. Right, sir.

Q. How much before or after the ~~lost~~ logged transmission did this completely garbled transmission come in, in your opinion?
A. Approximately one minute before this thing was logged, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. To qualify your position with relation to the location of the UQC equipment, how far away were you from the loudspeaker?
A. Approximately five or six feet, sir.

Q. Do you think others could have heard better than you, for example the operators of the UQC equipment themselves?
A. Well, sir, I was hanging onto the bulkhead. We were having some heavy rolls at the time. The bulkhead is a couple of feet away from the drawing board.

Q. And would it be fair to say that something that might sound garbled to you could have been heard by others nearer to the UQC?
A. It might have, sir.

Neither the counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of

the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

At the request of counsel, the court recessed at 1607 hours, 13 April 1963.

The court opened at 1633 hours, 13 April 1963.

All persons connected with the inquiry who were present when the inquiry recessed were again present in court.

No witnesses not otherwise connected with the inquiry were present.

Joseph Shafer, civilian was called as a witness for the court, was duly sworn informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, occupation and residence, please.
A. Joseph Shafer, (b) (6) I am a sales supervisor for the Humble Oil and Refining Company.

Q. Mr. Shafer, I understand that you have volunteered to come before the court because you have information which you think may be of possible use to us in this inquiry; is that correct?
A. That's correct.

Q. Are you related to any members of the crew of the THRESHER?
A. Yes.

Q. Please explain.
A. Both of my younger brothers, Benjamin and John were chief electricians on the THRESHER.

Q. Can you identify their ratings?
A. Ben was a Master Chief and John was a Senior Chief.

Q. The information you have to give us originated from your discussions with them?
A. That's correct. Over a period of several months, while both of them have been on the ship.

Q. Please give us that information in your own words.
A. Well, as you know, Ben has been on the ship for some thirty months or so, and John for a lesser period of time. These two boys were very different in their personalities, which has a bearing on what they said. My brother Ben was very much a Navy man, more so than John was, and to the degree that he would never say anything which was detrimental to the service in any way, and I'm not intimating that John would. It's just that their personalities were slightly different. When they went on the ship they were extremely enthusiastic about it. They both thought that it was the finest ship in the Navy and expressed this many different ways. As time wore on, and as the ship went through its various tests and ended up in Portsmouth here to be overhauled, John's attitude changed slightly, in that he seemed to be apprehensive. Maybe that's the wrong word, maybe I should say he was not sure that the crew or the people that worked on the boat were doing this correctly. This is an impression that I drew; I can't give you anything concrete that he said, whether it would be a fact or anything else. All I know is what they were discussing, and this was not one discussion. I want you to understand that this was over a period of several months, maybe two years. As I've told you, I live in Ohio and I get over here about once every three months, or so, and it was during these times I've always been fortunate enough to have been home at the same time that my brothers were, and because they were on the same ship and because they lived within the same vicinity quite often we were together on these visits. These two boys were strictly Navy; they never said anything that would be classed as detrimental in any way. It was only an attitude that seemed to grow in one direction, and it progressed and got to the degree where they were more or less kidding each other about it. "I wonder what's going to be wrong when we go back this weekend" or "I wonder what we'll do this weekend that will be different". On several occasions after they had gotten home, or gone home on a liberty, they would be called back, and particularly in Ben's case, because I don't know for sure, but I think he said he was more or less in charge of the reactor or the reactor room. On his last visit, this last weekend when they were home, I wasn't there. I was in Ohio. I came over just this week, so I can't tell you what they said this weekend, except that I got it second hand from my father and my mother, and from Ben's wife and from John's former wife. If you want me to tell you what they said to me I'll be glad to tell you, but it's not first hand information; it's information that I got from them.

PRESIDENT: It would help us a little bit, Mr. Shafer, if you would identify what you mean by home. Is it this vicinity or Ohio?

WITNESS: No, here. Nobody in Ohio has anything to do with this ship. I'm the only one in the family that is out there.

PRESIDENT: So when you say home in your statement you have meant in this vicinity?

WITNESS: In Groton, Connecticut. They all live in Groton. First of all, my brother Ben's wife, whose name is Joyce, said that, and this was in the presence of her father, that when the boys left Sunday afternoon to come back up here to Portsmouth, John came out of the house and shook hands with Mr. Mangin, who is Joyce's father, and he said, in more or less a kidding way, according to Mr. Mangin, "Well, I'll see you later, John" and John said "I don't know whether you will or not", so he turned to Ben and said "How about that Ben" and Ben said nothing, he just shrugged his shoulders and they got in the car and drove away. Now all this is second hand. I don't know; all I know is what they told me, and of course all of the whole family is grief stricken and this may be emotion. I don't know. I'm not trying to give you any false information; this is strictly what they said. My dad hasn't said anything; he's not in any condition to say anything, but I know that he is -- I don't know what else I can say about him. He just hasn't been able to do any talking; I haven't been able to talk to him. The boys were enthusiastic. They wanted to be where they were and nobody in the family is holding anybody responsible. We feel that they wanted -- they did what they wanted to do and I'm sure that the boys would have gone had they known what was going to happen. They just were both dedicated to the service and they had no other interests. They wanted to be together. They wanted to be on atomic submarines, and I'm sure they got what they wanted. I don't mean that they wanted to die, but they wanted to be on that ship. I don't know anything else I can tell you that will be of any value.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. Mr. Shafer, have you ever been in the Navy?
A. Yes, I was a chief in the Navy in World War II; I was a Quartermaster.

Q. Were you in submarine?
A. No, sir; I was on landing craft, LST's.

Q. Most of your information that you have is in context of what you observed as a Navy man talking to another Navy man? Is that correct?
A. Yes, sir. My dad was a Navy man; my dad was a boatswain's mate in World War I, and the whole family has been in the Navy.

VADM Austin: Mr. Shafer, I'm sure that I speak for the court when we express our deepest sympathy to your father and you and all of your family, including the wives of the lost brothers, and we do appreciate your coming and giving us this information. There is only one thing I would like to clarify and this is the particular specialties of your brothers. You said that one was a Master Chief and the other a Senior Chief. Were they Electrician Mates, both of them?
A. Yes, sir. I believe John was EMCS and Ben was EMCM, or something like that; I'm not sure. Ben had two stars above his insignia and John was trying to make that rate. I think they were only one rating apart, if I'm not mistaken. I want you to understand too, further, that nobody in my entire family is casting any aspersions against anybody; we're not here for that purpose. Nobody is trying to say that the ship wasn't right, and we sincerely believe that it was, because all of us have enough faith in the Navy to know that it wouldn't have gone to sea if it wasn't, and this is the way we feel about it, but these attitudes and things that I have mentioned to you were so strong and all in the same direction that it just seemed to me that they should be mentioned; that's all, and I don't think I can express it any more clearly.

Neither the counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anying relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

David Main, a civilian, was called as a witness for the court, was duly sworn, informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Please state your name, occupation and residence.
A. David Main, (b) (6) I'm a welder at the Electric Boat Company.

Q. Mr. Main, I understand that you have requested to come before the Court of Inquiry because you feel that you have some information which may prove of value; is that correct?
A. Yes.

Q. Were you related to any members of the crew of the THRESHER?
A. Yes, John and Ben were my brothers-in-law.

Q. They were married?
A. Their sister is my wife.

Q. Will you state in your own words the information that you have for the court?
A. Well, John lived in my backyard for the last two years, and I, being a welder and in the field that he is -- I spent thirteen years welding at the Electric Boat Company -- so now and then we would just talk about fundamentals of our jobs. For the past several months, I would say at least five months, it seems to be that he mentioned he was dissatisfied with certain phases of piping, the way it was going. There seemed to be a big amount of rejects after the X-rays. This would happen once in a while and I didn't think anything of it, but last Sunday he was at my house and out of the clear blue sky he said to me, "Dave, THRESHER is in such a mess that I don't think EB could straighten it out." Prior to this we used to have more or less a standing joke. I work at EB and I used to tell John "Get on an EB boat if you want a good boat", so I said "Well, I told you, you should have got on an EB boat." Of course, I didn't think too much of it at the time, but I wanted to tell you. That's all I have to say.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Osborn:

Q. Do you have any submarine experience at all?
A. Never, beyond working on them. I've worked on submarines ever since TRIGGER, TROUT, HARDER, the NAUTILUS and the Polaris Boats, etc. Right now I'm a research welder.

Questions by the President, VADM Austin:

Q. Mr. Main, did your brother-in-law Benjamin, ever express a similar feeling within the last five months?
A. I didn't see Ben nearly as often as I saw John. He was more interested in the real technical aspects of it, which is way beyond my understanding.

Q. Now you mentioned that John was concerned about the way the pipe was going?
A. Yes, he said to me on several occasions that it seemed like they were having a high number of rejections.

Q. Could you indicate any particular part of the piping he was more concerned with than any other?
A. Well, I couldn't say the exact system, but I could say it would be more in the reactor room than any place else.

Q. Piping in the reactor room is where he seemed to be most concerned?
A. Yes, he never said a certain pump or anything like that.

Neither the counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

No, all I say is that I'm happy that I've had the chance to come here.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The reporter (b) (6) was relieved by (b) (6) at this point.

(b) (6) relieved (b) (6) as reporter at this point.

Donald H. Kern, Captain, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Captain Kern, although it may be unnecessary, I would like to remind you that this is an open session of the court and that no evidence of a classified nature should be given here. Should I or any member of the court ask a question which, in your judgment, requires an answer containing classified information, I would ask that you so indicate rather than give that answer. Do you understand?

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization, and present duty station.
A. Donald H. Kern, Captain, United States Navy, Head of the Submarine Branch, Bureau of Ships.

Q. Please give us a brief resume of your background and professional qualifications.
A. I was graduated from the Massachusetts Institute of Technology in 1942 with a Bachelor of Science Degree in Naval Architecture and Marine Engineering, I went immediately into the Navy as an Ensign and was assigned to the Boston Naval Shipyard--

PRES: Captain, let me interrupt. In the back they are having a little trouble hearing, so if you will just raise your voice level, they will be able to hear your testimony.

WITNESS: Yes, sir.

(By counsel for the court)

Q. Proceed.
A. I was assigned to the Boston Naval Shipyard as Ship's Superintendent handling new construction work on destroyers and LST's I went from there to the Pacific and served with Commander Service Force in connection with hull repairs as Hull Repair Officer for that Staff. My next tour of duty was with the Pearl Harbor Naval Shipyard as a Planning Officer handling hull work again. I was assigned at that time for graduate study at the Massachusetts Institute of Technology and I spent three years in further study there and received an Engineering Degree, a Masters Degree, and from there I was assigned to the Portsmouth Naval Shipyard.

Q. May I interrupt at that point? With regard to the post-graduate work at the Massachusetts Institute of Technology, was that work directed at any particular specialty?
A. Yes. That was directed towards hull design, structural design, and in particular, in the last year I specialized in submarine design. And my thesis was done in that area.

Q. All right, proceed.
A. I was assigned to the Portsmouth Naval Shipyard as Ship Superintendent on submarines, and I went on into the Design Division as Assistant Design Superintendent, and finally as Design Superintendent.

I left Portsmouth about 1955, when I went on to the Bureau of Ships as Project Officer for nuclear attack submarines of the NAUTILUS, SKIPJACK and SKATE class. I was then assigned to the Design Division of the Bureau of Ships, where I served in the capacity of Project Officer for POLARIS 608 submarines. I was assigned in 1959 to the Staff, Submarine Force, Atlantic Fleet as Force Material Officer, and in that position was responsible for the engineering readiness of Atlantic Fleet submarines. which included the THRESHER.

Q. Captain, are you fully familiar with the design specifications and the actual physical characteristics of the hull of THRESHER class submarines?

A. Yes.

Q. And in particular with the U. S. S. THRESHER?

A. Yes.

Q. Based upon your expert knowledge and experience in this respect, regardless--I would like to ask you--Based on your knowledge in this respect, I would like to ask you this question: Regardless of how a casualty occurred, if a ship of THRESHER's specifications went down to the bottom in approximately 8400 feet of water, what would be the effect on her hull?

A. There is no question that the hull would be completely flooded, that any internal compartmentation would be destroyed, that there would be no compartment remaining in the ship that would maintain human life, and the hull would very likely be ruptured in one or more positions.

Q. Under those circumstances, would it be likely that debris would rise to the surface?

A. I would say that there would be every possibility that debris would come to the surface; that a submarine at that depth would have had various fixtures, compartments near the upper portion of the submarine collapse or implode because of the depth. Such fixtures as the masts, the escape trunks, which are more or less isolated from the main compartments of the submarine, the bridge access trunk- all of these, on imploding, could tear the pressure hull and could leave a hole where they once were located, and through these holes the water would drag the debris out, and the debris would appear on the surface.

Q. You have testified that debris would be likely to rise to the surface as a result of such a hull rupture. Would the presence of debris therefore, lead to the conclusion that hull rupture was a cause of the sinking?

A. By no means. Irrespective of how the submarine transited beyond its collapse depths--once it went beyond that depth, you would have hull rupture, but you can't conclude that hull rupture was the primary cause in the first instance.

Q. At 8400 feet, or thereabouts, then, would you say that the loss is total and under all conditions some debris is likely to rise to the surface?

A. Yes. The loss can't be anything else but total. Debris would undoubtedly be found.

COUNSEL: I have no further questions, sir.

PRES: Any questions by the court?

EXAMINATION BY THE COURT

Questions by a court member, CAPT Nash:

Q. I believe you have made it clear that there could be two situations here that really we don't yet have any knowledge of as to what caused-- We don't have anything that would indicate to us yet what caused the submarine to go beyond its collapse depth; is that correct?

A. Yes, sir. From what I know of the situation, I don't know of any way to determine with the information at hand the cause of the casualty which caused the submarine to go beyond its test depth. As you develop further information, this may be possible, but I don't know of anything that is known to me that would allow me to do anything but speculate as to the hundreds of ways a casualty could occur to take the submarine beyond its test depth.

PRES: We have no further questions.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to add.

The witness was duly cautioned concerning his testimony and withdrew from the witness stand but remained in the courtroom.

COUNSEL: I call Lieutenant Sousae.

Jack Sousae, Lieutenant, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Lieutenant Sousae, this is an open session of the court, and for that reason, it is not desired that any information be announced here of a classified nature during the open session. You should, therefore, refrain from volunteering any classified information, and if any question, whether by counsel or by the court, should, in your opinion, require an answer which contains classified information, you should not answer the question but should first indicate that fact.

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization, and present duty station.

A. Jack Sousae, Lieutenant, U. S. Navy, Staff DEPCOMSUBLANT, New London, Connecticut.

Q. That is, Deputy Commander Submarine Force, U. S. Atlantic Fleet?

A. That's correct.

Q. Would you please spell your name for the record?
A. S-O-U-S-A-E.

Q. In connection with this inquiry, do you have some objects in your custody to present to this court for its consideration?
A. Yes, sir.

Q. If so, produce them.
A. I have them here.

The witness produced the said objects.

Q. How did these objects come into your possession?
A. I received these objects from the U.S.S. ROBERTS yesterday morning at 0830 in Newport, Rhode Island.

Q. And they came into your possession, having been received by ROBERTS how?
A. I understand ROBERTS received these from the U.S.S. SKYLARK.

Q. And the SKYLARK...?
A. I am told the SKYLARK got these from the surface of the ocean in the area of this mishap.

COUNSEL: I offer these objects to the court for the purpose of introducing them into evidence.

PRES: The court has seen all of those and has no objection to their introduction into evidence.

The said objects were submitted to the court and were offered in evidence by counsel for the court. There being no objection, they were so received in evidence and marked for identification as indicated below.

COUNSEL: I request that the reporter mark these objects individually as exhibits.

The objects were marked as follows:

Exhibit 22: A bottle and contents, the numeral "1" appearing thereon.

Exhibit 23: A bottle and contents, the numeral "1A" appearing thereon.

Exhibit 24: A bottle and contents, the numeral "2" appearing thereon.

Exhibit 25: A drinking glass and contents, the numeral "3" appearing thereon.

Exhibit 26: A drinking glass and contents, the numeral "4" appearing thereon.

Exhibit 27: A yellow glove of rubberized material.

Exhibit 28: An orange glove of rubber material

Exhibit 29: A plastic tube, with screw cap missing marked "Baker's" and other words.

Questions by counsel for the court:

Q. Do you have anything further to offer this court in the way of evidence?
A. I would like to say that I was told that the containers were provided by SKYLARK, and only the contents of the containers was found on the surface.

COUNSEL: Thank you. I have no other questions at this time, sir.

PRESIDENT: This witness is not competent to answer questions for us as to what these things are?

COUNSEL: No, sir. He merely shows some continuity of possession.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: I think there is only one pertinent point, Admiral. I received this material intact in the plastic bag. Once I got it in my custody, I did check it to see that it was clear of any radioactivity hazards.

PRESIDENT: And did you find it was free of radioactivity?

THE WITNESS: Yes, sir, it was absolutely clear.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

COUNSEL: I call Mr. F. L. Downs.

Mr. Frederick L. Downs, a civilian, was called as a witness for the court, was duly sworn, was warned of his rights against self-incrimination, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Mr. Downs, this session of the court is open to the public, and therefore, it is not desired or permitted that any classified information be brought forth. You should, therefore, not volunteer any information which you believe to be classified. If the question put to you by any member of the court or counsel for the court should, in your judgment, require an answer involving classified information, then you should not give the answer but should, instead, state your belief that the answer would be classified.

THE WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address, and present occupation.
A. My name is Frederick L. Downs, (b) (6)
I am a Rubber Technologist presently employed as Head of the Polymers Research Section, Portsmouth Naval Shipyard.

Q. You spell your name D-O-W-N-S, is that right?
A. That's correct.

Q. Mr. Downs, what is your background in this specialty at which you work in the Portsmouth Naval Shipyard?
A. Well, I've been working in rubber technology only since about 1926. Back in my student days, I was a student in the Bureau of Standards in Washington, D. C. in the Rubber Division. I'm a graduate of George Washington University, with an A.B. degree in Chemistry. I took a position in 1932 with the Thermoid Rubber Company, and remained there with them as Chief Chemist until 1935. In 1936 I accepted a position as Chief Research Chemist in rubber for the American Steel and Oil Company, Electrical Cable Works, in Worcester, Massachusetts. I remained there until 1942, when I was sent by the Government to Brazil, where I established a laboratory for the rubber program in Beylang (?), Brazil. This was a joint effort for the United States Government and the Brazilian Government. I remained there until 1945, when I returned to the American Steel and Oil Company to my former position. I left there in 1947, when I came to my present position.

Q. As a civil service employee of the Shipyard?
A. Yes, sir.

Q. In connection with your duties in that regard, did you have occasion to make a series of tests on any of the exhibits which I show you at this time (showing the witness Exhibits 19 through 29 inclusive)?
A. I did.

Q. If so, will you identify which exhibits and tell the court the material and the results of the tests which you performed on each one?
A. Yes, sir.

Q. Do these represent all of the items which you examined?
A. This is all we examined until now. We have others under investigation. I have looked at this group and this group.

COUNSEL: Let the record show that the witness indicated 27, 28 and 29.

THE WITNESS: Some of this material.

COUNSEL: The witness has indicated some of the contents of the bottle marked Exhibit 24.

THE WITNESS: All of this material.

COUNSEL: All of the contents of the glass marked Exhibit 26.

THE WITNESS: The two pieces of white plastic and the dark object, but not the smudges.

COUNSEL: The two pieces of light plastic and a dark object included in Exhibit 25, but not the smudges, or smears, appearing on the side of the container.

Questions by counsel for the court:

Q. Please indicate what the results of your tests indicated?
S. May I refer to my notes?

Q. Yes, you may refer to your notes to refresh your recollection, but your testimony is your own remembrance, is that correct?
A. Yes, sir. There are several items in here that could be identified.

Q. You are now referring to the contents of Exhibit 24?
A. Yes, sir. The first one which I can readily identify is the brown object. This is a piece of brown plastic--

COUNSEL: Would the court prefer that the witness draw closer to the court for the purposes of his testimony?

PRESIDENT: Yes.

COURT: Mr. Downs, would you step up here before the court?

THE WITNESS: I refer to this piece of brown plastic. This material was thought to be a material which is used in microballoons, which is used to lighten-- In this case polyester resin. I made identification of this material. This is obviously the same material known to have been used on the THRESHER. I was able to identify this by microscopic examination only, but in comparing a small piece of this material from samples which were used on this particular boat, they were found to be identical in structure and appearance. We felt no further identification was needed.

PRESIDENT: Am I clear in understanding, Mr. Downs, that by microscopic examination of this little piece of brown sample and by comparison of that sample with a patch of material that is known to have been used in THRESHER, you are without any doubt in your own mind that this particular sample did come from the THRESHER?

THE WITNESS: No, sir, I can't guarantee it came from the THRESHER.

PRESIDENT: But it was the same material as was placed in THRESHER?

THE WITNESS: Yes, sir.

PRESIDENT: All right, proceed.

Questions by counsel for the court:

Q. Proceed, Mr. Downs.

A. I now refer to the white substance. There were two pieces of it. We sectioned a small piece from one of those, and this was thought to be a polyurethane foam of low density. Here again, microscopic examination and comparison with material of known composition - that is, a sample of 6-pound density polyurethane foam - revealed that they are identical. We ran a pyrolysis test on this material by lighting a match to it and allowing it to burn for a second, and it has a characteristic odor identified as polyurethane material. The third material--

PRESIDENT: Before we go into the third material, are there any questions by the court?

(No response.)

PRESIDENT: Very well, proceed.

THE WITNESS: (Referring to the contents of Exhibit 24) The solid material here was thought to be cork, and it was very obviously cork. My associate tested this. And the other material, I have nothing to-- no information on that other material.

Questions by counsel for the court.

Q. Which one would you like next?

A. Here again (referring to the contents of Exhibit 25) we have several pieces of white material, evidently plastic foam. This was thought to be identical with the light low-density material I previously spoke about. This was identified by the same method of examination - microscopic and burning. It was established to be polyurethane foam. This other material was identified as cork. The smears in here I could not identify.

Q. I hand you Exhibit 26.

A. This light yellow colored plastic was first thought to be borated polyethylene. However, on testing, this gave a typical paraffin smell which is peculiar to polyethylene. To establish that it was borated polyethylene, another test was made by the other chemist, about which I am unable to testify. Again, we have some dark colored material here which was obviously cork. The larger sample of gray-white plastic was noticed to have embossed letters on it. We tried to identify this. We could distinguish the letters "POL--" on one line, and it was obliterated from there on. And under that, in similar characters, were the letters "PRIN--" This was something which we had no lead as to what it might be. Fortunately, someone brought in a piece of material which looked exactly like it, and it was found to be a little roll of Polaroid film developing device. This was identical and was similarly embossed with the words "POLAROID" and "PRINT". It was examined and found to be the same material.

Q. I now hand you Exhibit 28.

A. This glove was simply described in our report as having been stained with a colored paint. The glove is obviously a rubber glove. It is a large rubber glove of a type recognized by everybody as the type used aboard submarines. So we made no further comment on it.

COURT MEMBER, CAPT Hushing: Is there any Navy stock number identifying this glove?

THE WITNESS: I understand there is, but I do not know that of my own knowledge.

Questions by counsel for the court:

Q. And I show you Exhibit 27.

A. This glove was subjected to our examination also. It needed no identification since it bore markings which identified it as a neoprene rubber glove. Experience tells me that this is neoprene latex, so it needed no further identification. The maker of the glove was the Miller Rubber Company. It doesn't ring any bell with me as to what it might have been used for.

Q. I show you Exhibit 29.

A. This plastic tube was not identified chemically since there was nothing of any interest contained in it. It was identified by its label. It is nothing more than a tube containing icing, I presume, to decorate a cake, manufactured by the Baker Flavoring Company. I think that completes that group.

Q. Now, referring to this other group of exhibits, and I show you Exhibits 19, 20 and 21, previously introduced before this court. Did you perform any tests on those three items?

A. Yes, sir, on this one and this one.

COUNSEL: Let the record show the witness referred to Exhibits 19 and 21.

Q. Would you explain to the court what your tests indicated with regard to those exhibits?

A. This object (Exhibit 19) is a float of some sort, I presume. It appeared to be a plastic similar to the plastic material which I previously described. There are no markings to identify it. We simply measured the thing. I cut a chip from this object and put a pyrolysis test on it, and found that it would not support combustion. It will burn as long as a flame is held under it, but it is self-extinguishing as the flame is removed. It had a strong odor of burning rubber as it burned. Thirdly, as is characteristic of plastic, this material did not drip. This indicates it is some sort of rubber. Since it did not melt, the obvious conclusion was that it is a rubber containing chlorine. So I ran a Beilstein test on it to establish the presence of Chlorine, with positive results. This test consists of burning a small sample in a flame under a piece of copper. If the flame turns from its normal yellow color to a pale blue-green, it indicates the presence of chlorine. This proved to be a positive test; therefore, it was determined to be neoprene, and its structure indicates it is foam. Therefore, it is a rigid neoprene foam.

Q. I now show you Exhibit 21.

A. Remarks on this will have to be made both by myself and my associate. This material is quite obviously borated polyethylene, and we established proof of this by test. This was done by pyrolysis, simply by taking a patch of this and burning it under a low-density flame. As it burned it gave off a strong odor of paraffin. This is an indication of polyethylene. Whether it is borated or not, my associate will have to testify to that fact.

Q. Does that conclude an account of the tests which you performed on these items, Mr. Downs?

A. Yes, sir. I did identify these gloves just by sight.

Q. With regard to Exhibit No. 20, you examined them visually and determined them to be two rubber gloves?

A. That's right. They are rubber latex.

Q. Now, Mr. Downs, in connection with the tests which you performed, did you prepare a written report of that?

A. I did, sir.

Q. In collaboration with a Mr. Carrigan of the Chemistry Section?

A. Yes, sir.

Q. I show you this report; is that your signature?

A. It is.

Q. So far as your contribution is concerned and as you have related them in court, is this a true account of the tests which you conducted?

A. It is.

COUNSEL: I show this to the court for the purpose of introducing the written report in evidence.

The said report was submitted to the court and was offered in evidence by counsel for the court. There being no objection, it was so received in evidence and marked "Exhibit 30."

Q. That report covered one group of the exhibits which we treated as two groups?

A. That's right.

Q. Did you, in the same way, prepare a report in regard to the various items contained in the other group?

A. Yes, sir.

Q. I show you this report; does this clearly reflect the results of your examination of this second group of objects?

A. It does.

COUNSEL: I offer this report in evidence.

The said report was submitted to the court and was offered in evidence by counsel for the court. There being no objection, it was so received in evidence and marked "Exhibit 31."

COUNSEL: I have no further questions of this witness, sir.

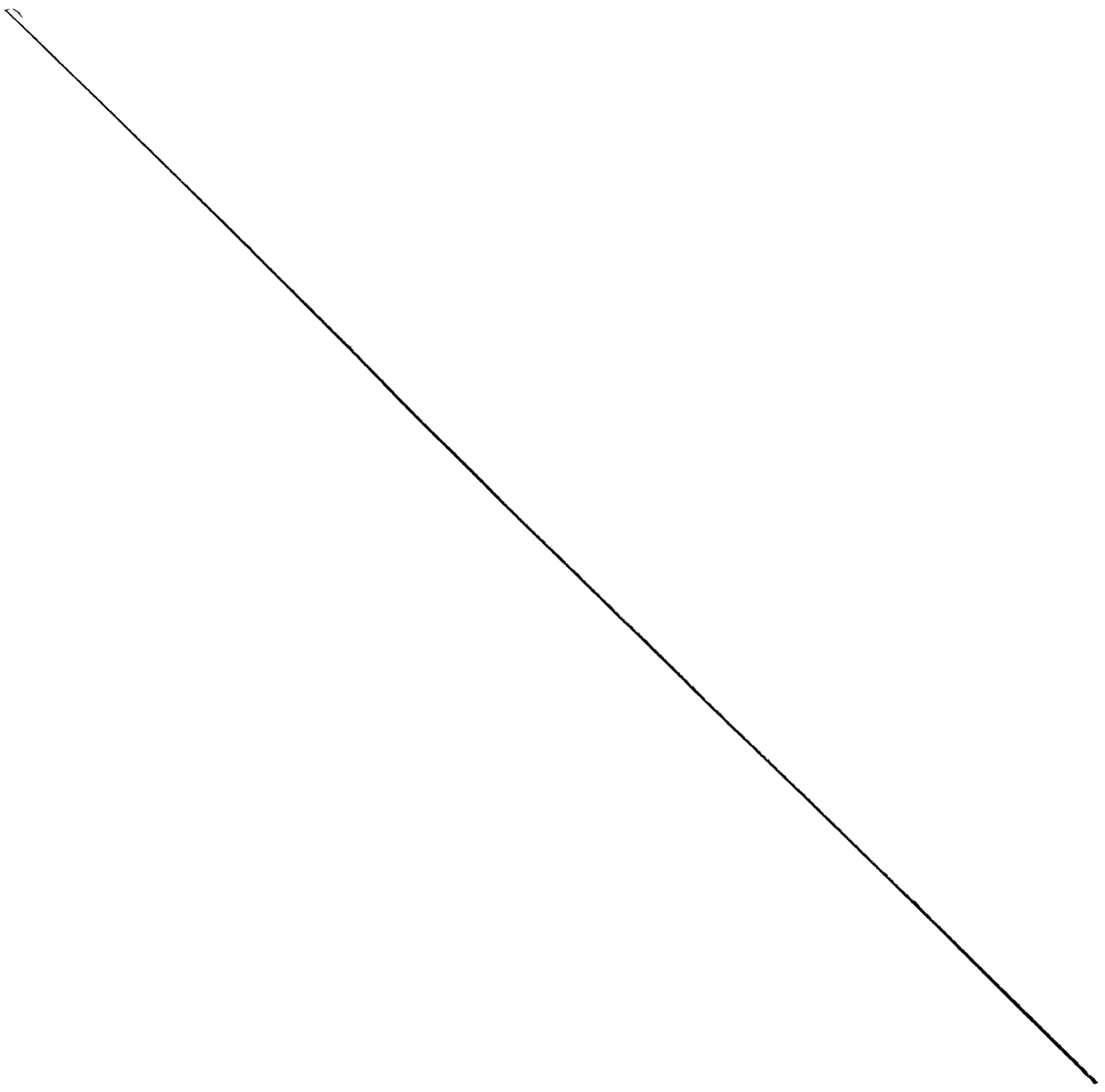
PRESIDENT: We have no questions.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to add.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.



(b) (6) relieved (b) (6) as reporter at this point.

John E. Carrigan, 4 Crockett Street. Rochester. New Hampshire. was called as a witness for the court, was duly sworn, was warned of his rights against self-incrimination, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Mr. Carrigan, this is an open session of the court and the public is admitted; therefore, it is necessary that no classified information be divulged at this session. I would request, therefore, that you not voluntarily divulge any classified information and, if in your judgment the answer to a question put to you by a member of the court or counsel for the court would require the inclusion of classified information in an answer to make it complete, you should not answer the question but should so indicate. Do you understand, sir?

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Please state your name, address, and present occupation.
A. John E. Carrigan, Materials Testing Laboratory, Portsmouth Naval Shipyard, Head of the Chemical Section.

Q. And your address?
A. (b) (6)

Q. Do you spell your name C-A-R-R-I-G-A-N?
A. I do.

Q. Mr. Carrigan, in connection with your duties as the Head of the Chemistry Section in the Shipyard, please give us a resume of your educational qualifications for that specialty.
A. I received a Bachelor of Science Degree from the University of New Hampshire in 1932. In addition to that, I have had specialized training in X-ray and optical spectroscopy. I have had a total of about twenty-five or twenty-six years in either general or analytical chemistry, twenty-three of which were served here at the Naval Shipyard.

Q. Pursuant to your duties at the Shipyard, did you have occasion to perform any tests on the materials which I now lay before you; and, for the record, these are the same materials previously laid before and testified about by the last witness?
A. I ran tests on some of these materials.

Q. Will you indicate with respect to the articles which I place before you whether you performed tests on any of them?
A. I ran tests on these two, on this one here, and on this one here.

Q. Taking them one at a time, would you describe to the court the nature of the tests which you performed and the conclusions which you reached concerning them? In each case could you identify the exhibit by the tag number?
A. Exhibits Number 22 and 23, samples from each of these bottles were combined and treated as one sample. Oil, if present, is extracted by an ether extraction process. After the extraction, I verified the fact that the residual material was sea water by checking its chloride content and its specific gravity. I evaporated the ether residue and examined the residue under ultra-violet light and observed that it displayed a definite

fluorescence. I then weighed the residue, burned it, reweighed it, reexamined it under ultra-violet light, found that it had both lost weight and lost its fluorescence. I calculated the loss in weight as oil and calculated it to be 43 parts per million. That concluded that test.

Q. You say you found it to be oil?
A. Yes, sir.

Q. Could you determine the nature of the oil?
A. The actual amount of oil was so small that an exact type identification couldn't be made, but I judged the oil to be a lubricating type of oil rather than a fuel oil because the film covered such a large area for the relatively small amount of oil present.

Q. Please proceed?
A. In Exhibit 24, I examined some of the gross particles in here, observing them under a microscope, and taking a density reading, and from those observations concluded that the material was cloth. I took a weighed sample of the oily material, extracted it with benzine, evaporated the benzine extract, weighed the residue, and determined that the material was 98.4% oil. I further subjected the residue to tests usually given to determine whether, let's say, straight mineral or compounded oil. The results of those tests indicated that it was a straight petroleum product. The balance of the sample was examined spectographically and found to be made up of several different metallic elements of which iron was the principal component. Calculated as oxides, the results of the tests indicated that iron oxide constituted 86% of the material, calcium oxide 4%, magnesium oxide 2%, silica 2%, sodium oxide 2%, vanadium oxide 1%, copper oxide 2%, aluminum oxide 1%, and traces of titanium, boron, manganese, chromium and nickel were also observed. That was the extent of that test.

Q. With respect to the petroleum type oil, traces of which you found, did you come to a conclusion as to whether that was a lubricating oil or other type?
A. It resembled a type of lubricant which could be a gear type lubricant. It was a very tacky material and extremely dark in color. There again, there is a very, very small sample and a positive absolute identification couldn't be made.

Q. Do you have any further observations to make with respect to the first group of exhibits which is laid before you?
A. Well I made one more test. I tested an off-color piece of material which turned out to be polyethelyne. I checked this by spectographic analysis likewise, and found that it was a non-borated type of polyethelyne that did contain titanium an and an element which is quite often used as a pigment in material of this type. And that, sir, is the extent of that.

Q. Does that testimony relate to Exhibit 26, sir?
A. The material which I tested is not in here.

Q. Where did you find that material?

Exhibit 26 was turned bottomside-up and the attention of the witness was invited to its contents.

A. There, that material there. It's the off-color.

COUNSEL: The witness indicated a small piece of material of a yellow pigmentation included in Exhibit 26.

WITNESS: That's the extent of the test, sir, I made on that.

Q. On this first group of exhibits. I show you the second group of exhibits. Did you make tests on any of these?

A. I did, sir, on Item 21, the yellow plastic, and found it to be a borated polyethylene type material, the boron content being 1.28%.

Q. Does that conclude an account of your tests on those items?

A. Yes, it does.

Q. Did you sign a report covering tests on each of the two groups?

A. Yes, I did.

Q. I show you Exhibits 30 and 31; do they contain your signature?

A. They do.

Q. Do they accurately represent a summary of the tests which you performed?

A. Yes, they do.

Q. Can you tell us from your expert knowledge whether any of the materials which you tested were similar to materials used in submarines?

A. I have tested polyethylene in the past submitted by the Nuclear Power Division prior to what I understood to be installation on a submarine. Of all the materials before me, that would be the only one that would fall in that category.

Neither the counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he did not believe he could add anything to what he had already testified.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Anthony C. Faskianos, (b) (6) was called as a witness for the court, was duly sworn, was warned of his rights against self-incrimination, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Mr. Faskianos, this is an open session of the court and the public is present--members of the public are present. For that reason it is necessary for you not to divulge any classified information. We would ask you, therefore, not to volunteer any classified information in your testimony, and if a question put to you by a member of the court or counsel for the court should, in your judgment, require classified information in a reply to that to make it complete, do not give the reply but instead so indicate. Do you understand this?

WITNESS: Yes, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Please state your name, address, and present occupation.

A. Anthony Charles Faskianos, (b) (6)
I am Head of the Radiological Monitoring Section, Nuclear Power Division.

Q. How do you spell your last name?
A. F-A-S-K-I-A-N-O-S.

Q. Mr. Faskianos, in connection with your official duties at the Shipyard, did you have occasion to perform any tests on the articles which I show you at this time?

COUNSEL: Let the record indicate that the articles placed before the witness are the identical articles placed before the previous two witnesses.

A. Yes, sir, I did.

Q. What was the nature of the test which you performed on them?
A. Performed a Beta Gamma and Alpha Radiation Level Test on the items that are on the table.

Q. Give us a resume of your educational and professional background in the field of radiological measurement?
A. I have a Bachelor of Science Degree in Physical Science and have been employed at Portsmouth Naval Shipyard since 1958 in the radiological monitoring field.

Q. I show you these articles in two groups. The first group consists of Exhibits 23, 24, 25, 26, 22, 27 and 28. Describe the tests which you performed on these exhibits and the results thereof?
A. All of the exhibits were scanned with a Beta Gamma Survey Instrument, an AN/PDR-27-J. All results were background. The items were also surveyed for Alpha using an AN/PDR-56, and no detectable Alpha was present.

Q. With respect to the statement that all results were background, can you explain that in layman's language, please?
A. When at any time that you count the BETA GAMMA with a Geiger Counter, you always get a slight indication because of cosmic radiation. The readings that we found on these items were not above the natural background of cosmic radiation.

Q. Now I show you the group of exhibits marked 19, 20, and 21; did you perform a test on these?
A. Yes, sir.

Q. The same tests?
A. The identical ones.

Q. Would you please tell us what you found?
A. The results were identical with the first group. The BETA GAMMA readings were background; the ALPHA was non-detectable.

EXAMINATION BY THE COURT

Questions by the President:

Q. Mr. Faskianos, your answers to the questions are interpreted by me to mean that these items tested give no more evidence of atomic or radiological contamination than any objects that you might go out and pick up in the road here would give. Am I correct in that interpretation of your testimony?
A. Yes, sir, according to the Shipyard Regulations.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to state.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

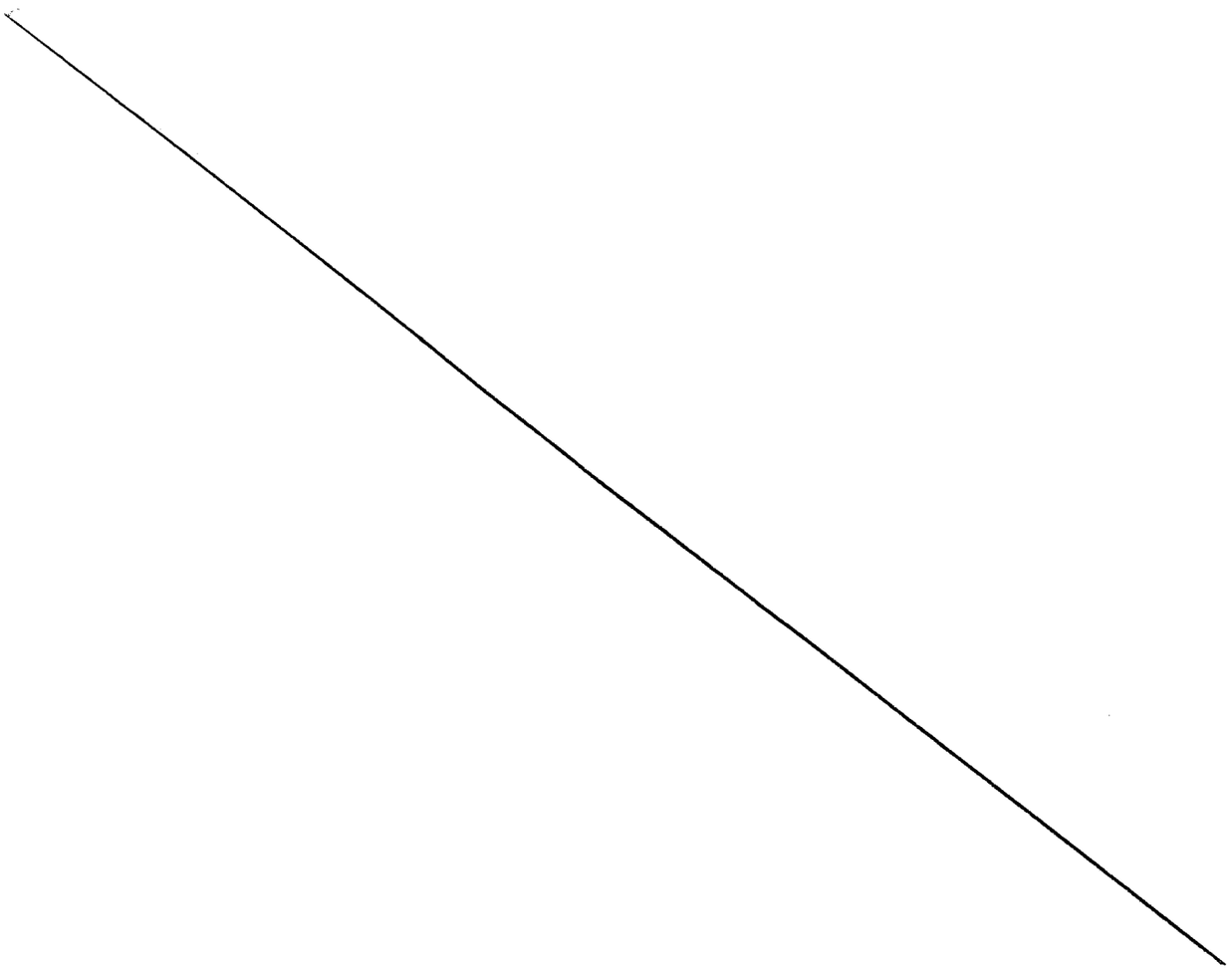
COUNSEL: I have no further witnesses at this time, sir.

PRESIDENT: Well, if you have no further witnesses at this time, and the hour is getting late, do you have reason to wish to call other witnesses tonight?

COUNSEL: No, sir, I do not.

PRESIDENT: In that case the court will adjourn until Monday morning, ten o'clock.

The court adjourned at 1810 hours, 13 April 1963.



FOURTH DAY

Portsmouth Naval Shipyard,
Portsmouth, New Hampshire,
Monday, 15 April 1963.

The court met at 1000 hours.

All persons connected with the court who were present when the court adjourned were again present in court except (b) (6) who was relieved by (b) (6) as reporter.

Commander Charles R. Davis, U.S. Navy, was duly sworn as assistant counsel for the court. Commander Davis was then excused to perform duties outside the courtroom.

Lieutenant Commander Stanley Hecker, U.S. Navy, was called as a witness for the court, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry and examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, service and present duty station.
A. Stanley Hecker, Lieutenant Commander, U. S. Navy, Commanding Officer, U.S.S. SKYLARK (ASR 20).

Q. How do you spell Hecker?
A. H-E-C-K-E-R.

Q. How long have you been Commanding Officer of SKYLARK?
A. Since the 8th of January, 1963, sir.

Q. Give us a very brief description of the type of ship that the SKYLARK is?
A. SKYLARK is a submarine rescue vessel that has been converted from a fleet tug ATS type hull.

Q. Directing your attention to sometime immediately preceding the 8th of April 1963, can you tell us what arrangements had been made for you to conduct operations in company with THRESHER?
A. The ship was participating in an ORI.

Q. Permit me to interrupt. Do not use abbreviations that are not widely known to people outside the naval service.
A. Yes, sir. U.S.S. SKYLARK was participating in an Operational Readiness Inspection which terminated the evening, Friday, 6 April. On Saturday morning I returned to the ship to determine if the work requests for the forthcoming upkeep period had been screened by our squadron and the Submarine Base in New London who were to perform the work. At that time I was informed that we were to operate with U.S.S. THRESHER the following week while she was conducting diving trials. I was given a directive to this effect from Commander Submarine Flotilla TWO in a change to his weekly employement schedule No. 14-63. I have the date time group of the message here, Captain.

Q. Is that unclassified?
A. It is unclassified, yes, sir.

Q. Identify this message, please.
A. This is Commander Submarine Flotilla TWO Message 051940Z.

Q. Is this the message to which you refer?
A. Yes, sir.

Commander Submarine Flotilla TWO Message 051940Z was offered in evidence. There being no objection it was received in evidence.

REPORTER: This will be Exhibit 32.

Q. Please read Exhibit 32.

(The witness read Exhibit 32.)

Q. And do you have a copy of the Operating Schedule under which the operation was conducted?
A. Yes, sir, I have the basic Weekly Operating Schedule for Commander Submarine Flotilla TWO 14-63; it is unclassified.

The Weekly Operation Schedule for Commander Submarine Flotilla TWO, 14-63 was offered to the court in evidence. There being no objection it was so received.

REPORTER: This will be Exhibit 33.

Q. Please read pertinent excerpts relating only to the incident under inquiry.
A. Aye aye, sir. Commander Submarine Flotilla TWO 14-63. From: Commander Submarine Flotilla TWO, To: Distribtuion List. Subject: Detailed schedule of Employment for Ships in Submarine Flotilla TWO areas 8-14 April 1963. Reference (a) Commander Submarine Force, Atlantic Fleet Operation Order 1-61, change 2. (b) Commander Submarine Flotilla TWO Operation Order 1-62, change 2; (c) Commander Submarine Flotilla TWO Instruction 3140.2; (d) Commander Submarine Flotilla TWO Instruction 3120.1D. Enclosure (1) Subject Schedule. Paragraph 1. Enclosure (1) effective 0000R, 8 April 1963 furnishes information as to area assignments, employment, rendezvous, communications and details of services provided units operating and assigned Commander Submarine Flotilla TWO. Paragraph 2. This schedule is approved and issued in compliance with reference (a) for ships operating in the New London area and it shall be executed accordingly, weather and circumstances permitting. Attention is directed to references (a), (b) and (c). Particular attention is drawn to reference (d), which sets forth an explanation of operating schedule symbols and abbreviations. Paragraph 3. Area assignments commence 0000R and terminate 2400R on the effective day unless otherwise directed. Paragraph 4. This Operating Schedule will have served its purpose and will be cancelled at 2400R, 14 April 1963. Signed R. R. McDonald by direction. Distribution is in accordance with enclosure (3) to reference (b), enclosure (1) to Submarine Flotilla TWO Operation Order 14-63, page 3. Ships in upkeep, New London, State Pier, U.S.S. TUSK (SS426), U.S.S. SKYLARK (ASR 20).

Q. Now did SKYLARK have any discussions with THRESHER with regard to the operation?

A. Yes, sir, Saturday morning upon receipt of the change I directed my Operations Officer, LTJG (b) (6) , to call THRESHER by phone to see if they had any information that we would need relative to the operation. Lieutenant (b) (6) called THRESHER and spoke to the Operations Officer; he did not record the name of this officer, and was told that THRESHER would be conducting surface trials the morning of 9 April and expected to conduct shallow diving trials at a ratio of about one every two and a half hours that morning, after we had rendezvoused. He further stated that upon completion of the shallow dive trials he would release SKYLARK to proceed to the deep dive area and rendezvous the following morning at the area and that we probably wouldn't see him the rest of the night after being released because he was very likely to be running submerged. He also stated that the other dives would be of a duration of about twelve hours.

Q. Were there any further communications between SKYLARK and THRESHER before you got underway?

A. Yes, sir, the Operations Officer of THRESHER called back and spoke to Lieutenant (b) (6) , who was the Operations Officer in SKYLARK and the Duty Officer also that day, and informed him not to make any reference to depth of THRESHER in any transmission in view of the fact that it was classified.

Q. Was there any further communication between the two ships?

A. No, sir.

Q. Thereafter you got underway in accordance with your orders, did you not?

A. Yes, sir.

Q. When was that and what did SKYLARK do thereafter?

A. I have my Quartermaster's Notebook here, Captain, and I would like to read the entries at the time we got underway, and times of rendezvous.

Q. This is the official Quartermaster's Notebook of your ship SKYLARK?

A. Yes, sir.

The official Quartermaster's Notebook of the SKYLARK was offered in evidence. There being no objection it was received in evidence.

REPORTER: This will be Exhibit 34.

Q. Refer to Exhibit 34 and read extracts therefrom relating to these operations.

A. I refer to Exhibit 34, an entry on Monday, 8 April 1963, "At 2120" that's local time, "stationed a special sea and anchor detail making all preparations to get underway".

Q. Attempt to abridge your reading until you get to the portions--

A. "At 2205 the ship was underway in accordance with Commander Submarine Flotilla TWO Message". "051940Z" The ship then proceeded in accordance with our movement report via the Cape Cod Canal to the initial rendezvous in the Boston operating area 1B. Rendezvoused the morning of 9 April. On 9 April 1963 at 0949 the entry states "All ahead one-third. Made rendezvous with U.S.S. THRESHER (SSN-593)".

Q. After rendezvousing with THRESHER, what were your operations thereafter?

A. THRESHER conducted surface trials, maneuvering on the surface. Initially we had taken station four thousand yards on THRESHER's port beam. I have this position here.

Q. What was the position of that rendezvous?

A. At latitude 42°-56' North, longitude 70°26' West, and we maneuvered on various courses and speeds until 1134.

Q. Are all your times local times, unless you signify otherwise?

A. Yes, sir.

Q. Continue.

A. At the time we noted a water discoloration between the two sterns of the two ships. THRESHER was approximately three thousand yards on my port quarter.

Q. Was she on the surface?

A. On the surface.

Q. Did you notice anything unusual about her at all at that time?

A. No, sir. We informed THRESHER of the discoloration. I think the entry is in the UQC Log, sir. Most of the communications by this time were by UQC, and THRESHER told us to investigate. SKYLARK proceeded to investigate and at 1138 SKYLARK was alongside the discoloration, which appeared to be approximately twenty-five feet in diameter, two feet below the surface. It appeared to me as a muddy bottom disturbance.

Q. Can you describe it any more clearly?

A. It was a grayish tan in color, through the surface waters. We informed THRESHER of the findings and received nothing in the way of concern in return.

Q. Thereafter describe the operations that ensued?

A. SKYLARK continued maneuvering at various courses and speeds while THRESHER continued her surface trials. At 1246 THRESHER submerged for a shallow dive.

Q. Have you plotted the position of that dive on a chart?

A. Yes, sir.

Q. Produce it. Have you a track chart as well?

A. Yes, sir.

Coast and Geodetic Chart No. 71 and a tracking chart prepared by the witness were offered in evidence. There being no objection they were so received.

REPORTER: Coast and Geodetic Chart No. 71 and the tracking chart will be Exhibits (35)and (36), respectively.

Q. Identify these charts for us, please.

A. Coast and Geodetic Chart No. 71, and the overlay is a dead reckoning tracer plot conducted by CIC personnel in SKYLARK.

Q. Refer to the exhibits as you deem it pertinent during your testimony as to the operations of the vessel.

A. Exhibit 35 indicates the position of rendezvous and the position of commencement of THRESHER's shallow dive. Exhibit 36 indicates the entire track of THRESHER's shallow dives, as she had kept her mast exposed to provide a radar contact throughout the shallow dives. The commencement time is 1245. Termination time was 1408.

Q. Have you personally charted these operations on the chart?
A. Yes, sir.

Q. Will you state your naval background and experience with particular reference to your competence in these matters?

A. Sir, I am a graduate of the New York State Maritime College at Fort Schuyler, New York, where I was awarded a degree in Marine Science, a Naval Reserve Ensign's commission and a third assistant engineers license in the Merchant Marine. In 1950 I came on active duty in the Navy and have served in submarines, or within the Submarine Force, except for periods of shore duty, since then. I have served as head of all departments, including navigator, of U.S.S.SKYLARK, U.S.S.TENCH, and U.S.S.PERCH. I have attended the General Line School at Monterey, California.

Q. Very well, please describe this document.
A. In the reconstruction of the tracks I utilized the position plotting sheet BW67.

The court directed that the chart under discussion be pinned on a board so that the witness' testimony in relation thereto would be clear to all present. This was done, and the witness stood in front of the chart during the next portion of his testimony.

The chart on which the witness had plotted the operations was offered in evidence. There being no objections, it was so received.

REPORTER: This will be Exhibit 37.

The witness continued his testimony.

A. The initial shallow dive was conducted between Boon Island and White Island and upon our release we proceeded in a southeasterly direction to clear an obstruction area, an explosive dumping area, and then proceeded out to the rendezvous point where we arrived at approximately 0545; the exact time I have in my log. I have the ship's radio log relative to communications with THRESHER at that time.

Q. Produce it. Is this a portion of the official Radio Log of the SKYLARK?
A. Yes, sir.

Q. Is it unclassified?
A. Yes, sir.

The Radio Log of the U.S.S. SKYLARK was offered in evidence. There being no objections it was so received.

REPORTER: This will be Exhibit 38.

Q. Refer to Exhibit 38 as necessary to describe the ship's operations.

A. Aye, aye, sir. These times will be ZULU as they are recorded in here.

Q. This will be Greenwich?
A. Greenwich mean time. 1119Z message "THRESHER, this is SKYLARK present posit 64-58 West, 41-44 North. Believe we hold you 121 degrees 4500 yards".

Q. For the purpose of making this more understandable, could you explain the difference between Greenwich time and local time?
A. The Greenwich meridian is the reference meridian from which time is measured East and West. It runs through Greenwich, England; it's the zero meridian. We are at this time not quite sixty-five degrees from Greenwich. Each time zone is roughly fifteen degrees from Greenwich.

Q. So these times translated into local time would have how much difference:
A. Five hours, sir.

Q. Five hours earlier?
A. Yes, sir.

Q. Thank you, proceed.
A. The next message was from SKYLARK to THRESHER: "Understand, 121 degrees forty thousand yards". The next message was at 1123Z. This was from SKYLARK "This is THRESHER. Do not believe that contact at 121 degrees forty thousand yards is us. I'm at periscope depth. My navigational posit ten miles from you." "THRESHER, this is SKYLARK. ROGER contact 121 degrees forty thousand yards believe to be weather". The next message on here is 1121Z "SKYLARK this is THRESHER. Interrogatory speed". "THRESHER this is SKYLARK. Speed five knots". "SKYLARK this is THRESHER. Request you increase speed to ten knots and circle on station to provide noise source for my sonar". "THRESHER this is SKYLARK. My speed ten knots, circling on station". 1135Z "SKYLARK this is THRESHER. I hold you visually bearing 140 approximately seven miles from me. Am closing to establish GERTRUDE communications". At 1140Z "THRESHER this is SKYLARK. ROGER OUT". "SKYLARK this is THRESHER what is your present turn count". "THRESHER this is SKYLARK turn count 80RPM". The next message was at 1201Z "SKYLARK this is THRESHER, request you lie to". "SKYLARK ROGER subject message lie to." There are transmissions from this point on in the UQC Log indicating a closer position of THRESHER. Indicating an additional position of thirty-four hundred yards.

Q. I show you Exhibit 16; is this the Underwater Telephone Log of the UPC Log to which you refer?
A. Yes, sir.

Q. Refer to it if necessary, bearing in mind not to develop any information of a classified nature.
A. Yes, sir, we are now back to local time. This log is maintained on local time. On 10 April "THRESHER this is SKYLARK radio check" "SKYLARK this is THRESHER over" and so on until 0745.

PRES: The court would like to request that the witness take into consideration the volume of testimony that we will have to take and read, and try to avoid putting into the record testimony which could not have any significant bearing on the matter under investigation,

such as radio checks at the early stage, where there are thousand of radio checks that don't mean a thing to us at this time. The last radio check would mean something; the last underwater sound check, but at this point they are rather incidental.

The witness continued his testimony.

A. At 0745 "THRESHER this is SKYLARK. Hold you 147 at 3400 yards."

By a member, RADM Daspit:

Q. This is transmission from the SKYLARK to the THRESHER?
A. No, sir, I too was confused in my transmission. The "From" column is THRESHER, the "To" column is SKYLARK.

Q. So the THRESHER holds SKYLARK 147 at 3400 yards?
A. Yes, sir. At ~~0447~~ 0747 from THRESHER to SKYLARK "Starting deep dive".

By counsel:

Q. Perhaps I can abridge this by asking, have you carefully studied the transmissions that are recorded here?
A. Yes, sir.

Q. For the periods from the times you are now reading to the times covering the rest of the operations that date?
A. Yes, sir.

Q. Are they substantially true and correct and complete?
A. Yes, sir. In some cases where the watch has changed the call signs were exchanged in the number two column. This was due to the fact that a radioman was recording and had been accustomed to maintain radio logs.

Q. You have indicated one way in which the entries are not fully accurate, complete or correct. Are there other entries which, to your knowledge, require explanation?
A. Yes, sir.

Q. Indicate them.
A. There is an entry of 0912 listed as from SKYLARK to THRESHER. My recollection is that it was from THRESHER to SKYLARK and it stated "Have positive up angle, attempting to blow". My recollection at that time was "Have positive angle, experiencing minor difficulties" or minor problems; I'm not sure of the exact word; "attempting to blow".

By the President:

Q. Just a minute. This is pertinent testimony. Let's get this word for word, accurately as you remember it. Now how far were you from the speaker at this time?
A. Seven feet I would estimate, sir.

Q. You heard it fairly well?
A. Yes, sir.

Q. Say again what you thought it said at the particular time.
A. The statement started with "Experiencing minor problem", there was a pause.

Q. Are you sure that he said minor and not major?
A. Yes, sir.

Q. O.K., go ahead.
A. "Have positive angle" I did not hear the "up" I heard "positive angle" another pause and then"Attempting to blow". The voice was very relaxed and to me appeared not overly concerned, as if it were a normal experience.

By the counsel:

Q. We want to get a clear picture of the circumstances under which you heard this message. Who was on the bridge at the time and within hearing range?
A. Lieutenant Watson was at the plotting table immediately below the Underwater Telephone. Mowen was at the phone; he was the UQC operator. (b) (6) was recording in the log. In addition in the pilot house at that time we had the Officer of the deck, LTJG (b) (6) who was forward of the binnacle; the Junior Officer of the Deck, Hospital Corpsman Chief (b) (6) , Boatswain's Mate of the Watch (b) (6) , helmsman named (b) (6), seaman apprentice, and a messenger. I have the messenger's name in my bag, in addition to myself.

Q. Will you refer to your records to refresh your recollection of the messenger?
A. (b) (6) was the messenger, and the Quartermaster of the Watch was (b) (6) quartermaster second class.

Q. Was each of the persons whom you have enumerated in a position to hear the transmissions?
A. Yes, sir.

Q. Both outbound and inbound?
A. Yes, sir; they were all within the pilot house which is approximately fifteen feet wide and ten feet long with a curved front section.

Q. Where was THRESHER at this time with relation to SKYLARK?
A. I don't know, sir.

Q. What is your best estimate of the relative positions of the two ships?
A. I felt that she was fairly close, considering the various course changes which we had received in the UQC Log and the fact that she was attempting to maintain a position in my vicinity while conducting the deep dive trials.

Q. What was the state of the wind and the sea at that time and the weather?
A. I have my weather logs for that period here, sir. To my recollection it was fairly calm, clear, slight wind.

The Weather Log from the U.S.S.SKYLARK was offered in evidence, and there being no objection it was so received as the official weather log of the U.S.S. SKYLARK.

REPORTER: The U.S.S. SKYLARK Weather Log will be Exhibit 39.

Q. Read the entries which relate to the period in question.
A. The entries for 10 April 1963, at 0900, the wind direction 015, speed seven, visibility ten miles, weather overcast, barometer was at 29.27, dry bulb temperature was 42, wet bulb temperature was 39, sea direction 010, height one. At 1000 wind direction was 355,speed five, visibility ten, overcast, barometer 29.27, dry bulb 45 degrees, wet bulb 42 degrees temperature, sea 000, height one.

Q. Height one means waves one foot in height?
A. This is the Beaufort Scale.

Q. Describe the height of the waves at the times you have indicated.
A. The sea was smooth, fairly calm, although the ship itself does roll even in calm seas.

Q. Could the roll of the ship have in any way disturbed the man who was making the entries into the UQC Log during the period commencing a little before eight o'clock and running thereafter until these?
A. Possibly, sir, but I would say probably no.

Q. Is it possible that he might have lost his balance at any time so that he could have missed logging a part of the transmission?
A. Possibly, sir.

Q. But there was nothing in the weather to interfere with the operations which were going on aboard your ship at that time?
A. No, sir.

Q. Not to make it difficult to hear the transmissions emanating from THRESHER?
A. No, sir, communications were clear.

Q. Proceeding then, are there any other entries in the UQC Log which to your knowledge do not square with your recollection of the event?
A. At 0914 SKYLARK informed THRESHER that there were no contacts in the area. This was on my order, considering that he might possibly have blown up and come right to the surface.

Q. When you say "blown up" what do you mean?
A. He stated "attempting to blow"; I thought at that time he was possibly becoming slightly heavy in the vicinity of his test depth and wanted to hold himself at his test depth, on the positive side of the test depth.

Q. Precisely. Now to blow means what in the operation of a submarine?
A. To open a high pressure air valve and to permit air from the air banks to flow into the ballast tanks, or a ballast tank, to place an air bubble, displace the water with an air bubble, and give the ship some additional buoyancy, positive buoyancy.

Q. After receiving the message that he was attempting to blow up did you hear anything over the UQC other than those words?
A. At that time, no, sir. There was a lapse of a few moments where I informed him that there were no contacts in the area. I gave him my course and asked for his range and bearing from me, because I did not hold him on my sonar, and then I asked him if he were in control. I directed the operator to send this message to him to see if he had regained control and the operator did not understand me. I then took the microphone and asked him "Are you in control?"

Q. Were you in anyway concerned at that moment?
A. Only from the standpoint that he would come up underneath me. I was concerned for my ship, yes, sir.

Q. But not for any alarming conditions in the submarine?
A. No, sir.

Q. Proceed.
A. I had one engine at propulsion at that time and directed my officer of the deck to place four engines on propulsion to prepare to clear the area.

Q. Then what did you hear?
A. Shortly after that there was nothing to speak of. At approximately 0917 I heard what sounded to me like tanks being blown.

Q. Explain how you arrived at that conclusion; what you heard?
A. I've heard tanks blown many times before from the inside of a submarine and also from SKYLARK. It was the rush of air, the muffled rush of air, I might say.

Q. There is no question in your mind but that you heard tanks being blown?
A. I have no question but that I heard air being blown.

Q. Please be very careful in your assessment and reply to the next question, so that you can make it as accurate as you can within your own recollection. Now, for how long a period did you hear the sound of air being blown?
A. I would estimate about twenty seconds or longer.

Q. How much longer?
A. Twenty to thirty seconds. It was a fairly long blow.

Q. Bearing in mind your knowledge and experience in this field, does it seem like a normal emission to you; it wasn't erratic?
A. The air rush was normal; there was a garbled transmission at that time.

Q. But with respect to the sound of the air rushing, it was normal?
A. There was some background noise behind all this. It may have been something falling in the vicinity of the underwater telephone, the microphone being dropped, or something of that nature.

Q. Now tell us about the transmission that you referred to, the garbled transmission.
A. There was a voice transmission over the UQC at the time of this air sound, which was unintelligible to me.

Q. Can you describe it as to the duration or the intensity whether the voice had a tone to it which was agitated or otherwise. How can you best describe it to the court?
A. I could not describe it, sir, it was that unclear.

Q. How long did it last?
A. Not as long as the air blow.

Q. Was it a garbled voice which you heard?
A. I felt that it was a voice, yes, sir.

Q. Could you hazard any opinion as to the number of words which were included in the transmission?
A. No, sir, it was so effectively blocked by the air; it sounded as if they were trying to come through the air.

Q. Did you interpret it as being blocked by the sound of the air, rather than because of any difficulty in the source of transmission?
A. No, sir, at that time I didn't evaluate it at all; it was a voice transmission while he was blowing.

Q. As you recollect it now, do you think it was the background sound of the air rather than any other difficulties which caused you to receive it in a garbled condition?

A. Right now, sir, upon thinking of this, it sounded as if the transmission was trying to come through the air as if there was a bubble. I'm getting into the realm of the classified now.

Q. Proceed then with the next item. What happened thereafter?

A. I attempted to recommunicate with the THRESHER once this noise had ceased, the air noise, and was unsuccessful. SKYLARK then commenced trying to reestablish communications. I thought possibly it may have been communications failure or a flooded transducer, which does occur occasionally on deep dives.

Q. Was it alarming to you in any way, although abnormal? Routine enough so that your reaction was one of concern or unconcern?

A. I was concerned that I had no communication, yes, sir, and was attempting to reestablish communications; vigorous attempts to reestablish communications, with both sonar, UQC and ~~QHD~~ QHB sonar. These are the only two sonars installed in SKYLARK.

Q. Could the starting of your additional engines in SKYLARK have interfered with communications?

A. The engines are amidships and the Underwater Telephone transducer is forward.

Q. Then your reply to my question is what?

A. No, sir.

At this point the reporter, (b) (6) was relieved by (b) (6)

Direct Examination continued:

Q. (By counsel for the court) Continue with your relation of the events which occurred next.

A. Then I attempted to determine just where he may have been, correlating all the information I had available there at that time, and I guess I had no realization of how fast time was passing, because at 1040 I commenced explosive signals. This was over an hour after having lost sonar contact. Also at that time I directed my Operations Officer to prepare a message to Submarine Flotilla TWO to tell them that I had lost communication with THRESHER, and it was almost a half hour before the message was released.

Q. What were the orders of the officer in tactical command in THRESHER which pertained to the operation of the SKYLARK and which commenced during deep dives, such as your communication with him?

A. He directed me to remain in the vicinity, and that was all. Then I came up and asked him if he would conduct a UQC check at fifteen minute intervals. This was so that we could see if he was all right during the progress of the dive.

Q. This was all previous to the dive, of course?

A. Yes, sir.

Q. All right, go on with your account of the incident.

A. I have some notes here, and I beg the Admiral's permission to refer to them.

PRESIDENT: You may refresh your memory, Captain.

THE WITNESS: Some points for the record: SKYLARK had a normal underway watch set for escorting submarines, and we had augmented the watch with a telephone watch. The SONAR in SKYLARK, our UQC, and QHB, with maximum range of 3,750 yards under ideal conditions. Since I have had command of the ship, I have noted ranges in the vicinity of 2400 yards. One point relative to the dive: From 0747 ROMEO, when we received the message that THRESHER was commencing the deep dive, until the first transmission saying he was proceeding to test depth at 0835, was a total elapsed time of 48 minutes. This appeared rather rapid, and indicated to me that things must have been progressing very well.

Q. You have told us of voice transmissions which you have heard and sound which you identified as the blowing of air in tanks.

A. Yes.

Q. Did you hear any other background noises at any time in this crucial period?

A. I cannot be sure that I heard anything else, Captain. I did hear the voices. There may have been -- I cannot say yes. There may have been some other background noises interspersed.

Q. Did you have occasion to discuss the background noises later with your navigator?

A. Yes, sir. That afternoon, Lieutenant Watson asked if I thought I had possibly heard breaking-up sounds. I had never heard breaking-up sounds before. Lieutenant Watson has served in submarines for many years and during World War II he had heard ships breaking up. I did not. I told him possibly it may have been, but I could not say, sir.

Q. Commencing with your dropping of underwater explosive signals, describe your operations at that time.

A. I commenced at approximately 0921 -- I have a track chart, which is an overlay to this, Captain, of an expanding square search that SKYLARK commenced at 0921 attempting to reestablish communications with THRESHER.

Q. Produce it.

A. Here it is. (The witness produced said Track Chart.)

Q. From your knowledge of the operations, is this substantially true and correct?

A. Yes, sir. And I had two operators sign the sheet.

COUNSEL: I offer this in evidence.

The said track chart was submitted to the court and was offered in evidence. There being no objection, it was received in evidence and marked "Exhibit 40."

Q. (By counsel for the court) All right, continue, please.

A. This search commenced right in the center at 21 and progressed on up until we got on to the plan. These variations were where we thought we may have heard something, and we worked our way back into the plan and all around the area indicated here (indicating on chart). We picked up a radar contact, and it looked like a submarine sail. We were rather anxious at that time and we were wishing that it was a sail. We ran out and discovered that it was a PC type hull. He did not answer our challenge. It was not a naval vessel, sir. We then ran back and continued on our expanding square search.

Q. You stated that you heard possible sounds?

A. High noise levels on the UQC.

Q. But nothing you were able to identify?

A. No, sir. It may possibly have been fish noises. There were black fish in the area.

Q. Did weather conditions in any way interfere with your search?

A. No, sir, not the first day.

Q. Conditions were good?

A. Yes, sir.

Q. Very well, will you continue? Do you have a track chart for the period 0745 to about 0920, local time, that morning?

A. No, sir. We were circling within a mile of the initial position.

Q. And is that so indicated on an exhibit?

A. Yes, sir, on this exhibit here (referring to Exhibit 35). It has the times and the various phases at that position.

Q. Please continue.

A. We continued our search until 1712 that afternoon. We made radar contact and visual contact with the U.S.S. RECOVERY, ARS-43. At 1727 RECOVERY stated he had sighted an oil slick. SKYLARK then proceeded to the position of RECOVERY to confirm. It was in fact an oil slick. We took samples. RECOVERY had a boat in the water. From the bridge I could not see debris, but other people on the ship were in a position to see debris. Certain small bits of cork were recovered by my crew. RECOVERY's crew recovered bits of cork and what appears to be styrofoam, a small piece of

soft yellow plastic similar to that found in a child's toy, and a tube of what appeared to be cake icing, or some other type of food preparation.

Q. I show you these exhibits, and ask you whether these are the items to which you are referring?
A. Yes, sir.

Q. This first item, Exhibit 26, is a small piece of yellow plastic?
A. Yes, sir. And Exhibit 25 is the styrofoam and some cork, and the tube is Exhibit 29. Those items were recovered that night of the 10th of April. In addition, we utilized our Polaroid camera and attempted to take photographs, two of which were delivered to the board by Lieutenant Watson.

Q. Do you identify those photographs as Exhibits 17 and 18?
A. Yes, sir.

Q. In connection with Exhibit 18, will you describe the oil slick which you saw at that time?
A. The oil slick was approximately 1,000 yards in diameter, and it was a very definite covering of oil, bluish in color, and it was an unbroken film, and it covered the entire area.

Q. For how long a period did you observe the oil slick?
A. We stayed within the area of the oil slick until that evening.

Q. For an extended period of time?
A. Yes, sir, for about an hour or two, long enough for RECOVERY's boat to pick up more debris and continue her search. It was after dark when we finally departed.

Q. During the time you observed that oil slick, did it appear to be growing in size?
A. No, sir. It remained about the same size and consistency.

Q. What is the very best information which you hold on bearing and distance of that oil slick sighted by RECOVERY from the one-mile circle in which the SKYLARK was operating during that period?
A. I have that in that chart, sir.

Q. Please show us.
A. (The witness referred to Exhibit 37.) At 0912 we have this position of latitude and longitude which I have in my records, and at 1800 we were in the oil slick in a south easterly direction from the position in which we were circling.

Q. Very well.
A. A distance of about seven miles.

Q. Will you then refer to your records and give us the latitude and longitude of those points, please?
A. (The witness examined some papers in his possession.) I have here my Ship's LORAN Log.

Q. Would you produce that log?
A. Yes, sir.

COUNSEL: I offer it to the court for the purpose of introducing into evidence pertinent extracts therefrom.

The said LORAN Log was submitted to the court, and was offered in evidence by counsel for the court for the purpose of reading into the record such extracts therefrom as pertained to the inquiry.

There being no objection it was so received. Extracts therefrom are appended marked "Exhibit 41."

Q. (By counsel for the court) Refer to Exhibit 41 and give the navigational information.
A. On 10 April at 0921 we have a position 41° 45' North and 64° 59' West.

COURT MEMBER, CAPT Osborn: Would you repeat those again? Go a little slower.

THE WITNESS: 41° 45' North, 64° 59' West, by LORAN Stations 1H3 and 1H4. Would the court like the actual LORAN readings for that time?

COURT MEMBER, CAPT Osborn: No.

THE WITNESS: At 0949 the position is essentially the same. At that time we were on the expanding search and the positions start moving out, until at 1800 the position, at which time we were in the oil slick, the same two LORAN stations, latitude 41° 40.8' North, 64° 55' West. We were, by the LORAN Log, in that same position at 1703.

COURT MEMBER, CAPT Osborn: I would like to have a position as close to 0745 as possible.

THE WITNESS: Yes, sir. At 0740, Stations 1H3 and 1H4, latitude 41° 46' North, 65° 03.2' West.

Q. (By counsel for the court) State the nature of the LORAN equipment utilized for these positions and its operating effectiveness at that time.
A. SKYLARK has a DAS-4 LORAN, which had been experiencing difficulties during the night. The statement here by the senior quartermaster states from 0130 to 0540, "These readings not reliable. LORAN adjusted." The first class electronics technician on the ship was called out, and he readjusted the LORAN, and at 0626 a phase was taken. There is no latitude or longitude readings in here, and this was plotted. This is the one that I plotted this morning. By the station signal counts they are fairly close to the 0658 position, and the 0740 position, within five microseconds on Station 4, and within one microsecond on Station 3.

Q. After the adjustment of the equipment, were you confident of its accuracy?
A. Yes, sir.

Q. Can you estimate, from your knowledge of it, within what scope of accuracy these positions are correct?
A. I think within two or three miles, I would estimate.

Q. And give us your views of the experience and competence of the personnel who operated the equipment at those times?
A. Lieutenant Watson, the navigator, is an ex-quartermaster with about twenty years of naval service. He's been commissioned for three years as an LDO, limited duty officer, deck.

Q. And your view of his competence?
A. As a navigator he is very competent.

Q. And as an operator of LORAN?
A. Very competent. In addition, the senior quartermaster, (b) (6)
a first class quartermaster, is a very competent LORAN operator. I might mention that Lieutenant Watson had the 0400-0800 watch that morning. This is normally assigned to the navigator during transits or overnight operations.

Q. Continue with your account of the search operations which followed.
A. After taking the oil samples and receiving the debris from RECOVERY, I positioned RECOVERY in the oil slick, primarily because he had no SONAR equipment, and as a search vessel he had no effectiveness for an underwater search, and commenced a search between the 0921 position and the oil slick north and south by a parallel search plan north and south with legs of 1,000 yards apart, hoping to discover additional debris, considering it may have been set downwind and current.

Q. What equipment was utilized in connection with prosecuting the search?
A. My ~~QHC~~ SHB, SONAR, and listening on the UQC.

Q. And was this equipment in good operating condition?
A. Reliable operating condition.

Q. Reliable. All right.
A. One point here relative to the sonar equipment: The Saturday before we got underway on Monday evening, ship's divers inspected the sonar transducers and reported them in good condition.

Q. Very well. Proceed, then with your account.
A. About that time -- Well, while we were on this north-south parallel search, we received messages stating that the Deputy Commander Submarine Force, Atlantic Fleet, was in BLANDY and proceeding to the scene to assume the position of Commander Task Group 89.7, and that Captain Andrews, Commander Fleet Development Group TWO was in U.S.S. NORFOLK proceeding to the scene, and he would be Commander Task Unit 89.7.2. He was to arrive prior to Admiral Ramage and would assume Senior Officer Search Force responsibility, which I had been assigned at that time. They rendezvoused after I had completed my north-south searches, and I positioned one on either side of me, and we commenced a similar search plan to the south, considering the currents carrying the debris down beyond the oil slick at that time, although RECOVERY was not sure he was within the oil slick at that time, considering the darkness. The weather picked up somewhat that night, and the following day got rather bad. I don't remember the sea states or winds.

Q. Would you please refer to Exhibit 39, please, and give us those?
A. By 0600 the wind velocity was 12 knots by 295. Sea was 290, State 3. At 1400 the wind was from 270, velocity 19. The sea was from 270, State 5, and remained at about State 5 through midnight - State 5 and up to State 6 at midnight.

PRESIDENT: I think that's sufficient.

Q. (By counsel for the court) Do you have in your possession your Navigator's Work Book? If so, produce it.
A. Here it is.

COUNSEL: I submit it to the court for the purpose of introducing it into evidence.

The said Navigator's Work Book was submitted to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence and marked "Exhibit 42."

Q. (By counsel for the court) Refer to Exhibit 42 and produce the records of the evening sights for the evening of April 9, 1963.

A. Yes, sir. 9 April 1963. P. M. star sights. Various bodies were observed, and the position was recorded by Lieutenant Watson as 42° -29.7' North, 68° -44.5' West. This was the last celestial sight until the 11th of April, and this is what I based my previous statements that the LORAN appeared to be correct that morning and I had reliance in it.

COUNSEL: I have no further questions at this time, sir.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Nash:

Q. In reading the instructions you received from COMSUBFLOT TWO, you indicated two phases and two positions. Was either position the position in which the test dive occurred?

A. No, sir.

Q. Did you ever, during the day, have QHB contact?

A. No, sir.

Questions by a court member, CAPT Hushing:

Q. You stated earlier that at approximately 0912 you heard a transmission from THRESHER which you described as approximately "Experiencing minor difficulty. Have positive angle. Attempting to blow up." And you said the voice was relaxed and in a normal tone?

A. Yes, sir.

Q. You also said that the next transmission was approximately 0917, and about that time you heard the tanks being blown?

A. Yes, sir.

Q. This was of five minutes' duration, or approximately that much time?

A. Yes, sir.

Q. Did you hearing nothing during that time - during that five minutes?

A. No, sir. I was talking to them. I had given them my course and asked them for a range and bearing, and then I asked if they were in control. I had heard no other transmission.

Q. Did you hear any sounds other than transmission?

A. No, sir.

Q. So then for five minutes, from 0912 until 0917, you heard no transmissions and no sounds from THRESHER?

A. No sir.

Questions by a court member, CAPT Osborn:

Q. You are positive that the logging with respect to these items is correct and that the 0917 entry refers to the blowing rather than the 0912?
A. Well--

Q. Are you positive of that?
A. No, sir. I would like to verify the log. (The witness was handed Exhibit 16.) At 0912 we received the message, "Experiencing minor difficulty. Positive up angle. Attempting to blow." At 0915 I gave him my course and speed, and at 0917 is when I heard the air. Yes, sir.

Questions by a court member, RADM Daspit:

Q. Commander, you testified earlier that at 0835 you received word from the THRESHER that she was proceeding to test depth.
A. Yes, Admiral.

Q. Would you refer to the log?
A. Yes, Admiral.

Q. Now, the actual entries are at 0835 the THRESHER receipted for your previous message. As to the message pertaining to the test depth there is no time. At 0842 you rogered for the message, "Proceeding to test depth." Is it possible that that entry with no time indicated should be 0842 instead of 0835?
A. Admiral, there are two transmissions there as of these times. By merely scanning them, it would seem there is the receipt for the message and then the next message. However, this appears in large caps, and it would not be in large caps for receipt.

Q. Isn't it probable then that the message "Proceeding to test depth" was at 0842 instead of 0835?
A. It's possible, Admiral. I couldn't say for sure unless the recorder was here - the person who recorded the entry.

Q. Now, let's go down to 0912. There are four entries there under the time 0912.
A. Yes, sir.

Q. But the receipt for the message, "Have positive up angle..." and so forth, is logged at 0914?
A. Yes, sir.

Q. Is it probable then that you received this message at 0914, assuming you receipted for it right away?
A. May I check the Quartermaster's Note Book to see if he has any recordings relative to this?

PRESIDENT: Captain, you would apparently have to rely on what is recorded in those books to answer this question, is that correct?

THE WITNESS: Yes, sir.

PRESIDENT: You wouldn't remember whether it was 0912 or 0914 of your own knowledge?

THE WITNESS: No, sir.

COURT MEMBER, RADM Daspit: But of his own knowledge he might remember whether there was a two minute interval between the Gertrude check and the other stuff.

PRESIDENT: That's why I asked the question. We can refer to these exhibits to elicit this information. Please rely, therefore, on your memory in trying to answer the Admiral's question. What he is trying to deduce is something which we are not able to get from the records, but we might be able to get it from your knowledge of how things came about.

THE WITNESS: Yes, sir. Well, we rogered, or acknowledged, each message upon completion of the message.

Questions by the president:

Q. Of the transmission?
A. Yes, sir, on completion of the transmission we acknowledged. This I am sure of.

Q. How about the other way around. Did THRESHER habitually acknowledge promptly or did they wait a long time until somebody else was contacted?
A. I would say generally throughout our communication with them they acknowledged immediately.

Q. So that a two-minute interval between a request for check and an acknowledgment would be a little bit unusual?
A. Yes, sir.

Q. Captain, you said early in your testimony that there was a contact by radar at some 40,000 yards, and that at first it was believed to have been the THRESHER, is that correct?
A. Yes, sir.

Q. But it turned out that it wasn't the THRESHER?
A. That's correct, sir.

Q. And it was believed to be weather?
A. Yes, sir.

Q. When you have a contact like that and you believe it to be weather, do you continue to track it and try to determine whether or not it actually was weather or whether it was a moving ship?
A. Yes, Admiral. This is how they determined that it was weather.

Q. Was that identification as weather fairly firm, or was it fairly doubtful?
A. The operator was fairly firm on it.

Q. Then at a subsequent time you sighted a PC type hull which would not answer your challenge?
A. Yes, Admiral.

Q. What were the further movements of that PC type hull with respect to your ship?
A. He was moving in the general area. He may have been a fisherman.

Q. Did he seem to be going anywhere, or did he seem to be hanging around?

A. He initially appeared to be lying to when we first picked him up. We picked him up visually at a tremendous range. Visibility was especially good, and with the refractor it looked like he was above the horizon. This is why I got the impression it may have been a submarine sail. We went out at best speed, and his bearing did not change -- Well, the track is on that chart, Admiral.

Q. You could not get any identifying marks off of his hull or anything?
A. No, Admiral. He was dirty colored.

Q. Even a dirty fishing boat has identifying marks on it?
A. They usually have a name on them. He may have, but it was not visible.

Q. How close did you approach this contact?
A. About 6,000 yards, I would say.

Q. Did you observe his movements any further after your attempt to get him to reply to your challenge?
A. After his not replying to our challenge?

Q. Yes.
A. He paid no attention to us.

Q. Yes, but did you observe his movements after this? Did he stay around or did he hightail it over the horizon?
A. I don't remember, sir. I would have to check my contact log.

Q. Do you have your contact log with you?
A. No, sir. That is the one thing I do not have.

Q. Now, recalling the part of your testimony which had to do with the discoloration in the water, approximately 25 feet in diameter, had the THRESHER been diving in that vicinity?
A. No, Admiral. She had been on the surface. She had not started her submerged work. I thought it might have been an overboard discharge from his ship or my ship or garbage, or something like that.

Q. But the THRESHER knew of this discoloration in the water and he could not explain it?
A. No, Admiral.

Q. Did you at any time detect any other target in this vicinity either by sonar or by visual sighting or by radar, other than the THRESHER, prior to losing contact with the THRESHER?
A. I had no contact reported to me. Now, my night orders, Admiral, state 20,000 yards as the tracking range, and if contact closed within 5,000 yards, I am to be called to the bridge and we are to maintain outside of 5,000 yards.

Q. What is the tracking range?
A. 20,000 yards.

Q. Ten miles?
A. Yes, sir.

Q. Captain, you have testified that you heard nothing between the time that the THRESHER indicated that she was experiencing a minor problem at 0912, and at the time that you got the garbled message at 0917?
A. Yes, sir.

Q. Had you heard anything prior to 0912 which caused you to think that anything was abnormal in the THRESHER's operation?
A. No, Admiral.

Q. In other words, you didn't have any hunch that she was lost when you heard that garbled message at 0917?
A. No, sir.

Q. You thought everything was going along as normal and he was just blowing his air to free his tanks of ballast because of the minor problem he had experienced five minutes earlier?
A. Yes, Admiral. I felt it may have taken him that long to settle his angle down and take a small bubble in his tank, or a large bubble in his tank.

Q. Did you see or have reported to you or hear anyone say they saw and did not report a disturbance in the water such as is caused by the blowing of ballast tanks?
A. No, sir. And we had lookouts alerted for this.

Q. And you did not see any such disturbance?
A. No, sir.

Questions by a court member, RADM Daspit:

Q. During the period of the blow, could you indicate what time relative to that the garbled message occurred?
A. No, sir, I cannot estimate.

Q. This was during the blow?
A. Yes, Admiral.

Q. On your chart you indicated a search which, for a period of time, went up to the northwest. I do not recall whether you indicated why you went up to the northwest?
A. This is only a reset of the bug, sir.

PRESIDENT: The "bug" being the instrument that holds the pencil that makes the mark on the chart.

Questions by a court member, CAPT Osborn:

Q. Do you have -- What speed did the THRESHER dive at on her initial shallow dive?
A. I don't know, sir, but we can figure it out from the track chart here. It wasn't very fast.

Q. Did you have any indications of THRESHER's speed on her deep dive?
A. No, sir.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

WITNESS: Thank you, sir. SKYLARK had no agenda, for one, for the events that were to occur on the 9th and 10th. All we had was an approximate time by 'phone to my Operations Officer. I did not then, and still have no idea of the capability of the ship relative to depth, speed or compatibility of the sonar equipment with my sonar. The UQC throughout this exercise was the only equipment I could place some reliance on, knowing that all submarines have a compatible equipment to the UQC. My ship held the booklet of general plans and the salvage arrangement plan of THRESHER, with no depths indicated. That's all I have to say, Admiral.

REEXAMINATION BY THE COURT

Questions by the president:

Q. In this connection, Captain, what are the capabilities of SKYLARK for assisting a submarine out of control...

A. None, sir.

Q. ...if that submarine is in 8400 feet of water?

A. None, sir. Admiral, I could not even plant a buoy. I have 7200 feet of 7-inch nylon line that I could have used, and it wouldn't have helped. I was willing to put my four anchors or six anchors down, every inch of line, and mooring buoys and moor myself to it, if necessary, to mark some position.

Neither counsel for the court desired to examine this witness further, and the witness stated that he had nothing further to add.

The witness was duly warned concerning his testimony and withdrew from the courtroom.

PRESIDENT: I think we might take a recess here for lunch. The court will recess at this time for lunch. We intend to attend the memorial services this afternoon, but we shall meet before the services and reconvene at 1300.

The court recessed at 1151 hours, 15 April 1963.

The court opened at 1307 hours, 15 April 1963.

All persons connected with the court who were present when the court adjourned were again present in court.

(b) (6) relieved (b) (6) at this point.

H. N. Larcombe, Jr., Commander, U. S. Navy, was called as a witness for the court, was duly sworn, was advised of his rights under Article 31, Uniform Code of Military Justice, was informed of the subject matter of the inquiry and examined as follows:

COUNSEL: Commander, this is an open session of the court and the public is present. For that reason it is desired that there be no evidence introduced in this public session which would divulge any classified information; therefore, you are directed not to volunteer any classified information in open court, and if the question of any member of the court or counsel would, in your judgment, require for a complete answer that you did divulge classified information, you will so indicate rather than answer any questions.

WITNESS: I understand, sir.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, grade, organization and present duty station?
A. H. N. Larcombe, Jr., Commander, U. S. Navy, Commanding Officer, USS DOGFISH; and, as the senior commanding officer of a ship in commission, additional duty as Commander Submarine Force Atlantic Admin Portsmouth.

Q. Will you please spell your last name?
A. L-A-R-C-O-M-B-E.

Q. Now in your testimony you are requested not to use abbreviations which are not generally understood. Would you again, and without abbreviation, give your duties in connection with your Commander Submarine Force Atlantic Fleet title?
A. Yes, sir. Could I refer to notes and refresh my memory?

Q. Just the title; I think you said Admin?
A. Administration.

Q. Now the full title?
A. Commander Submarine Force Atlantic Administration Portsmouth.

Q. What were your responsibilities and duties as Commander Submarine Force Atlantic Fleet Administration Portsmouth regarding the operations of submarines?
A. If it please the court, I request permission to refer to some notes that I have made to refresh my memory?

PRESIDENT: You may refresh your memory, Commander, and then testify. You may refer to your notes.

A. My responsibilities relative to operations for submarines is specified in a Commander Submarine Force Atlantic Fleet OpOrder, and I have three responsibilities specified in this Operation Order: Exercise operational control of Submarine Force Atlantic units conducting local training, trials, and post-repair operations; secondly, to keep appropriate Submarine Refit and Training Group Commanders, in this case, Commander Submarine Flotilla TWO, advised of all local submarine operations; and, thirdly, I have a responsibility to arrange for escorts for local submarine underway tests and training, in accordance with existing directives. These are all responsibilities that I have in that field.

Q. In connection with those responsibilities, did you take any actions in connection with the sea trials of THRESHER during the early part of April of this year?

A. Yes, sir, but not early in April; it was in the month of March.

Q. That they began?

A. Yes, sir.

Q. Please tell us.

A. On the 21st of March I was informed by the Commanding Officer of the THRESHER that they would conduct sea trials on the 31st of March, a Sunday. Since there is a requirement that permission be gained to get ships under way from their home ports on Sunday, at this time, the 21st of March, I informed Commander Submarine Flotilla TWO that THRESHER would conduct sea trials on the 31st of March, in order that he could commence advance planning to gain permission for the escort to get under way on Sunday. In addition, I wrote a letter from Commander Submarine Force Atlantic Admin Portsmouth to Commanding Officer, Naval Base, Boston, requesting assignment of operation areas under the control of Commander, Naval Base, Boston.

Q. Would you explain the command relationship which exists which required you to communicate with Commander Submarine Flotilla TWO for such permission?

A. Yes, sir. I have a responsibility to provide escorts for sea trials if those escorts are under my operational control, or to acquire an escort from the local Base, none of which were available; and my instructions are in this case I will refer to Commander Submarine Flotilla TWO in this area for assistance in acquiring this escort.

Q. What were the results of that initial action on your part?

A. I believe that there is information which affects this planning, sir, which I shouldn't give you before I give the results.

Q. Very well, present it in your own way.

A. On the 22nd of March I wrote a letter to Prospective Commanding Officer, U.S.S. TINOSA, a submarine of very similar characteristics to the THRESHER, and directed him to conduct a salvage inspection of the THRESHER. The Prospective Commanding Officer, TINOSA, directed two officers and a group of enlisted personnel to conduct this inspection, I believe, on the 25th of March -- I believe that is the date, it was a Monday, and I believe the 25th of March. It was reported to me verbally that the salvage inspection could not be completed at this time; that all of the deficiencies, the amount of yard work that was going on on the ship, precluded a satisfactory completion of the salvage inspection.

COUNSEL: May it please the court, I request permission for the reporter to take certain exhibits out of the courtroom.

Such permission was granted.

A. (Cont'd) On the thirty--

PRESIDENT: Feel free to refresh your memory, Commander.

WITNESS: Yes, sir.

A. (Cont'd) I believe it was on the 27th or 28thof March, Commanding Officer, THRESHER, and Captain Heronemus, of the Production Department of this Shipyard, informed me that the THRESHER would not be able to go on sea trials on the 31st of March; that, instead, they would conduct sea trials on the first of March. The Commanding Officer of the THRESHER -- I'm sorry, sir, the first of April. At this time the Commanding Officer of the THRESHER informed me that it was his opinion that sea trials would not be able to be conducted on the first of April either. Had they been conducted on the first of April, an escort would have been required to get under way on Sunday, again requiring permission from Commander in Chief, U. S. Atlantic Fleet. When the Shipyard was asked by me, the Shipyard being Captain Heronemus, and the situation relative to permission from Commander in Chief, Atlantic Fleet, explained to him, he requested that we arrange escort for the second of April. The Commanding Officer of the THRESHER was in doubt as to whether this date could be met, so instead of writing letters and sending dispatches, tentative arrangements were made with Commander Naval Base Boston, Commander Fleet Air Wing THREE in Brunswick, and Commander Submarine Flotilla TWO, arranging areas and escorts for the 2nd of April. On the 31st of March I was informed by the Commanding Officer of THRESHER that a sea trial date of the 2nd would be impossible to meet, and by telephone I reported to Commander Submarine Flotilla TWO, Commander Naval Base Boston, and Commander Fleet Air Wing THREE in Brunswick, to cancel the arrangements that had been made for the 2nd. On either the first or the second, I cannot remember when, the Shipyard requested that I make arrangements for sea trials to be conducted possibly the third, possibly the fourth, possibly the fifth, possibly the sixth. Because of previous cancellations, I merely informed the appropriate people that sea trials might be conducted and requested their cooperation in making assignment of areas and escort on short notice. On the 3rd of April I was informed at the Commanding Officers' Conference, through a statement by Rear Admiral Palmer, that THRESHER would not conduct sea trials until after sound tests and docking.

Q. Would you identify Rear Admiral Palmer for the record, please?

A. Commander, U. S. Naval Shipyard, Portsmouth, New Hampshire. On the 4th of April I was informed by Captain Heronemus and the Commanding Officer of the THRESHER that it was their opinion THRESHER would be able to conduct her sea trials commencing the 9th of April. Again, not desiring to formalize the arrangements, tentative arrangements were made with the appropriate scheduling activities. However, it was indicated that the date of the tenth -- excuse me, the date of the ninth would be probably realized, so in our phone conversations we requested the various activities to formalize the granting of permission to use the areas and to formalize the assignment of an escort. On either the 5th or 6th, and I have a dispatch here that I could give you if that was appropriate, but on either the 5th or the 6th, Boston operating areas that we had requested in our 21 March letter were assigned by Commander Boston Naval Base, and Commander Submarine Flotilla TWO originated a dispatch assigning SKYLARK to be the escort, specifying the rendezvous points and the time of rendezvous, communications, and OTC. This was received by me on Friday night

or Saturday, the 5th or 6th of April, but because of previous cancellations, delays, I did not originate an OpOrder for the under way exercise until Monday at the request of Commanding Officer, THRESHER, a request in which I strongly concurred. On Monday, 8 April, I received from Commanding Officer, THRESHER, a letter reporting that all salvage inspection deficiencies had been corrected, that dock trials and fast cruise had been satisfactorily completed, forwarding the salvage plan and booklet of general plans, and forwarding to me his Next of Kin Book. At this time I promulgated my Operation Order covering THRESHER's sea trials.

Q. In addition to the letter from the Commanding Officer of THRESHER reporting his readiness for sea trials, did you have any personal discussions with him on this point?

A. Yes, sir, I had several discussions with Lieutenant Commander Harvey over the period from my arrival, 4 March, to the time that he got under way. We discussed and agreed that it was his responsibility to insure, above all, that his ship was ready to go to sea, that the work was properly done, that tests were properly conducted, that the crew was properly trained, and that the gear was properly stowed, prior to going on sea trials, regardless of whether he completed at the specified time or not. In the early part of this period he did not feel that he had attained this status. He made statements to this effect on frequent occasions to personnel in the Shipyard and to me. On Monday, the 8th of April, he was completely satisfied that his ship was ready to go to sea.

Q. Did he say that to you?

A. He reported that to me, in addition to the letters which I have previously commented upon. He reported that to me personally in the ward room of the THRESHER, Monday, approximately 1300. I believe that at this time Captain Heronemus was present, there were four or five THRESHER officers also in attendance.

Q. In addition to that bare statement to you orally that he was ready, was there any additional conversation which gave you an impression as to his feeling of readiness?

A. During this whole period he had been informing me of difficulties which precluded his going on sea trials. We had frequent discussions of these. During the whole period he took a very realistic approach to the problem and to his responsibilities; and in most sincere fashion, his statement on Monday, I am sure that he was positive that he was ready to go, sir.

Q. Did you have a detailed list of events which were to be conducted on those sea trials, and did you review it with the Commanding Officer of the THRESHER?

A. I had a detailed list of items which were to be conducted on sea trials. This list did not state the times at which they were to be conducted. It was merely a list showing all of the items that he expected to conduct on sea trials. This list of items that he gave to me and which we discussed was almost verbatim a copy of a Commander Submarine Force Atlantic Fleet Instruction, in the nine thousand series, I don't remember the numbers, which covers dock trials and sea trials. This Instruction specifies those items which must be conducted prior to and on trials, and his list was almost verbatim that instruction on the sea trial requirements.

Q. To what degree are you responsible for pre-sea trial planning of the events to be conducted on the trials?

A. The events in the agenda?

Q. Yes

A. This same Instruction to which I referred stated that the Commanding Officer shall prepare a list of items to be conducted and -- this isn't a quote but -- and will clear it with the Commander of the Naval Shipyard. There is no mention of Commander Submarine Force Atlantic Admin promulgating this or reviewing it officially. Unofficially, I looked at it with him, with the Commanding Officer of the THRESHER.

Q. What was your function and connection with selecting ocean areas for the submerged operation?

A. The Commanding Officer of the THRESHER informed me of his desires relative to his trials. He laid out a track on the chart which covers the Boston Operating Areas off of Portsmouth, and stated that this was the track that he would like to follow on his sea trials. Commander Submarine Force Atlantic Fleet Regulations require that the initial dive after major hull work be conducted in water less than forty fathoms in depth. It was, therefore, necessary that the track be plotted on a chart. This was done. He made his initial dive -- or was scheduled to make his initial dive in thirty-one fathoms of water. The selection of the position that the THRESHER requested was quite satisfactory for the initial dive. The second position selected by the Commanding Officer, THRESHER, the position for rendezvous for the deep dive designated by the Commanding Officer, THRESHER, I questioned him about the use of this position. He informed me that this position was desirable to insure that the pinnacles which were in this vicinity would not cause navigational difficulty to him, would not cause difficulty in case his position were in error, and from past experience it had been impossible to conduct a satisfactory dive in shallower water than that because of the difficulty, in fact, the impossibility of riding the fathometer down because of the irregular contour of the bottom. This was a reasonable condition, a reasonable situation, in my opinion, and I, therefore, approved the posit that he designated for his deep dive rendezvous, and promulgated both posits to the appropriate authority.

Q. Once THRESHER got under way in compliance with her operation order, did you have any control over the actual sea trials themselves?

A. No, sir, I had no control over her sea trials. I did talk to THRESHER after she got under way but I had no control over her sea trials.

Q. What was the nature of your communication with THRESHER after she got under way?

A. I believe at approximately 1600 local time on the 9th I sent a message to the THRESHER on a voice frequency assigned to THRESHER and SKYLARK and asked THRESHER, "Have you completed initial submerged operations?" I could not reach the THRESHER, but the SKYLARK relayed my message to the THRESHER and the THRESHER answered my dispatch by relay through the SKYLARK. The text of her message was, "Initial submerged operations successfully completed. Proceeding with remainder of test agenda."

EXAMINATION BY THE COURT

Questions by a member, Captain Nash:

Q. Captain, what are the requirements for an escort?

A. The Commander Submarine Force Atlantic Fleet Regulations require that after major hull work or for new construction vessels, that an escort with underwater telephones and an active sonar be assigned, a rescue vessel if at all possible.

Q. Have you observed other ships approach the time of sea trials, either new construction or overhaul, PSA, any form of shipyard work like this, have you watched other ships approach the time of sea trials? Maybe my question is not clear. Have you had occasion to be on ships or in the shipyard to observe that period of time just before sea trials?

A. On many occasions, yes, sir.

Q. Is it unusual for there to be delays in the sea trials?

A. I think it is unusual to have delays in sea trials, sir. It is not unusual, in my opinion, for the sea trial date to be met by a great deal of extra effort and additional work by both the ship's force and yard personnel.

Q. Recognizing that this is a rather complicated submarine we are talking about, do you think there is any more reason for a delay in this case?

A. Yes, sir, I think that there would be a reason for delay.

Questions by a member, Captain Osborn:

Q. You said that you had discussed difficulties on the ship, or deficiencies on the ship with the captain of THRESHER; will you name some of them?

A. Yes, sir. He had difficulties -- before I answer the question, sir, I am not really positive of the classification of the equipment that I might talk about. I can put it in general terms that might be acceptable.

PRESIDENT: Any time you're in doubt as to whether or not you are jeopardizing classified information, by all means lean on the safe side and we will ask the court to be cleared and check you on it. But if you can express it in general terms, without getting into classified areas, why then go ahead.

A. He mentioned to me difficulties, sir, in hydraulic valves, in sea valves, in sonar equipment -- and rather than get more specific than that, sir, that is what he discussed and I don't think I can go any further.

Q. These are not specialized particular problems, though; these are the type of problems that you, as the Commanding Officer of DOGFISH, if you were going to sea, are these the type of deficiencies that you would expect to have?

A. Yes, sir, they are the type of deficiencies that I believe quite frequently arise just before any submarine goes to sea, sir.

Q. Did Captin Harvey discuss with you any results of "fast cruise" or training?

A. Yes, sir. I can't remember the dates that these things happened, nor the dates of discussion. He commenced his "fast cruise" on a weekend, or just prior to a weekend, I believe in the vicinity of the 24th or the 25th of March, but I'm not real positive of that date, sir.

Q. Twenty-third - twenty-fourth is a Saturday and Sunday. It was perhaps the 23rd and 24th.

A. I believe so, sir.

Q. You would know whether it was the 23rd or 24th compared to the 30th or 31st or the 6th or 7th?

A. It was not the 30th or 31st.

Q. I think that sufficiently establishes it was the weekend of the 23rd - 24th.

A. He commenced his "fast cruise" at that time and after two and a half days of "fast cruise" he aborted the "fast cruise" because of work that had to be accomplished by the Shipyard on the ship made it impossible for him to have custody of the ship for "fast cruise" without interference from yard work, as required by Commander Submarine Force Regulations; so he aborted his "fast cruise" and resumed it, I believe, Sunday night, the 31st of March, but possibly Saturday night. He was called back from New London by telephone on a weekend and they resumed the "fast cruise" at this time.

Questions by a member, Captain Hushing:

Q. You have mentioned that you have been on board ship during shipyard overhauls and conversions, repairs, and that sort of thing. Have you ever been on a ship being repaired or overhauled in which the shipyard did not work on the ship the day before it went on trials? What I'm trying to get to: Is it common practice to work the day before?

A. Yes, sir, I think so; it is common practice to work the day before to correct deficiencies. It is not, however, common practice for the ship to endeavor to conduct their readiness for sea evolutions at the same time that the shipyard is working on the ship; and for that reason Lieutenant Commander Harvey aborted his "fast cruise" before he completed it. I hope I'm addressing myself to the area that you're interested in, sir.

Questions by the president, VADM Austin:

Q. Commander Larcombe, do you have with you now the letters from the Commanding Officer, THRESHER, in which he stated that all salvage discrepancies had been completed, that his "fast cruise" had been satisfactorily performed, and he was ready in all respects to go to sea?

A. Yes, sir. I have copies of them, Admiral.

Q. But you can attest that they are true copies?

A. Yes, sir. (The witness produced two documents.)

PRESIDENT: We will accept these until such time as we get the originals, at which time we will substitute them for these. I want that one read, the short one.

Two letters from Commanding Officer, USS THRESHER, serial 158 of 8 April 1963 and serial 161 of 5 April 1963, respectively, were received in evidence by the court.

REPORTER: These will be Exhibits 43 and 44, respectively.

PRESIDENT: This second one is rather long and merely says what was done; it's a long list so we won't bother at this time to read this.

Question by counsel for the court:

Q. Please read Exhibit 43?

A. (The witness read Exhibit 43).

Questions by the president, VADM Austin:

Q. Now, Commander, reverting to your discussions with Lieutenant Commander Harvey regarding his difficulties, does any one particular difficulty stand out in your mind from all the others as having bothered him more than the rest of them?

A. No, Admiral. He was concerned because these deficiencies existed which precluded him --

Q. Making his date?
A. Making his sea trials and making various other dates which were also involved.

Q. But from your discussions with Lieutenant Commander Harvey, you formed the opinion, I believe that you have testified, to the effect that he was going to sea, that his deficiencies were made right before he went to sea even if it involved several changes to the sea trial dates?
A. Admiral, I have known Lieutenant Commander Harvey since 1954. He is one of the most competent, well qualified naval officers that I've ever had the pleasure of being associated with. He knew his business. He would not have even considered taking his ship to sea until he was positive in his own mind that he was ready to go to sea, sir.

PRESIDENT: That is what I understood you to have said, but you have now put it in unmistakable language.

Questions by counsel for the court:

Q. Do you have in your possession your classified Operations Order and the Commander Submarine Force Atlantic Fleet Order which pertains to this operation?
A. Yes, sir.

Q. And governing instructions for the Commander Submarine Force Admin Portsmouth?
A. I have a number of them with me, sir; I'm not sure that I have all that you would desire to see.

Q. Please produce your Operations Order and Commander Submarine Force Atlantic Fleet Operation Order 1-61?
A. These items which I have been asked to produce are classified.

Questions by the president, VADM Austin:

Q. What classification?
A. Confidential, sir.

Q. Produce them. They will not be read in court though.
A. This is the original of my Operation Order.

COUNSEL: I present it to the court simply for the purpose of introducing it in evidence.

COMSUBLANT ADMIN PORTSMOUTH OPERATION ORDER 2-63 of 8 April 1963 was offered to the court in evidence. There being no objection it was so received.

REPORTER: This will be Exhibit 45.

CAPT OSBORN: This is a particularly standard OpOrder. I don't think it belongs particularly to the ship. Do we want to take this OpOrder? We can certainly get one made available to us.

PRESIDENT: I would suggest, Counsel, that you ask Commander Submarine Force Atlantic Fleet to provide the court with a copy of this OpOrder rather than deprive the ship of its only copy.

COUNSEL: Aye aye, sir.

CAPT OSBORN: That's the way you feel about it, isn't it?

WITNESS: Yes, sir, and I would also like to get a signature for my Confidential message.

PRESIDENT: All right, we'll give you a chit.

WITNESS: Am I in a position now, sir, to mention those items which I believe are appropriate to this --

PRESIDENT: I was just about to give you that as soon as counsel gets through offering any helpful suggestions in the form of questions he has. Are you completed with yours?

COUNSEL: Yes, sir.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning, further reminding the witness that the court was still open and, therefore, classified material was in the same category as before.

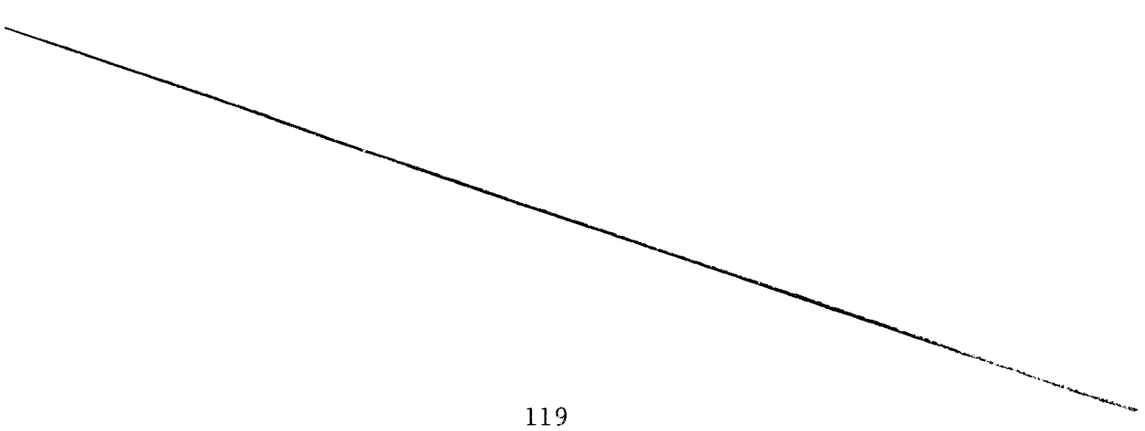
The witness made the following statement:

I do not desire to bring out any information which has not been disclosed by questioning -- any further information -- at this time, sir. However, there has been questioning regarding my responsibility, regarding my actions in this case, which are covered by other publications which counsel has not asked me to produce. If this is the proper time, sir, I will produce them or I will state what they are so you can get copies from other places.

PRESIDENT: I think, Commander, if you will just give counsel a list of those things that you consider pertinent that you have not been asked to produce, we will deliberate and determine whether or not we need them, and that way we may save a little bit of tonnage in our exhibits that we have to tote around with us wherever we go, and they have to be kept, as you know, in a safe, so it gets a little difficult if we take more than we need.

The witness stated that he had nothing further to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.



(b) (6) relieved (b) (6) as reporter at this point.

Commander (b) (6), U. S. Navy, was recalled as a witness for the court, and reminded that his previous oath was still binding. The witness indicated his awareness of his rights under Article 31 of the Uniform Code of Military Justice, as well as the subject matter of the inquiry, and was examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by the counsel for the court:

Q. Please state again for the record your name, rank, organization and present duty station?
A. (b) (6), Commander, U. S. Navy, Chief Staff Officer COMSUBDEVGROUP TWO.

Q. In order that the record of the court of inquiry will be readily intelligible, I must request that you refrain from the use of your customary abbreviations and state fully what is meant by COMSUBDEVGROUP TWO.
A. Commander, Submarine Development Group Two.

Q. And where is the Commander himself today?
A. Commander, Submarine Development Group Two is the on-site commander at the scene of the incident.

Q. Will you state the responsibilities of your command for the planning, review of details, and the control of Shipyard sea trials in the case of the THRESHER?
A. In the case of the sea trials, Commander Submarine Development Group Two was responsible for the accountability of the ship in accordance with this classified publication. (Holds up document)

Q. You may refer to it by name.
A. Commander Submarine Force Atlantic Fleet Operational Order 161, sir, and Commander, Submarine Force Atlantic Fleet Notice 03121 of 13 July 1962,--I repeat the number 03121--which is also confidential. The reports required were made by THRESHER up to the time of the incident, sir. That was our primary duty in this.

Q. Can you tell us what those reports were, made by THRESHER?
A. Yes. They reported passing the point of departure of Portsmouth Harbor at a certain time. Thereafter, she had to come up and say that she would check into the system again. These durations are classified, sir, but she did make the necessary reports.

Q. Do you have those reports with you now?
A. I do not, but they are available here in New Lon--I mean in Portsmouth, sir.

Q. All right. Did you have any discussions yourself, with the commanding officer of THRESHER with respect to his preparing his ship for the sea trials?
A. Yes, sir.

Q. Can you relate the substance of those which you believe to be germane to this inquiry?

A. In the period of approximately 15 March, there were a number of dates scheduled, preparing to get THRESHER to sea, and because of difficulties in the Shipyard, these dates were not made. We felt that it was necessary to discuss with the skipper that we wanted to be sure that he was certain in his mind that all of the items required to be completed, were completed, and we discussed this with him and he assured us this was done, and we are in receipt of a copy of a letter which said that all dockside trials had been completed successfully, sir.

Q. I show you Exhibit 43. Is this the document to which you now refer?
A. Yes, sir.

Q. Commander, I would ask whether you had any personal conversations with the commanding officer of the THRESHER?
A. Yes, I did, sir. The ones I just said were my own personal discussions with Commander Harvey.

Q. And nothing following then receipt of the letter dated April 8th, Exhibit 43?
A. No, sir. April 8th is Monday, sir. I did not talk to him after that.

Q. Can you tell the court about the pre-sea trial planning and review, particularly the sea trials and deep dive evolutions by your command?
A. The agenda was received on Saturday, 6 April, in our office, the regular mail delivery--was taken up on Monday. I read it. I checked with the standards laid down in the applicable COMSUBLANT Instruction which I have here, sir.

Q. Can you refer to it, designate it?
A. Yes, sir. This is an unclassified instruction. COMSUBLANT Instruction 9080.3, sir, of 5 December 1962.

Q. You were satisfied, yourself, that the proposed agenda met the applicable standards, is that correct?
A. Yes, sir.

Q. Did you suggest any additions or deletions from those--the agenda?
A. I did not, sir. This is the primary responsibility, at this stage, of the Shipyard, and I will read for your information if you would like, sir.

Q. Yes.
A. "The ship should consult with the Shipyard in preparing this plan. This plan shall include a firm time schedule for conduct of all tests, responsibility for conduct of each test (Shipyard or Ship), and prerequisites for conduct of each test. Such a test plan will be invaluable to both the Ship and the Shipyard in progressing work and assuring the ship is in fact ready for such major evolutions as dock trials, fast cruise and sea trials," sir.

Q. Was the actual time schedule of events included in the sea trials ever made available to your command?
A. The durations of trials were made available, sir.

COUNSEL: The witness indicates a copy of the THRESHER'S sea trial agenda which is already in evidence.

PRESIDENT: Already in evidence.

(By Counsel)

Q. That agenda mentions the duration of individual exercises, does it not?
A. Yes, sir.

Q. In that sense it tells the time of the exercise; it doesn't actually have a date and time for the exercise?

A. No. That is at the top of the column from under way time from which a best estimate could be made.

Q. Yes, right. Commander, can you tell us the method of operation within your command for keeping track of submarines once they depart on these sea trials?

A. Yes, sir. I refer to this instruction-notice-again, which is a classified document, there is a statement as to what the check report system consists of, sir. I believe that I can say without going too deeply--without going into classified information, that it consists of a message from THRESHER which gives the duration of time that may elapse and there is a maximum for this, sir, before another message would be required to THRESHER--from THRESHER to us, sir. That is one part that is required. Another thing that is required is a status board in our office in which we log these and in which our watch personnel are required to see that we do not exceed those times, sir.

Q. Now with reference to the operations on which THRESHER was engaged on the 10th of April, was such a watch kept for THRESHER?

A. Yes, sir, it was. I would like to bring up one additional thing. There is a split in the responsibility and another command is responsible for it, sir.

Q. Now who was responsible for initiating an alert when a submarine was overdue beyond the parameters of your grace period in your instruction?

A. After she had passed into our area of responsibility, we would have been, sir.

Q. And prior to that?

A. Commander Submarine Flotilla Two, sir.

Q. And in this case who initiated the alert?

A. The alert was actually initiated by SKYLARK, sir.

Q. And it became the responsibility of which command?

A. It became the responsibility initially of Commander, Eastern Sea Frontier as the SAR Commander--Salvage and Rescue Commander--who then after a period, I believe, of approximately six hours, turned this responsibility over to Commander, Submarine Force Atlantic Fleet.

Q. Did you know the Commanding Officer of the THRESHER well, personally?

A. I have known him for a period of about six to seven years, not well up until the time that he reported to THRESHER. Since then we have come in as much contact as you can on weekends and things of this nature, as he would come down and report to us on Friday and Saturday of the progress of the ship overhaul, sir.

Q. Would you say you are familiar then with his frame of mind so that you could evaluate his opinion of the events leading up to the sea trials and his own view as to whether or not he was really ready for them.

A. Yes, sir, I can.

Q. Please tell the court.

A. I think that he was most competent, an astute Naval Officer and he was ready to make the decision, whichever way he believed it should be, as to whether that ship should go to sea or not, sir.

Q. Now, were you anxious to get THRESHER back into operating status?

A. Yes. Everyone was anxious to get her ready, back into operating status.

Q. Can you give us, briefly, the reasons and the significance of that?
A. Yes, sir. THRESHER is the first of a class of ASW submarines which we are building and in which we have THRESHER to evaluate the tactics in order to use this class of submarines.

Q. Now did that anxiety to get her back into operation, in any way cause you to give the commanding officer of the THRESHER the feeling that he should in any way hurry his statement that he was ready for sea?
A. Quite the contrary, sir. I had personally discussed with and told--in a way of speech--that nothing should make him cut any corners on the safety of that ship to meet a schedule, and I am sure he did not, in his own mind, sir.

EXAMINATION BY THE COURT

Questions by a court member, Captain Osborn:

Q. Commander, Submarine Development Group Two was obviously interested in getting THRESHER to sea to evaluate her tactics or capabilities as far as possible.
A. Yes, sir.

Q. During this PSA, was the scope of the PSA with respect to work--things to be accomplished--increased as the PSA went along?
A. Yes, sir.

Q. To what degree--I mean in terms of scope? Was the work doubled or tripled or increased by about 50 percent, or do you have any idea of this, Commander Bellah?
A. From the initial time estimates for completion of the PSA, the time was doubled, sir.

Q. Doubled?
A. Yes, sir. The first estimate for the PSA was four months. She went in in July and she was coming out in April.

Q. Now the scope of the doubling of the time involved was additional work?
A. Some of it, the scope of time was for additional work, yes.

Q. The thing I am trying to say is the same amount of work wasn't spread out over a double period of time; it was additional work that caused it?
A. There was certainly some additional work accomplished during this extended period, sir.

Q. And a lot of the work that I understand was examined to see whether you need to do something, you obviously can't plan, is this correct?
A. Yes, sir.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. To clarify the record, when you say PSA it means?
A. Post shakedown availability, sir.

Neither the counsel for the court, nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith,

which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to say.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Captain William E. Heronemus, U. S. Navy was called as a witness for the court, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry and examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by the counsel for the court.

Q. State your name, rank, organization and present duty, station.
A. I am Captain William E. Heronemus, United States Navy. I am attached to the Portsmouth Naval Shipyard. My present assignment is that of Shipbuilding and Repair Superintendent in that Shipyard.

Q. How do you spell your last name, Captain?
A. H-E-R-O-N-E-M-U-S.

Q. Please describe in some greater detail, the responsibilities of your present billet with particular reference to the USS THRESHER.
A. As the Shipbuilding and Repair Superintendent, I am responsible to the Production Officer for the proper and timely accomplishment of all assigned ship and shop work including manufacturing, with the exception of that work associated with the nuclear reactor plant and that work associated with the Combat Weapons System. In discharging these duties I have available to me my ship superintendents who number 17 officers, and I am directly responsible for the efforts of my progress branch, which comprises a total of 40 people. I have one secretary and one clerk. These are the people who work for me. Insofar as my relationship to the THRESHER is concerned, I reported here in September 1960, at which time THRESHER was at just about the 90 percent completion point. I finished building the THRESHER, got her ready for her first sea trials in the capacity of shipbuilding superintendent, took her on her sea trials, superintended the work during a subsequent availability--the availability which we call the December availability in the Yard--and then of course superintended her entire PSA from start to finish.

Q. Now there were civilian personnel on board THRESHER during her sea trials, were there not?
A. That is affirmative.

Q. Did those personnel work for you?
A. Two of those men worked directly for me in my Progress Branch,-- Mr. (b) (6) and Mr. (b) (6) [redacted]. As progressmen, these two gentlemen assisted my ship superintendent, and in particular were responsible for measuring our physical progress day by day on the work assigned to be done, for helping to round up missing material, to also finish the job; and during the last few weeks they actually acted as combination progressmen and schedulers in that they prepared the daily checkoff of work remaining to be done, and assisted us on counting down on the work items until we were finally satisfied that things had been

done. The reason they went to sea was for this particular reason, to assist Lieutenant (b) (6) in looking into any discrepancy which was generated during sea trials, to decide what should be done about it, and to organize any discrepancies into what we call area completion schedules, and to have all of this done by the time the trial was over so that we could decide whether or not we were going to need eight hours, or three days or three weeks to finish up.

Q. Did you assign the sailing list for THRESHER?
A. I did. It is my responsibility to forward to the commanding officer of the ship an official Shipyard sailing list.

Q. The sailing list only of the civilian personnel?
A. The entire sailing list of civilian, Shipyard personnel and military Shipyard personnel, and all others who ride on tests.

Q. Do you have in your possession a copy of that sailing list?
A. I do.

Q. With reference to the list of civilians appearing thereon, can you state in general terms the status of those civilians?
A. I can. May I refer to my notes?

Q. Very well.
A. There were four members of our Design Division who went out on these trials. Two of these gentlemen, Mr. (b) (6) and Mr. (b) (6) , went out for the prime purpose of checking out certain instrumentation that has been installed for the David Taylor Model Basin, to see if it were checking out correctly. This instrumentation was to be used during trials to follow the Shipyard availability. Mr. (b) (6) 28-year old Marine Engineer, had been with us for a little over six years and was recognized as a very fine and coming young man in the field of submarine noise overhaul. Similarly, Mr. (b) (6) , who had been with us for about 16 years, was a specialist in his particular business, particularly the instrumentation associated with measuring submarine noise. Mr. (b) (6) another young mechanical engineer, went out to pay particular attention to a special installation we had made in the thrust bearing in this submarine. This was to figure in later trials. Mr. (b) (6) , a mechanical engineer, had been with us a little less than four years, went out to help complete one of our sea trials which the Shipyard had asked to be accomplished during this sea trial. We had four items of test memos that were injected into the trial agenda. This particular test was a hull compressibility test in which Mr. (b) (6) was going to measure the amount of variable ballast which was the difference in the amount of variable ballast at certain depths as the ship dove, to see if we could figure out by exactly how much the submarine would--

Q. Captain, it won't be necessary to go into so much detail. It is their status we want.
A. All right. We had (b) (6) from the Combat Systems Division. Each of these men had specific responsibilities. Each was a project engineer. Mr. (b) (6) in particular was responsible for the operation of the torpedo battery. Mr. (b) (6) and Mr. (b) (6) whom I have already mentioned, were my progressmen out assisting my ship superintendent Lieutenant (b) (6) . Mr. (b) (6) of the Quality Assurance Division, had gone out to assist these gentlemen in carrying out one of the other test items that remained for accomplishment of sea trials. I had three artisans aboard, (b) (6) Marine machinist who had gone out because of his particular skill with hydraulics and air systems. Mr. (b) (6) had gone out--Mr. (b) (6) is an electrician who had particular skill in IC circuitry; and in addition to them, Mr. (b) (6) , a leadingman refrigeration and air conditioning mechanic,

had gone out because we wanted to once more check out operation of two of the air conditioning plants on board ship. He had been with these plants right from the time the ship was built, and volunteered to go out to check them out once more. This covers the civilians from the Shipyard who were on the sailing list. Now there was one gentleman, Mr. (b) (6), from the Sperry Piedmont organization who had gone out to superintend checkout of the AMC system. We had Mr. (b) (6) of Raytheon, associated with the large sonar; Mr. (b) (6) of the Naval Ordnance Laboratory who is associated directly with another sonar installation; Mr. (b) (6) from another division of Sperry Rand Corporation who was also associated with the same sonar equipment I mentioned above for Mr. (b) (6). This comprises the list of civilians. In addition to them, Lieutenant Commander (b) (6), who is our technical officer, Assistant Design Superintendent, who arrived at this Shipyard about the same time I did; Lieutenant Commander (b) (6) who was our Planning and Estimating type desk officer for the THRESHER who also arrived at the Yard at the same time I did; and my ship superintendent Lieutenant (b) (6) who had been in this Shipyard for ten months.

Q. And the balance of the names, Captain, identify the officers and members of the crew of THRESHER?

A. Yes, sir.

RADM DASPIT: Lieutenant Commander (b) (6), is from DEPCOMSUBLANT.

WITNESS: That is correct. He did not appear on my sailing list. He was taken care of by Captain Harvey himself.

Q. Can you tell us from your own knowledge and experience the competence, in general of the personnel whose names you have read to us?

A. Yes, I can. All three of the officers whose names I've given you, were qualified in submarines, had operated at sea in submarines and wore gold Dolphins. Commander (b) (6) had operated in submarines for a number of years before he became an engineering duty officer. His specialty was electronics with particular emphasis on sonar. Commander (b) (6) had operated for at least four years in submarines and had served in the Pacific. His particular area of competence as an ED was in applied mathematics. Commander (b) (6) actually held a doctorate in applied mathematics. Lieutenant (b) (6), the youngest of these three, had come to me as a officer student, having completed a tour of duty in the USS CAVALLA, where he qualified. He held a master's degree in naval architecture and marine engineering from Webb Institute Insofar as the civilians are concerned, I have already highlighted enough to indicate their competence. Each of them was a specially picked man, a recognized expert in the particular area for which he went on board. Mr. (b) (6) for instance had worked throughout this entire availability as the project engineer, tying together all of our work on this BQQ2 installation and I believe I indicated to you, each of the other individual's specific area of competence. The sailing list had been cut down to the least number of people required to go out to take care of tests and to observe operation of the ship because of the great requirement of keeping down the number of people on any one of these ships and anyone extra just adds confusion.

Q. Is there anything which you wish to add about your own personnel, Captain?

A. No, I believe I have covered everything.

Q. All right. Now returning to the period of the post shakedown availability, just preceding the actual sea trials, did your work bring you in close contact with the commanding officer of THRESHER during this period?

A. That is affirmative. Of course there are two commanding officers to be mentioned in this instance. I did not get to know Captain Harvey anywhere

near as well as I had known Captain Axene. I did know every officer in the THRESHER wardroom. I knew them well, particularly the commissioning group. There was one new officer who had just reported to THRESHER, a Lieutenant (b) (6) went out with them, whom I had seen only twice before they went to sea. The others I had known quite well.

Q. Now in the most general terms, and remembering that no classified information is to be divulged, can you state the general scope of the work done under your supervision during the post shakedown availability?

A. This was a large availability. We worked on 875 different job orders. Now each job order connotes a different piece of work. Many of these job orders were very small; at least two of them were very large. Two different ones totaled as much as 6000 man days work of effort each. I can tell you what I consider to have been the principal or the most significant of those items. First of all we conducted a more than one hundred percent hull integrity surveillance inspection. This was a special hull integrity surveillance inspection that was generated as a result of the shock trials. Second, we accomplished a considerable amount of stiffening of flat plate structure in the variable tanks--the hard tanks--in this particular hull. Third, the THRESHER had been delivered with a hydraulic fluid which was designed to prevent dieselization. It was a phosphate ester fluid. It had been proved unsuccessful. We replaced all of that hydraulic fluid with a more standard petroleum-based fluid and as a result of this job we had to disassemble and reassemble every actuator and other valving device in which any kind of a packing or seal was located. We installed a new version of the PUFFS sonar. This was the largest job from the point of consumption of time and insofar as the amount of the ship on which we had to do work. We modified a maze of piping, hydraulic and air and drain piping forward of the ship control stand--what we call the pipe lock. This was done to rearrange and provide better order in this particular area. We inspected and tested certain silbrazed joints in seawater systems. We installed a new type of garbage ejector unit, one which had a non-jamming ball valve for a muzzle door. We did considerable work on the electronic masts and the electronic equipments. We modified the radiation shielding on the lower portion of the bulkhead at Frame 52. We replaced all of the flexible hoses and all of their end fittings. This was a sizeable job. We installed b(3) 1 new main condensate system pumps and repiped and rebuilt essentially the entire main condensate system. We replaced 53 auxiliary power electrical controllers. We installed a special electronic cooling pump. We accomplished various self-noise reduction jobs which were of the nature of dampening of outer shell plate and smoothing up of the outer surface of the bow. We installed a new sea water system to one of the air conditioning plants inboard of the backup valve. And that comprises the majority of the work in that short list.

Q. Captain, in a word now, were you responsible for the satisfactory performance of that work?

A. I think it is best to refer to the Shipyard organization chart at this point. I held myself responsible for the satisfactory accomplishment of this work but in the last analysis any work done by anyone in the yard is subject to a chain of responsibility which goes from the individual workman up through the leadingman, quarterman on up through the chain of command within the shops. The only authority I have over the personnel working in the shops is what we call coordinating type authority and I exert that authority through my ship superintendents by coordinating the senior trade supervisors assigned to each particular project.

Q. Was the work satisfactorily completed for the purposes of the sea trials, in your opinion?

A. In my opinion and to the best of my knowledge, this ship was in outstanding condition to go on sea trials.

Q. Now, directing your attention to Monday, the 8th of April 1963, did you have a conversation with the commanding officer of THRESHER with regard to whether or not he would be ready to go to sea?

A. That is affirmative. On Monday, the 8th of April, we came out of drydock. The ship was a little late coming out. She came on around and stopped at Berth 11 Bravo. After she had tied up I went below to discuss the items remaining on the work list which had not yet been completed. I took (b) (6) and Lieutenant Commander John Lyman, and the Executive Officer came into the wardroom and joined in the conversation. At that point we identified those things which had not been done and we discussed the nature of several of them. It was at about quarter of three, as I recall, that Commander Larcombe came down into the wardroom and asked, "Are you people ready to go to sea? SKYLARK will be under way in another 15 minutes." The answer given to Larcombe was, "Tell her to sail." Now, it is my recollection that I was the first to say this, but Harvey then said, "Tell her to sail."

Q. Did there appear to be any reluctance on the part of the Commanding Officer of the THRESHER to make this acquiescence?

A. None whatsoever.

Q. You say there were several items of work remaining to be done. Very generally, can you tell us the names of these items?

A. Yes. There was still a little bit of touch-up painting to be done in three places in officers' country. I had three items of alleged discrepancies involving the periscope which I did not understand. My people had worked the preceding 12 hours and they did not know exactly what was in the mind of the person that said the periscope wasn't all right. We decided to try the periscope and have them demonstrate this and we did that, and it turned out that the Commanding Officer said that the periscope was all right, so that took care of those three items right then and there. There was a small job down in the torpedo room that they wanted done in order to ease the handling of torpedoes. They wanted some lines scribed on the tracks so that they could visually see the cradles before they tried to throw the lever to engage the pins. There had been an O-ring leak on Actuator for low pressure valve AB16 that was completed that evening in about an hour. It was pointed out by me that in the condensate system there were nine plugs in this copper-nickel plugs -- which had been left in there for trial instrumentation which we thought they wanted to use on sea trials, and the Design Division had just informed me, "No, we are all through with probing that flow; go ahead and put in the final plugs..." which were to be seal-welded in place. I told Captain Harvey I had the people standing by to accomplish this job, and would he like me to do it now. He said, "This is not of significance now. Keep your people off the ship so I can get cleaned up and get to sea."

Q. Did you go over the planned sea trials of the THRESHER?

A. With the Commanding Officer?

Q. Yes.

A. I had not. I was in possession of the proposed sequence, the proposed agenda. I had told him the four items which we wanted him to accomplish for the Shipyard. I had never discussed the details of the trial agenda, other than the total timing. I knew which tide he was going to sail on and what tide he was going to come back on.

Q. To what degree are you responsible for pre sea trial planning of the events to be conducted during the test?

A. This responsibility is a joint effort between the Shipyard and the commanding officer and we approached this as a joint effort, which is documented. We organized and conducted a very thorough post overhaul testing trial period before we started our fast cruise. After that was over, it was then the ship's commanding officer's responsibility to conduct dock trials and fast cruise. He did that and he certified in writing that he had done so.

Q. Once the sea trials got under way, did you have any control over them?

A. No control whatsoever.

Q. Did you have any objections to the items listed for the planned sea trials?

A. No objections.

Q. Were you satisfied with them?

A. I was satisfied that the four items which the Yard required to be done seemed to have been properly scheduled for the right amount of time and at the right time. I had no objections to them.

Q. Now a final question. What was your best information, best information available to you, for the readiness of sea of THRESHER ~~whn~~ WHEN she commenced her sea trials?

A. I say again that I have known no ship around this Shipyard or elsewhere that has been in as high state of readiness for sea trials as THRESHER. This actually was a bit unusual because of the way our schedule had sort of been thrown out of kilter the last few days. We had been forced to come back from the noise basin and go back into dock and because it was over a Palm Sunday and because of the complications of getting escorts, we had agreed--the Captain and I had agreed--to let the ship stay in dock for four days. During those four days I was able to correct, as I stated earlier, all but those three minor discrepancies, and I have never known a ship to go to sea with so few discrepancies remaining for accomplishment.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Hushing:

Q. You mentioned on your sailing list that there were a number of civilians and officers included. Did anyone on your sailing list object to going on this trip?

A. I have no knowledge of any objection.

Q. Did anyone say he didn't particularly want to go?

A. It has been told to me--

Q. From your own knowledge, did anyone state to you--

A. From my own knowledge no one, -- in fact to the contrary. To my own knowledge everyone was a volunteer.

Questions by a court member, CAPT Osborn:

Q. Captain, the original sea trials started--not the sea trials--the original fast cruise started somewhere around the 23rd or the 24th of March in which considerable discrepancies were discovered. Were all of these discrepancies properly

tested prior to the time she went to sea; was there anything that was untested?
A. To the best of my knowledge, I can verify that every one of those discrepancies turned up by the first three days of fast cruise had been absolutely finished and sold.

Q. What you mean by sold is it was accepted by both the ship and shipyard?
A. Yes, ship and the Shipyard, yes, sir.

Questions by a court member, CAPT Hushing:

Q. One more question. You mentioned many items of Shipyard work during your testimony, I believe. Did the Ship's force also have work items to be accomplished during this availability?
A. The ship's force had a tremendous amount of work to accomplish during this availability. The exact way of describing this, I guess is to say that ultimately they had the responsibility of assuring that everything in that ship was fully ready, everything other than that on which we had worked was fully ready to go back to sea.

Q. When both the shipyard and the ship's force have work to do in the same system, this often causes problems of divided responsibility, doesn't it?
A. This is affirmative.

Q. Is there a standard procedure within the Shipyard for insuring coordination of such work and satisfactory system completion prior to going to sea?
A. There is. This post overhaul test and trial program tested systems. At the point where anyone of these tests items had been accomplished, ships force assumed responsibility for that system. From that time on, if anything went wrong in that system and a particular component had to be removed for further overhaul or something had to be done, we used what we called our ripout re-entry procedure and our tagout procedure and literally I passed the baton from one to the other.

Q. So that then with this procedure there was always a definite responsibility assigned for systems and for components between the Shipyard and the ship's force?
A. That is affirmative.

Q. And should a system be tested and delivered to the ship's force for operation and later a necessity found for entering, there was a ripout procedure which defines the area of ripout and defines the work to be done and the manner in which the ripout was to be cleared?
A. The retest was specified.

Q. Is this documented in Shipyard procedure?
A. Yes, it is documented.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing else to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

Captain W. D. Roseborough, U.S. Navy, was called as a witness for the court, was advised of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry and examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rank, organization and present duty station.
A. W. D. Roseborough, Captain, U.S. Navy, Planning Officer, Portsmouth Naval Shipyard.

Q. Captain, please describe the nature and extent of your duties in your current billet.
A. As Planning Officer, I am the head of the Planning Department, consisting of the Design Division, the Planning and Estimating Division, and two other divisions, the Nuclear Power Division and the Combat Systems Division are jointly responsible to the Planning Department and the Production Department. The duties of those two divisions are so overlapping that the organization has been set up so that the head of each of those divisions reports on certain matters to the Planning Officer and the Production Officer.

Q. Now, this court has heard evidence that the post shakedown availability period of THRESHER was extended from time to time, and that the dates appointed for her sea trials were accordingly postponed from time to time. Are you familiar with the background of these facts, the causes of the postponements?
A. Generally, yes.

Q. Can you give us, in general unclassified terms, the sequence of events which would throw light on it?
A. The THRESHER post shakedown availability, like any other new construction post shakedown availability, is primarily to provide an opportunity to complete or correct any deficiencies that were uncovered, and I say this, any deficiencies that were uncovered during the Board of Inspection and Survey preliminary acceptance trials, or uncovered by the Commanding Officer of the ship during the shakedown period. Certain additional work is frequently authorized to be accomplished in order to test out additional equipment which may be authorized and directed to be installed during this time. In the particular case of the THRESHER, her post shakedown availability was delayed considerably longer than is average or is standard, because she was the first of a new class and it was deemed prudent and most beneficial to the future development of that class in order to give her as long an operating time as was possible to reveal any minor deficiencies that a longer operating period would tend to reveal. Have I covered this sufficiently?

Q. Captain Roseborough, could you give succinctly the factors contributing to the duration of the post shakedown availability?
A. Yes, I think so. In addition to the preliminary acceptance trial items and the subsequent items reported by the ship's force, immediately before the THRESHER started her post shakedown availability she was subjected to a series of underwater explosion trials to further determine the continuation of a program to determine to the best of our ability the shock resistance of this new design. Also, another large and controlling item was the installation called PUFFS, since pressure is also a new order of magnitude

and the installations which have been made to reduce her noise capabilities, or noise signatures, we were requested to do significantly more modifications in that area, things which had been learned subsequent to the time THRESHER had been completed, roughly one year before the start of her ~~PSO~~ PSA. These are the major work items. There are many, many small ones that I could go into in detail, but they are of the nature that would not be controlling in themselves, only contributing to the size of the workload to be accomplished.

Q. Now, was there any indication to the Shipyard that it was highly desirable that the ship be returned to its operational status at the earliest safe moment?

A. Well, yes, that is our standing instruction, to complete all availabilities within the availability and at the earliest safe time--in advance of the scheduled availability if possible, and we have done that on two recent short availabilities.

Questions by a member, RADM Daspit:

Q. As you say, it is normal for pressure to be put on the shipyard to meet every date. Was there any undue pressure put on in this instance for this particular ship?

A. I wouldn't say there was any undue pressure, no, sir. Of course, it was embarrassing to all of us here in the Shipyard to not have completed the work as we understood it at the time the original availability was set up; but, as the work grew in the areas that I have mentioned, each time we reported that the scope had increased and requested the extension we thought was the minimum necessary to complete a safe availability. As is natural, with the importance of this submarine, as with any others, operating time is valuable. We were, of course, requested to complete as soon as could be done, sir.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

Mr. President, I think in answer to Admiral Daspit's last question I would like to read a message here. This was in connection with our request of the 18th of January --

Question by counsel for the court:

Q. Is this a classified message?

A. No, it is not.

The witness continued his statement, as follows:

Mr. President, I do not consider that as exerting any unnecessary influence or urgency on the Shipyard. That is essentially standard operating procedure.

DEPCOMSUBLANT Message R 19175ØZ was offered in evidence. There being no objection it was so received.

REPORTER: This will be Exhibit 46.

Question by the president, VADM Austin:

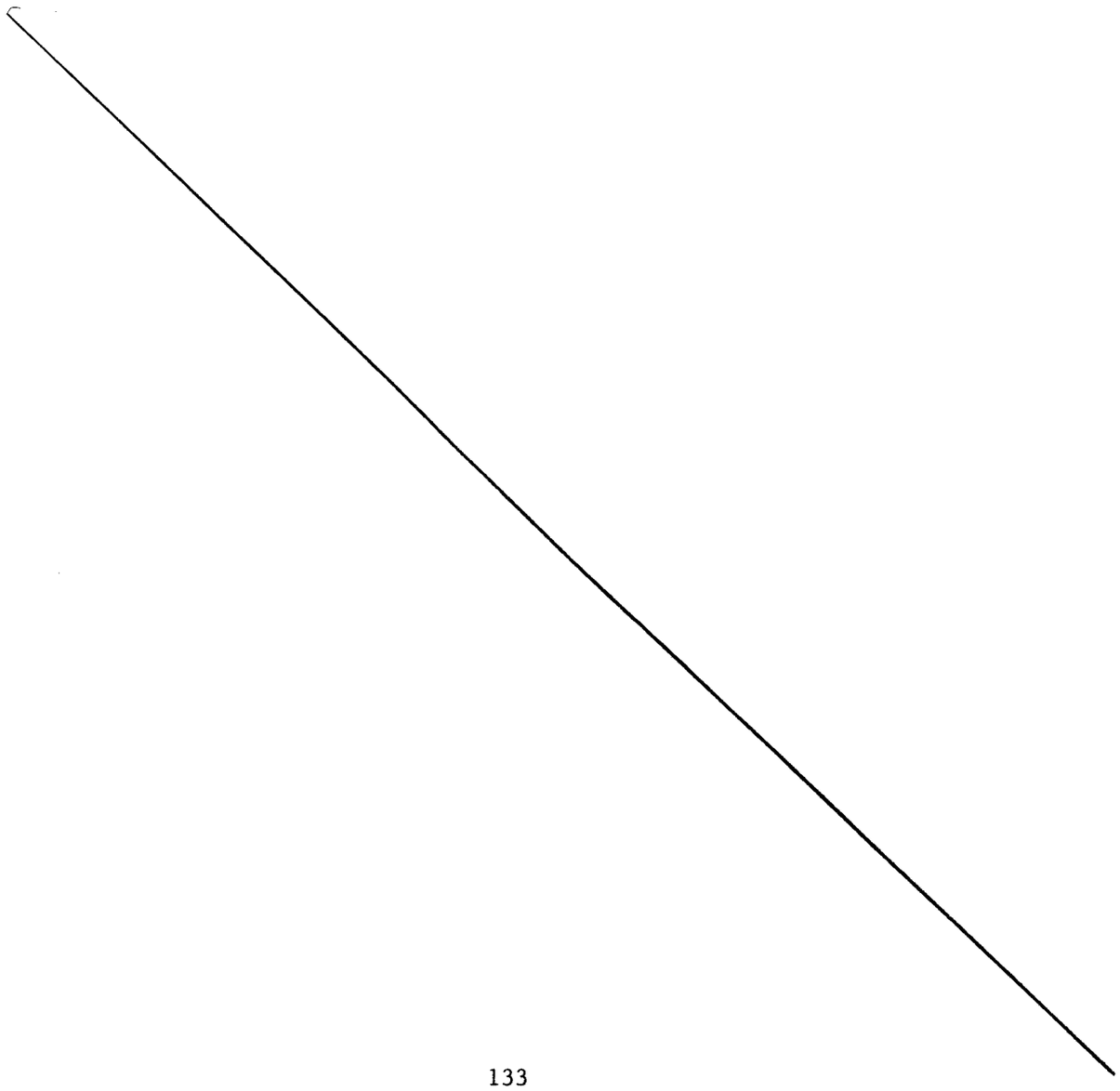
Q. In order not to have any misunderstanding reading out of context, read the whole thing; it's not too long.
A. (The witness read Exhibit 46.)

The witness stated that he had nothing further to introduce at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

PRESIDENT: The court will recess to attend a Memorial Service. The time of reconvening is indefinite.

The court recessed at 1520 hours, 15 April 1963.



The court opened at 1632, 15 April 1963.

All persons connected with the inquiry who were present when the court recessed are again present in court.

Vice Admiral Elton W. Grenfell, U.S. Navy, was called as a witness by the court, was warned of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry, and examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Please state your name, rank, organization and present duty station.
A. My name is Elton W. Grenfell, Vice Admiral, U.S. Navy; I am Commander Submarine Force, Atlantic Fleet. My operation headquarters is in Norfolk, Virginia.

Q. In connection with those official duties as Commander Submarine Force, U.S. Atlantic Fleet, you hold the responsibility in the case of THRESHER, a responsibility?
A. I do.

Q. Please state it, sir.
A. My responsibility in the case of THRESHER is to make sure that her operations were run in accordance with the regulations of the Submarine Force, Atlantic Fleet.

Q. Have you any information to give us in connection with this tragedy?
A. I have prepared a statement which I would like to read, if I may, sir, concerning the THRESHER incident from the operational viewpoint. I will submit a copy of it to you, also, if you desire. I had been in Annapolis this day, Wednesday, the 10th, making a presentation to the Polaris Industrial Organization annual meeting at Annapolis. On returning from Annapolis, Maryland at about 1420R on Wednesday, 10 April, I proceeded from NAS Norfolk to my quarters to change uniforms. At about 1435, my Chief of Staff called to advise of THRESHER's status, and I forthwith hastened to my headquarters, arriving about 1450. On arrival I found that the following events had taken place. My headquarters had received at 1312R, by ASW hotline, SKYLARK's initial report of loss of communications with THRESHER, reportedly occurring at 0917R. Operational personnel immediately commenced preparations for execution of SUBMISS/SUBSUNK. At 1332 my Chief of Staff completed a call to Vice Admiral Beakley, Chief of Staff and Deputy Commander in Chief, U.S. Atlantic Fleet, reporting the situation. About 1337R, SEA WOLF, SEA OWL and SUNBIRD, SUBLANT's units operating in Narragansett Bay Op Areas, were directed by my staff to proceed to the scene. At 1342, a request for aircraft search assistance was made to COMFAIRWING THREE in Brunswick, Maine. A P2V aircraft operating about 70 miles southwest of SKYLARK was diverted to assist SKYLARK, and additional aircraft were launched. Meantime, COMEASTSEAFRON was notified of the situation at 1348R and advised of a potential SUBMISS. A SAR machine accounting punch-out of all ships within 100 miles of SKYLARK had been made. A report situation message to THRESHER, requiring her immediate acknowledgment, cleared on both submarine broadcasts by 1355R. SKYLARK continued to submit fifteen minute SITREPS to COMSUBFLOT TWO in New London by direct CW transmissions, which were relayed to me via hotline. By 1435R, U.S.S. RECOVERY was diverted from about twenty miles south of SKYLARK's

position to join the search and rescue effort. By this time, Commander Submarine Development Group TWO, Captain F. A. Andrews, U.S. Navy, had been dispatched to embark in U.S.S. NORFOLK (DL-1) to proceed to the scene and assume senior officer of the search force. The KITTIWAKE (ASR-13) in port at Norfolk, Virginia, had been alerted to possible sailing orders. At 1521R she reported RFS. Following my return to my headquarters in the CINCLANTFLTOPCON Center, COMFAIRWING THREE was requested to provide four aircraft at the search scene as soon as possible. These were in addition to those previously mentioned. At 1647, aircraft were requested to drop emergency surface explosive signals in accordance with FXP-1 procedure, within a twenty-five mile radius of SKYLARK position. At 1720R, U.S.S. RECOVERY reported by single sideband radio being in the middle of a sizeable oil slick at about 41-45N. 64-48W. estimated to be lubricating oil by appearance and about one-quarter mile across. At 1750R I ordered my Deputy, Rear Admiral L. P. Ramage, USN, due to arrive in Quonset within the hour, to proceed to the search scene on a Newport based DD. He was directed to assume Senior Officer of the Search Force. At 1809R I initiated the SUBMISS message pursuant to my OpPlan. The U.S.S. RECOVERY reported retrieving, at 1830R, a small quantity of cork, tentatively identified as type used in submarine construction. At 1930R, it was my sad duty to commence notification of next of kin of THRESHER's overdue status, with a call to the Commanding Officer's wife, Mrs. J. W. Harvey. Simultaneous telephone calls were initiated to next of kin of all personnel by COMSUBDEVGRU TWO staff and Portsmouth Naval Shipyard staff in New London and Portsmouth.

Q. Admiral, THRESHER, being the first of her class and a new type of submarine, was an important submarine to your force, was she not?

A. This is correct.

Q. And her sea trials had been delayed numerous times. Can you tell us whether there was any great pressure being placed on either her Commanding Officer or on her shipbuilder in order to accelerate her return to an operational status?

A. No, I wouldn't say there was any great pressure put on the shipyard, and certainly not on the Commanding Officer. Delays in shipyards are common, and understandable in this day of our new complex submarine systems. We, the operators, were naturally not very happy about the delays. The PSA, which we thought only would take three or four months this time was double that time. Certainly I didn't put any pressure and none of my staff or the Deputy staff put any pressure on them, that I know of. The answer is negative.

Q. Who, in the last analysis, has the decision whether or not to put to sea, sir?

A. The commanding officer of the ship itself.

Q. Admiral, did you know the commanding officer of the THRESHER?

A. No, I knew him slightly; I've met him once or twice, but not as well as I know many other of my officers. He had been on duty in other oceans than I had been at the times we had come to submarine duty.

Q. Do you have any personal theory as to how this tragedy may have occurred?

A. I do, but because of the military security of the nature of my opinion I would prefer to give it to the court and let the court use their judgment whether they want to release any of it for public information.

By the President: In view of the fact that this is an open hearing, we had better save that until we close the hearing, and we can do that a little later.

WITNESS: And bear in mind that this only for military security reasons.

PRESIDENT: That is correct; that is the only reason we have to close the court, and will continue to be.

PRESIDENT: Recognizing full well the fact that you have just come from the second memorial service of today, and having attended only one, knowing how much emotional stress it places on you, I do want to ask just a few questions at this time.

EXAMINATION BY THE COURT

Questions by the President:

Q. Was any indication at your level that the THRESHER was not adequately manned from the Captain all the way through? In other words, was there any shortage of personnel, any lack of certain key ratings, or anything of that sort?

A. No, sir.

Q. To your knowledge, were the standard procedures for conducting a post shakedown availability overhaul followed in this case?

A. To the best of my knowledge they were followed completely in accordance with our regulations.

Q. Were any materiel conditions of the THRESHER brought to your attention which could in any way, in retrospect, have had affected her safety for this assigned dive?

A. None. At the time of her sailing I would say no. As we are all well aware of the shock tests that had been held, the reason she went to the yard after the shock tests was to repair any damage that had been done to her in the shock tests, which I'm fully confident was repaired during her yard overhaul, the post shakedown availability.

Q. Do you have any information, other than the classified information which you have referred to, which you would like to give to this court at this time, and which has not been elicited by our questions; anything that pertains to the matter under investigation whatever, directly or indirectly?

A. No, I don't think I do.

By the President: In that case, we will close the court and hear the classified part of the Admiral's testimony.

WITNESS: I do have one bit of knowledge about the personnel of the ship, before you close the court, that might be of interest. The experience level of the crew, I considered to be as good as on any of our nuclear ships that we have in commission today. The ship had been in commission almost two years. She had two officers that had been on duty aboard since commissioning; one within three months after commissioning. She had about thirty-five

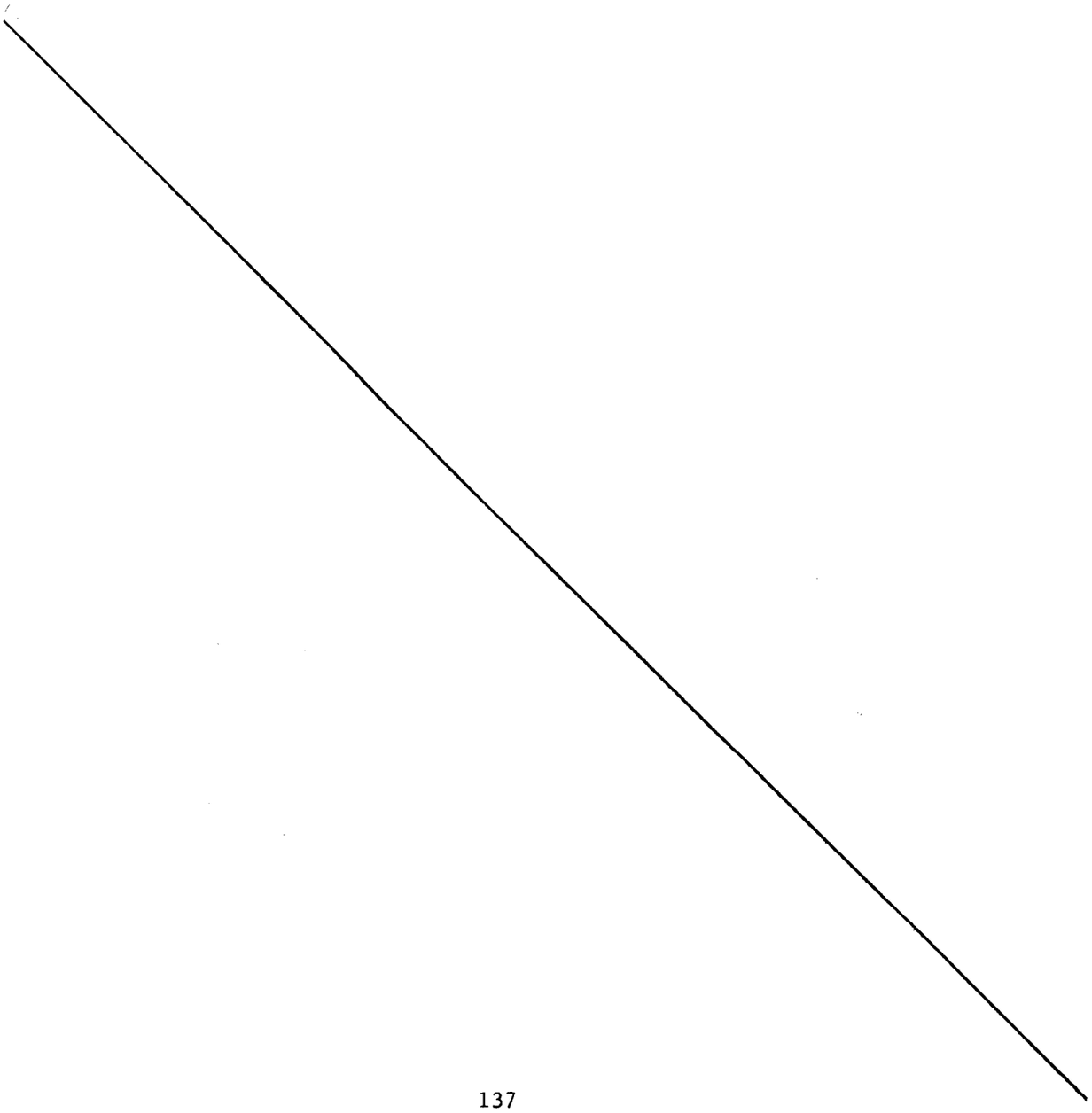
of her crew who were plank owners, from the commissioning, which is about one-third, which is well within our limits or criteria today, and she had about seventy who had been on board for over a year. Seventy of her crew were qualified, and here again this is a good high standard in the course of our operational situation today, so I feel that her personnel were really well qualified people, from the Skipper on down.

By the President: From your knowledge of the design of this ship, is there any doubt in your mind as to the possibility that at the depth in which it is indicated that this ship sank there could be any life on board at this time?

A. No, sir.

PRESIDENT: Gentlemen, I'm sorry but we're going to have to ask you to leave.

The court was cleared. All persons not connected with the inquiry withdrew.



WITNESS: In my prepared statement I had had in there--and I took it out--reference to the SOSUS system.

PRESIDENT: I'm glad you did.

WITNESS: We alerted the SOSUS system to this as soon as we got doubt in our minds, at around three o'clock in the afternoon. At that time SOSUS reported they had not had any contact to the best of their knowledge. Sometimes they do report to us of the THRESHER in that area. Later on, you know the rest of the story.

PRESIDENT: That was about what time?

WITNESS: About three in the afternoon. I have the exact time right here. 1426R, "SOSUS has not had contact on THRESHER." This was in a query; we called up there, right next door. Now, as you know, Captain Gordon and his analysts are analyzing this information that they got from that one station today, and they hope to have an answer up to you tomorrow, if it hasn't come up already, but this may be quite revealing to you, particularly in that part in which they say that they did hear machinery noises at one time and then when they terminated.

PRESIDENT: This is as firm a bit of information as we have. Do you have any interpretation of this information?

WITNESS: You mean from the SOSUS system?

PRESIDENT: Yes.

WITNESS: Well, it's too soon to judge, (b) (6) asked us not to, because he said that information that he had was completely tentative and that he would rather have his analysts look at it before he came up with anything official at all. Strangely enough, it does have a bearing on subsequent testimony which came up in the UQC conversations which you found out about Saturday and, incidentally, we didn't have all that information in our headquarters; you may not have known that.

PRESIDENT: We assumed you didn't or you would have given it to us.

WITNESS: None of it at all and that's another problem, but with that information it is my opinion, and the reason I cleared the court was that I wanted to talk about deep depths and things, and putting this together now it sounds like at about a b(1) feet he began to have troubles. As somebody, I think the UQC testimony said at minus three hundred, I think it was reported by Watson Saturday, he said sometime he was having minor difficulty, and this was followed by "Have positive up angle and attempting to blow." My feeling is that those minor difficulties were some type of flooding aft, which became obviously a major difficulty, and by the time it became a major difficulty I think he lost his power, at the same time, and by that time he had sunk to below test depth and he had had it. Now, that's my opinion, gentlemen, as I believe it now, and I believe that most of my staff agree to that philosophy.

PRESIDENT: I think that the logical analysis of what we know--

WITNESS: It is an opinion.

PRESIDENT: It is purely an opinion and when we get more information as to what that was, that we have identified there, then we may know more. There is a possiblilty that careful analysis of some of the bits and pieces that we have gotten here in this court may change this rationale, but as of now this certainly looks to be a logical conclusion.

A Member, CAPT Osborn: Admiral Grenfell, obviously there has been some analyzation with respect to the capability of handling certain types of casualties and their effects with respect to these things. Is it your opinion, since these casualties have been estimated and the size of them, is it the opinion of the people of your staff that there was an ideal, there was more of a margin of error in the ship than actually existed?

WITNESS: I don't quite follow your question. What do you mean by margin of error?

CAPT Osborn: My question is: Was the amount of gravy that the ship has--

PRESIDENT: Safety factors, operationally, is what you're asking about?

WITNESS: Of course, we've raised this question since the accident happened, Jim; it's a logical question to raise. It is of note, I think, that during the past month it has been brought to my attention, some concern about the capabilities of this type of ship; this class depth, about its capabilities to blow under certain conditions. This is recognized, first by me and my staff, when I questioned why they were keeping the air bottles in the Polaris type of ship on board after we shifted from air ejects to steam ejects. I was alarmed to see it because here's a big heavy thing--why keep it in there?--and I was surprised then that BUSHIPS had some concern about the blowing capabilities of that class and, therefore, they were going to use those bottles to have a reserve air supply in order to blow the water out quicker. This raised some question in my mind, so I asked questions of the POLARIS skippers and they said, "Well, we don't have much of a capability of blowing at that depth in a hurry." They didn't say they couldn't; they said, "in a hurry," and I said, "Well, this is unusual"; "Well," they said, "We normally rely on speed when we go deep" which is what I know the SSN's do, to control their ability of going up or down. The obvious answer here is if you don't have the speed, what are you going to do when you blow?

ADM DASPIT: Referring then to the message, "Having minor difficulty, have up angle, have attempted to blow," wouldn't it appear that at that time he had already lost his nuclear plant, or he would have used speed?

WITNESS: If not at that time shortly after he must have, I agree.

PRESIDENT: Because if he had an up angle--

WITNESS: Even with momentum he could have recovered.

PRESIDENT: The momentum would have pulled him up instead of going down as quickly as it is indicated he did go down.

WITNESS: That's right. As usual in these casualties in submarines you've got a series of events which ends up in a complete casualty, and it looks like that's what happened here. I noted in the testimony which I read in the papers --

PRESIDENT: Most of it has been in the papers so far because it has been mostly in open court.

WITNESS: No criticism in that vein. I think Watson said when asked the question, "What was the tone of voice?" or "Who was speaking?" he said he thought it was the Commanding Officer and the tone was calm and collected, or words similar to that. This, then, made me feel that at that time perhaps they didn't realize the seriousness, or maybe it hadn't happened at that time, but it certainly happened within the next five minutes. Anyhow, to go back to the other thing, when we were up here last Thursday with the Secretary, the question was raised along that line that you're raising the question, by the Secretary and by me, and Bill Heronemus, I think, stated that one of the future Polaris class submarines coming up they have opportunity to increase the diameter of the high pressure blow pipe. I don't know which one it is, which again indicated to me that someone else had concern along this line, too. Is it 23?

CAPT Hushing: Yes, sir, retro fitted to 616, and it's not only increased size, it's the whole series of changes which increases the amount of air by a factor of ten.

WITNESS: Here's this memo that I was looking for that gives the summary of the THRESHER personnel. I might not have quoted percentages from it right.

COUNSEL: I think that's good to introduce into evidence.

Summary of THRESHER personnel situation was offered in evidence, and there being no objections it was so received.

REPORTER: This will be Exhibit 47.

PRESIDENT: The question has been raised before this court as to the advisability of diving in such deep water, instead of diving in an area where you would have a nice flat bottom, just a little bit short of your crush depths. What is your answer to that?

WITNESS: For your information, I've already got my staff working on a study on that. Thus far, I don't think there's any such place in the Atlantic; there may be; I'm not saying there isn't; the study will reveal this very shortly. You have the very shallow shelf and then you go off in a canyon.

PRESIDENT: And unless you had a very well charted area of sufficient size with this bottom characteristic, you would give up a certain amount of safety which you have inherent in your high speeds.

WITNESS: If you don't have enough room underneath you, deep depth--

PRESIDENT: Enough room to take a little bit of angle and use a little bit of speed.

WITNESS: This, of course, brings you to another situation; assume that you can do this sort of thing, and as I say we're not sure; we're looking into it, and assume that a sub gets down to b(1) what are we going to do about it today, except it gives the gang aboard a chance to work on a casualty.

PRESIDENT: There's only one thing that it would give them and that would be in the absence of a flooded hull it would give them an opportunity to attempt to correct the situation.

WITNESS: Agree, agree.

PRESIDENT: Without a crushing affect.

WITNESS: Agree

PRESIDENT: But as you say, if they couldn't correct it, then you would have a worse situation then we have with this.

WITNESS: Today we would because we have no way of correcting it.

PRESIDENT: No way of helping them.

ADM Daspit: It has come up within discussion that minimum time to get the nuclear plant back on b(1) but under some circumstances -- it's different from a battery boat, you might get your nuclear power back on and do a lot more pumping, providing you control the leak. That's the only circumstance I can see.

CAPT Osborn: Admiral, there's one question I would like to ask, as a matter of personal opinion, which do you think is preferable from a standpoint of the status of the commanding officer making a deep dive, a fairly slow speed where he maintains his trim so if he were to have a power casualty he would be in a fairly good trim, or a relatively high speed and light, from a professional point of view?

WITNESS: I'd kind of like the high speed and light, Jim.

PRESIDENT: If you're sure you're right.

WITNESS: I think I'm correct. I've talked to hundreds of Skippers and I've been out with them and most of them do exactly that; go down light on these deep dives.

CAPT Osborn: This was exactly my opinion, Admiral, that most of the dives that I have made have been lighter and a little faster and hold the ship down.

WITNESS: We may have to go, --and here again this is something we're working on now,--to a policy of limiting our submarines to certain depths for normal operations, with the knowledge that the Skipper has, he can go to greater depths if he has to, and maybe go back to that old one of maybe only once a year to try a deep dive. I don't know; these things are going to be researched by both Admiral ~~Cleary~~ CLAREY's gang and mine too. This is all brand new submarining to many of us, all of us, and we're going into greater speeds in the days to come. Now we've got to take a look at this angling that the boys have been doing. I know it's a good idea and it has its usages, limited though they may be, but I think we've got to look at that a little more carefully than we have been, because we've had some very close ones along that line, so we're going to have to take a new look at all this business, not that we haven't been doing things right, I think we have so far, with what we've had to work with. Admiral ~~Cleary~~ CLAREY told me last night on the phone, in answer to your question to me a moment ago, that he has found such a spot in his ocean where he can do this, off the West Coast somewhere; he didn't say where, but he's going to send me the dope on it. Along that same line too, I think it is of note, and my dates may not be quite correct, but I think that it was around 1958, about the time the TRIESTE was coming to the Pacific, I boarded her in San Diego and went through it before she went out for a deep dive, and it was either at that time or shortly thereafter that we submitted the list to CNO asking them to look into the possibility of developing something like the TRIESTE for possible rescue use in such a case as we've had. I think also about that time, and maybe you can remember, Dan, the two Force Commanders got together and went on record in one of our annual meetings with an agenda item that we felt that the time had come when we should try to develop some means of rescue at those depths. Now I think that CNO took it and threw the ball to BUSHIPS and not much attention has been paid to it, because here again they felt that we had the speed and wouldn't need this sort of business, and there's not too many areas where you could use this sort of thing. I think they're probably looking at the Atlantic when they say it, and after all you don't have too many areas where you have a situation where you've got, let us say, eighteen hundred feet of bottom in a large area, but we must look at all of these. Whenever anything like this happens such questions are raised.

ADM Daspit: Let the record show that the reference to Cleary is to Rear Admiral Cleary, Commander of Submarines Pacific.

PRESIDENT: Joe, we certainly appreciate your coming to testify under these circumstances. We did want to give you a chance to give us what you could while you were here, so that it wouldn't be necessary to either take the whole court to Norfolk or have you come up here on short notice and fill in the gaps.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing else to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

The court adjourned at 1710 hours, 15 April 1963.

FIFTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Tuesday, 16 April 1963

The court met at 0900 hours.

All persons connected with the court who were present when the court adjourned were again present in court, with the exception of (b) (6) ;, who was relieved by (b) (6) as reporter.

Rear Admiral Lawson P. Ramage, U. S. Navy, was called as a witness for the court, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry, and examined as follows:

The witness was cautioned not to testify concerning classified matters in the open session of court.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. Please state your name, rank, organization and present duty station.
A. I am Rear Admiral Lawson P. Ramage, U. S. Navy, presently assigned duties as Deputy Commander Submarine Force, Atlantic Fleet, with headquarters in New London, Connecticut.

Q. As Deputy Commander, what are your responsibilities, sir?
A. As Deputy Commander,my responsibilities deal primarily with the material, personnel and training matters related to Submarines, Atlantic.

Q. Your responsibilites, then comprise three major duties. My questions will relate to each of them in turn. At the end of her post shakedown availability of this year, was THRESHER found wanting in any significant material deficiency?
A. None whatsoever, to my knowledge or to the knowledge of the staff at all. We were perfectly well satisfied with the state of training and material readiness for sea operations.

Q. Were you satisfied as to the adequacy of work performed on her here at Portsmouth and her readiness for sea from a material standpoint?
A. Yes, entirely so.

Q. Next are the areas of your responsibility for personnel management and training. In your judgement was THRESHER's crew adequate in numbers, experience and competence?
A. Yes. THRESHER had an excellent crew. About 80 percent of them were old timers, and they were well trained and experienced. Of course, there had been many transfers during this period of yard overhaul, but all of the people were thoroughly trained without question. There had been, as I say, some rotation due to other necessities of manning ships, fitting out and commissioning.

Q. Bearing in mind the extensive time of the post shakedown availability period, how would you evaluate the state of training of her crew on the 9th of April?

A. The state of training was perfectly adequate for the operations intended in every respect.

Q. What is your personal evaluation of the capabilities of the Commanding Officer of THRESHER?

A. Lieutenant Commander Harvey was one of the finest and most experienced submarine officers I know. I had no qualms whatsoever concerning his ability to handle the situation.

Q. Do you know what types of information pertaining to ship's safety, such as casualty studies, ballast margins, reactor recovering, and so forth, had been furnished the Commanding Officers of ships of this type?

A. I cannot reply precisely to this information. This has been under study, and such information is being furnished to the respective Commanding Officers of these new ships.

Q. During the search and rescue operations for THRESHER, did you head the naval forces engaged?

A. I did.

Q. Briefly outline for us the nature and extent of the search and rescue operations?

A. At about 1830 on 10 April, I arrived from Key West at Trumbull Airport in New London and was greeted by two members of my staff, one Lieutenant Commander (b) (6) , Nuclear Propulsion Officer, and my Aide, Leiutenant (b) (6) , and was informed by them to proceed directly to Newport to board a destroyer and proceed to the scene of THRESHER's last operations. I immediately boarded a helicopter that was waiting, and arrived in Newport about half an hour later, where I was met by Admiral Speck, Commander Cruisers-Destroyers, Atlantic Fleet. I was briefed by him. I also talked with Headquarters in Norfolk and New London prior to boarding the BLANDY at about 8:00 o'clock. At 8:30 the BLANDY had completed topping off with fuel and got underway, proceeding to sea and rendezvous to the last known position of THRESHER. At 2158 I sent a message to Deputy COMSUBLANT reporting we were underway and our estimated time of arrival on the scene. I requested a Task Group designator. And I sent a message to SKYLARK requesting the best and latest information on the THRESHER's intended movements at that time from the last known point of contact. At 2300 Commander Submarine Force Atlantic offered the use of ATLANTIS II, and I replied that we would be most happy to have her out there in this situation. At 2340 we received our Task Group designator as 89.7, and thereupon I promulgated our operation order.

Q. Are these times Greenwich time, sir?

A. Local times.

Q. Local times all. Thank you. Please proceed.

A. At 0505 the next morning we received a message from Commander Submarine Squadron TEN recommending that the SEA WOLF be utilized to obtain submerged radioactivity samples at increments of 100-foot depths where the oil slick was first seen and at the present location of the oil slick. At 0514 I sent a message requesting the Task Group Units to report their estimated times of arrival on the scene. At 0516 I directed the Unit Commanders to report when they commenced the search in accordance with the Operation Order At 0659 I received a reply from the SKYLARK to my request for information relating to the last known intended movements of THRESHER, which indicated that THRESHER was going to continue to operate in that vicinity; whereupon, at 8:00 o'clock I ordered all Units to reduce the radii of assigned search areas by 50 per cent.

Q. What was the reason for that?

A. I was convinced in my own mind, on the basis of information in the SKYLARK and the fact that RECOVERY had sighted this oil slick, that the THRESHER was undoubtedly down in that specific area. I saw no reason to extend the search on the basis of what she might do in a six hour period at 10 knots; since she was very definitely located in a much closer area, I could concentrate the forces available. I proceeded with BLANDY and directed all hands to keep on a very sharp lookout for debris or any other indications of possible disaster or casualty. At 0834 I received a report that the SEA WOLF had sighted a possible orange object by periscope at latitude 41° 23' North, and 65° 19' West, and we assigned destroyer SAMUEL B. ROBERTS to investigate. I have here a chart which shows the positions of all of these various bits of pieces of debris which were picked up and by whom and what time. This indicates that this particular object was well outside our inner area of search. (The witness submitted the chart to counsel for the court.)

Q. Is this true and correct to the best of your knowledge and belief, sir?

A. It is.

COUNSEL: I offer it to the court for the purpose of introducing it in evidence.

The said chart was submitted to the court, and was offered in evidence by counsel for the court. There being no objection, it was so received and marked "Exhibit 48."

Q. (By counsel for the court) This exhibit simply exemplifies the information which you have given us. Is that correct?

A. Yes.

Q. Proceed, please.

A. At 1045 on 11 April I received an unverified report that aircraft had sighted debris located at bearing 060, thirty miles from datum. Aircraft was detached to investigate this debris. I also received a report that SKYLARK had recovered pieces of cork and other debris. At noon we received a report from YARNELL that he had sighted a new oil slick bearing 060, thirty miles from datum. He was ordered to mark the slick and obtain samples. This was well out of range and, we felt, had little connection with the possible search. BLANDY, at 1231, sighted various small debris, including a piece of yellow material and rubber gloves, and we marked this debris with smoke floats. SUNBIRD was ordered to pick up the objects. YARNELL reported at 1300 that their oil slick sighted at 060, 30 miles from datum was widely dispersed, but they had recovered a sample. At 1301 we received information from SEA WOLF that she had possible electronic emissions on 23 kilocycles in her area and requested all ships to secure ranging and fathometer readings. We immediately ordered all units to cease underwater soundings and echo ranging. At 1330 we received a report from WARRINGTON that he had sighted rubber gloves and was able to recover one of them, which was later determined to be of the rubber hospital type with the trade mark "Pioneer" on the glove. At 1345 we received an emergency message from SEA WOLF advising that he held probable electronic emissions and a probable stationary target on active sonar. SEA WOLF requested permission to dive and further investigate. This permission was granted. At 1426 we sent a situation report advising that SEA WOLF was conducting submerged reconnaissance in the area and the nature of the debris that had been recovered by SUNBIRD in the area, including several pieces of plastic, one of which was identified as borated polyethylene. At 1435 BLANDY sighted and recovered one large section of plastic also identified as borated polyethylene. At 1518 SEA OWL was sent to assist SEA WOLF as a

relay for the underwater telephone. BLANDY proceeded to that vicinity. At 1630 SUNBIRD reported the recovery of an 18 by 14-inch piece of polyethylene, and the RECOVERY report also placed the original oil slick at 41° 45' North, 64° 58' West, and reported the recovery and delivery to SKYLARK of lube oil, fuel oil, and white plastic samples. At 1720 the LIND was designated to pick up debris from SUNBIRD and return it to Newport. BLANDY continued her close search over the best estimate of THRESHER's position, as did the SEA WOLF. At 1810 ATLANTIS II reported that, due to the state of the weather, she was unable to conduct any further hydrographic survey. At 2030 we sent a report advising that aircraft had been secured and that weather prohibited further transfers, and that sound survey was continuing as best as possible. At 9:00 o'clock, 2100, we received a message from the Chief of Naval Operations offering additional ships and equipment to assist in the deep search for THRESHER. At 2116 we replied to this and another message offering similar assistance, advising the desirability of having such sophisticated deep detection equipment sent out. At 2300 we received a COMSUBLANT dispatch indicating a desire for SEA WOLF to return to New London the earliest consistent with on-the-scene requirements.

The situation indicated no change either in the search or the weather, which continued very rough, with winds around 50 knots. At 0622 on the morning of the 12th we received from SEA WOLF a message indicating that all further searches failed to produce evidence of any pinnacles or any indications of sonar signals originating from THRESHER. Accordingly, the SEA WOLF was detached to return to New London. At 0713 the ATLANTIS II reported she had water samples aboard which had been taken in accordance with our direction in the vicinity of datum and that samples at all depths showed no indication of radiation above the normal background level. At 0721 we sent a report advising the nature and results of SEA WOLF's search, which were negative, and that the SEA WOLF was returning to New London; that weather conditions were still unsatisfactory for personnel transfer; and a report concerning the samples that the ATLANTIS had obtained. At 1308 aircraft reported sighting considerable debris at about bearing 169°, nineteen miles from YARNELL. This was approximately 10 miles north of datum at that time. YARNELL was dispatched to the scene of the debris and subsequently recovered three pieces of relatively new lumber with no significant characteristics. Then around 3:00 o'clock, 1520, on the 12th we received a dispatch from Commander Submarine Force Atlantic indicating his desire to re-orient the search group and transfer command to COMSUBDEVGROUP TWO. We went ahead with plans to transfer the people and release the various units in view of the fact that better equipped units were already enroute to the scene. At 4:00 o'clock, COMSUBDEVGROUP TWO was transferred to BLANDY from the NORFOLK in order that I might brief him on the state of the search and what I considered the next and most desirable steps to take.

Q. Who is COMSUBDEVGROUP TWO?

A. Commander Submarine Development Group TWO, Captain Andrews, whose headquarters are in New London. He was Commander, at the time, of the Task Unit 89.7.2.

Q. Is he still out there?

A. He relieved me at about 1630 to assume command and is still conducting the search in the area. At 1750 the SKYLARK, YARNELL, NORFOLK and SEA OWL were also detached to return to port, as we had information that the THOMAS JEFFERSON, RED FIN, and GILLIS, an oceanographic ship, were enroute to the scene. At 1846 we transferred Captain Andrews to the WARRINGTON, and we, on the BLANDY, departed the scene. Shortly thereafter we received a message from COMSUBLANT requesting that Lieutenant Watson of the SKYLARK be transferred to BLANDY and return to Newport in order that he might appear before the court of inquiry at the earliest. We proceeded to pick up Lieutenant Watson and two enlisted men, Mowen and (b) (6) , to take them off the SKYLARK at 2100, to go with the SKYLARK's UQC, underwater telephone log, and it was not until I saw this log that I or anyone elseoutside of SKYLARK had any indication that the THRESHER had reported an up angle, attempting to blow, just prior to her final and last garbled message. I might add that, whereas we had come to this conclusion--I had come to this conclusion very early on the morning of the 11th, this additional information would not have changed anything that we did subsequent thereto in any particular as far as the search was concerned. It would, however, enable all those in responsible positions to have made an initial evaluation much sooner of the whole situation. BLANDY docked at Newport at 9:00 o'clock on the morning of the 13th, whereupon the SKYLARK personnel were transferred immediately by helicopter to Portsmouth.

Q. Do you have the report from SEA WOLF made to you concerning the receipt of possible electronic emissions on its equipment?

A. I do. I have here the original SEA WOLF report on her search operations.

Q. Is it classified, sir?

A. It is classified as Confidential.

Q. What is the reason for its classification?

A. It is classified primarily because it discloses capabilities of various sonar equipment.

Q. May I see it?

The witness submitted the report to counsel for the court.

COUNSEL: I offer it to the court for the purpose of introducing it in evidence, but not to be read in open court at this time.

The report was submitted to the court, and was offered in evidence by counsel for the court. There being no objection, it was so received and marked "Exhibit 49."

By counsel for the court:

Q. Without divulging classified information, can you state in general terms what that report reveals?

A. This report gives the times and nature of the various electronic emissions which the SEA WOLF reportedly heard.

Q. In your view, does that report establish that human life persisted in THRESHER a considerable period of time following the casualty?

A. None of the signals which the SEA WOLF received equated with anything that possible could have originated by personnel.

Q. Human beings?

A. Human beings. Undoubtedly, in this situation there could be any number of noise sources from a submerged submarine under pressure-mechanical as well as electrical.

Q. Admiral, have you formed any opinion in your own mind as to the possible cause of the loss of THRESHER?

A. Well, I believe everyone has some personal opinion as to what caused this fatal dive.

Q. Do you have anything that you think might help the court in this respect?

A. Nothing which I would care to state in open session.

COUNSEL: Very well. I have no further questions at this time, sir.

EXAMINATION BY THE COURT

Questions by a court member, CAPT. HUSHING:

Q. Admiral, do you have on your staff technical personnel who are responsible for the type of work authorized in post shakedown availability such as this?

A. I do. I have a staff of technically qualified engineering personnel who have followed the whole course of the planning and the work accomplished on the THRESHER from the outset, and one of my officers was on board the THRESHER to witness these trials, as you well know, Lieutenant Commander (b) (6);. They kept me fully informed of the progress of all work from its inception to completion.

Q. Did any of these officers or personnel visit the Portsmouth Naval Shipyard during the post shakedown availability to ascertain visually and by contact the condition of THRESHER?

A. Many, if not all, of these officers visited the Portsmouth Yard not once but many times.

Q. Did they report to you on the conditions of THRESHER as they found them?

A. They did.

Q. Did any of their reports indicate unsatisfactory workmanship?

A. No, sir.

Q. Did any of their reports indicate to you any lack of motivation on the part of the Shipyard management or personnel on the early delivery of THRESHER back to the fleet?

A. Various difficulties were reported in connection with completing some of the installations on time, but these were more to do with the nature of the installation than anything to do with the ability of the workmen or their motivation. These were just natural and unforeseen difficulties which came up in the course of installing some of these new equipments, running piping and things of that nature, as was necessitated by these installations.

Q. During the last three months of the post shakedown availability, starting from 1 January, or thereabouts, did their reports to you indicate any unusual technical difficulties?

A. No, I would say not any unusual technical difficulties.

Q. Did their reports to you prior to the THRESHER'S last trial indicate satisfaction with the work done at the Portsmouth Naval Shipyard during this PSA?

A. Everyone seemed to be completely satisfied and stated so on completion of the PSA.

Questions by the president:

Q. Admiral Ramage, were any ships, other than those under your command in the general area of the datum from which the search was being conducted, was there any commercial shipping sighted or was there anyone evidently hovering around there, snooping, to your knowledge?

A. There was only one stranger that entered the area at all during the time I was out there, and this was one Norwegian trawler. I have the name, the number and the time. At 1243 on the 12th of April a small fishing vessel entered the area, was identified by the LIND as the JUVIEL, with hull number M-1025, flying a Norwegian flag.

Q. Admiral, did the Commanding Officer of the ASR-20 report to you any strangers whom he had observed in the area?

A. None whatsoever, sir. I got no such report from him.

Q. If the JUVIEL, at 1243, was identified as a Norwegian fishing vessel, this might have been a vessel formerly reported to this court by the Commanding Officer of the ASR-20, which he was unable to identify?

A. This was on the 12th, I should remind you.

Q. Yes, his sighting was earlier. There is small probability that this vessel and the one he failed to identify could have been the same ship.

A. I rather doubt it, because this small vessel seemed to be transiting the area, presumably operating or fishing in those waters.

Q. The diagram which you have submitted (Exhibit 48) encloses within a radius of 20 miles, I believe, all debris that was recovered?

A. Yes, sir.

Q. What, Admiral, is the depth of the water in this 20-mile radius circle?

A. Well, it averages between 1300 and 1400 fathoms.

Q. Are there any pinnacles in this area which would be much - that is, significantly - shallower than the average of 1300 fathoms?

A. There are no pinnacles shown on any chart, to my knowledge, in this area. However, it was my natural supposition that there might be pinnacles which had not been previously discovered, and as such, I recommended very strongly that Captain Andrews continue with a very careful sweep north and south, east and west, throughout the area until the more capable surface ships arrived, as soon as the weather moderated. It was impossible for us to get any meaningful soundings when I was out there, because the weather was rough, and it was difficult to get fathometer readings. This he did, and he reported negative results on pinnacles. We had, on the BLANDY and, I believe, on the YARNELL, and the SEA WOLF also, some indications of shallower soundings, but on further analysis, these were proved to be false and merely transients in the equipment which, by proper tuning, were eliminated.

Q. You picked up Lieutenant (junior grade) Watson at 2100 on the 12th to give him transportation back to appear before this court, and at that time you had a conversation with him which brought to your attention for the first time, I believe I understood you to say, information regarding the message which indicated that THRESHER was having difficulty and a positive up angle. Do you remember exactly what Lieutenant (junior grade) Watson said to you at this time was the message that we refer to? In other words, do you recall well enough what he said, to help the court determine what, at that moment, he thought he had heard?

A. Well, in the course of our discussion, after I had read the log and had immediately drafted a message in response to COMSUBLANT's request for the last three transmissions, I drafted that dispatch and turned it over for transmission. We then continued our discussion, and I asked specifically that, in view of all that transpired before the last and final transmission, what, if anything, did he hear on the UQC as might have been further warning or indication that the THRESHER might be in difficulty. I said, "Did you hear any sounds of blowing or breaking up or hull crushing, or any such noise as that?" And he indicated at that time, more or less on second thought, that he had heard such things. It hadn't occurred to him at that time nor to the Commanding Officer, because neither of these officers, nor anyone else on the SKYLARK, from what I have been able to ascertain, had any conception that anything could happen to this fine ship; that this always happens, that they lose voice communications with the submarine when they go below a certain layer. The submarine often indicates she might be having a small leak or other minor difficulties, and in due course they come back up and report their position. This, I believe, was foremost in their minds. They did not sense the seriousness, from what I gathered from the discussion at that time.

Q. As you have stated before, it would have contributed little to your ability to give any assistance to the THRESHER in such depths of water had you known this the moment you arrived in the area, but the court finds it difficult understanding how the Commanding Officer of SKYLARK would consider information of this nature as not pertinent enough to pass on to higher authority in the chain of command, and I just wanted to see if this conversation with Lieutenant (junior grade) Watson would shed any light on this particular facet of the problem.

A. I can very well appreciate the court's concern, and it was also inconceivable to me that anyone should have withheld such vital information, but apparently this is not too unusual in the normal course of events out there in such trials, and the fact that they had, as we all did, utter confidence in the ship, that it didn't ring a bell at the time, as it should have.

Neither counsel for the court nor the court desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing else to add at this time.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

PRESIDENT: The court will be closed.

The court closed at 0950 hours, 16 April 1963.

The court opened at 1710 hours, 16 April 1963.

All persons connected with the inquiry who were present when the court closed were again present in court except (b) (6) who was relieved by (b) (6) as reporter at this point.

Lieutenant Commander Stanley Hecker, U. S. Navy, entered.

PRESIDENT: Lieutenant Commander Hecker, the court has concluded that your conduct as Commanding Officer, U.S.S. SKYLARK, as revealed by evidence presented to the court, appears to be subject to inquiry. The evidence in question reflects that you failed fully to inform higher authority of all of the information available to you pertinent to the circumstances attending the last transmissions received by SKYLARK from THRESHER on 10 April 1963, as it was your duty to do, for an unreasonable length of time. The court wishes to emphasize at this time that this apparent failure on your part cannot conceivably have contributed in any way to the loss of the U.S.S.THRESHER and those on board. You are accordingly designated as a party before this court. Counsel for the court will now inform you of your rights as such. You may be seated.

COUNSEL: Before advising you of your rights, and in order that there may be no misconception as to your status, I would first like to read the definition of a party: "A party is a person subject to the Uniform Code of Military Justice, or an employee of the Department of Defense, whose conduct or performance of duty is 'subject to inquiry' or who has a 'direct interest' in the subject under inquiry and who is so designated as hereinafter provided.". "A person's conduct or performance of duty is 'subject to inquiry' when the person is involved in the incident or event under investigation in such a way that disciplinary action may follow; or which may affect his rights or privileges; or jeopardize his personal reputation or professional standing." "A person has a 'direct interest' in the subject of inquiry (1) when the findings, opinions, or recommendations of the fact-finding body may, in view of his relation to the incident or circumstances under investigation, reflect questionable or unsatisfactory conduct or performance of duty; or (2) when the findings, opinions, or recommendations may relate to a matter over which the person has a duty or right to exercise official control.

I shall now advise you of the rights of a party: "A party to an investigation by a fact-finding body shall have the following rights: (1) To be given due notice of such designation. (2) To be present during the proceedings, but not when the investigation is cleared for deliberations. (3) To be represented by counsel. (4) To cross-examine witnesses. (5) To introduce evidence. (6) To testify as a witness. (7) To refuse to incriminate himself, and to refuse to make any statement regarding any offense of which he is accused or suspected. (8) To make a voluntary statement, oral or written, to be included in the record of proceedings or investigative report. (9) To make an argument at the conclusion of presentation of evidence. In courts of inquiry only, a party has two additional rights: (10) To challenge members of the court of inquiry for cause stated to the court. (Article 135(d) of the Uniform Code of Military Justice and 0414.) (11) If charged with an offense, to be a witness at his own request and not to be called as a witness in the absence of his own request." "The party may be represented by civilian counsel if provided by him, or by military counsel appointed by the convening authority. The party is entitled to military counsel of his own selection, if reasonably available. Except in an investigation which is to be utilized as a pretrial investigation required by Article 32 of the Code, no special legal qualifications of counsel for the party are required. In a court of inquiry or other formal investigation,

counsel qualified under Article 27(b) of the Code should be made available, if practicable." "If the investigation is to be utilized as a pretrial investigation required by Article 32 of the Code, counsel for the party must be qualified within the meaning of Article 27(b) of the Code unless the party expressly waives the appointment of counsel so qualified. The explanation of this right in an appropriate case, and any waiver thereof, shall be reported verbatim in the record of any formal investigation. It is the duty of the counsel to represent the party to the best of his ability and to protect and safeguard the interests of the party by all honorable and legal means. If counsel for a party is absent, a formal investigation shall not proceed until his return, or until new counsel for the party is retained by him or appointed by the convening authority. However, the party may waive his right to have counsel present provided the party understands his right to counsel and the effect of the waiver. The explanation of this right and any waiver thereof shall be reported verbatim in the record." "Upon the designation of a person as a party during the course of the investigative proceedings his rights as such shall be explained clearly to him. The record of proceedings, to the point the investigation has progressed, will be made available to a newly designated party and his counsel for examination. Any reasonable request by a newly designated party for recall of witnesses previously examined for the purpose of cross-examination shall be granted. If the witness cannot be recalled, cross-examination may be accomplished by affidavit (see 0421) or in the case of an informal investigation by any practicable means. Any testimony given by a person as a witness prior to his designation as a party remains in the record after designation as a party." "Undue delay in the designation of a party may constitute prejudice and preclude adverse action with respect to the party based upon the record of his earlier testimony." "The record of proceedings of a court of inquiry or formal investigation shall set forth verbatim the advice given to a person designated as a party concerning his rights. Any waiver of his rights by the party, in whole or in part, shall also be recorded verbatim. Waivers may be made personally by the party or by counsel in the presence of the party." "A party to an investigation is not entitled to a copy of the record or investigative report, or any part thereof, unless the record is to be used as a pretrial investigation under Article 32 of the Code and trial of the party by general court-martial has been ordered." That concludes a reading of the rights of a party as they pertain to you in this case.

COUNSEL: Do you fully understand all of your rights and do you have any question concerning them?

LCDR HECKER: I do understand them. I have no questions.

Lieutenant Commander Hecker requested and was granted a delay in the proceedings until he could obtain counsel and examine the record of proceedings to the point the inquiry had progressed.

The court adjourned at 1720 hours, 16 April 1963.

SIXTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Thursday, 18 April 1963

The court met at 1009 hours.

All persons connected with the court who were present when the court adjourned were again present in court, with the exception of (b) (6) who was relieved by (b) (6) as reporter.

Lieutenant Commander Stanley Hecker, U. S. Navy, a party, introduced Mr. Louis P. Gray, III, a member of the Bars of the State of Connecticut and District of Columbia as his counsel. Lieutenant Commander Hecker and his counsel waived their right to examine the appointing order and any amendments thereto. The party and his counsel stated they had no objection to any member of the court.

COUNSEL FOR THE COURT: Will you state whether you have had a full and complete opportunity to examine the record of proceedings of this court up to this point and, if you deem it advisable, we will adjourn the court to accord you this opportunity.

MR. GRAY: Mr. President, as this court of inquiry knows, I arrived here late yesterday evening and immediately undertook to review the record of proceedings and the exhibits thereto. I feel that this court has given me, up to this point and time, every available opportunity that any attorney could hope to ask for. Furthermore, the president of this court has given me his assurance that I will have whatever time I need to make that full and complete examination and report to this court when I am ready to proceed. I would like to state at this time, Mr. President, that Lieutenant Commander Hecker and I do have some more work to do in connection with our review of the record and that we are willing and do hereby waive at this time our right to be present before this court of inquiry, should the court of inquiry desire to proceed with witnesses in the technological as distinguished from the operational area affecting Lieutenant Commander Hecker.

COUNSEL FOR THE COURT: Commander Hecker, do you state that the request for waiver in the terms voiced by your counsel is made by your express authority and consent and that you join in them?

LCDR HECKER: Yes, sir, I do.

PRESIDENT: I would like at this time to express the appreciation of the court to Lieutenant Commander Hecker and his counsel for appreciating and taking such a public-spirited attitude toward his own part in the proceedings. If we were to be delayed at this time, it would lessen the opportunity of this court to contribute to the future safety of operations of submarines to the maximum extent possible. The longer we delay, the more the trail grows cold, the less likely we are to be able to make meaningful contributions to the improvement of the art of submarine design, manufacture, and operation. So your public-spirited attitude is noted and commended by this court.

MR. GRAY: Thank you, Admiral.

LCDR HECKER: Thank you, sir.

COUNSEL FOR THE COURT: Does the party desire further examination of any witnesses already before this court or to call other witnesses at this time?

MR. GRAY: Mr. President, gentlemen of the court, Lieutenant Commander Hecker and I have not at this point and time arrived at any determination regarding cross-examination of witnesses previously called before this court or our desires to call additional witnesses. When we have arrived at that determination we will so inform the court.

COUNSEL FOR THE COURT: Does party or counsel have anything further to add at this time?

MR. GRAY: We have nothing further to state, Mr. President.

Lieutenant Commander Hecker, party, and his counsel, Mr. Gray, then withdrew from the courtroom.

At this point in the proceedings RADM Charles J. Palmer, U. S. Navy, entered the courtroom, asked for and was granted permission to address the court, and stated as follows:

RADM PALMER: Mr. President, for the record, first of all I am Rear Admiral Charles J. Palmer, Commander of the Portsmouth Naval Shipyard. It is my understanding that provision is made for according the rights of a party to anyone who, because of his position, has an interest in the subject matter under inquiry. This provision is, I understand, quite separate and apart from the mandatory requirement that the court designate as an interested party one who appears to the court, on the basis of the evidence received, to have become directly involved in the subject under inquiry. It seems to me quite clear that as Commander of the Portsmouth Naval Shipyard, I do have a proper and official interest in so much of the inquiry as relates to the Shipyard, and because of this interest I desire to avail myself of the permissive provision I have mentioned previously and I respectfully request the court accord me the rights of a party. And should the court grant this request, I designate Captain Dana P. French, U. S. Navy, who is now present in court, as my counsel, and I request that he be allowed to be present during the reception of evidence.

PRESIDENT: Admiral, do you wish to state the nature of your interest any further than in your statement?

RADM PALMER: Simply because of my position as Commander of the Shipyard, Mr. President.

PRESIDENT: If there be no objection, the court designates Rear Admiral Charles J. Palmer an interested party before this court in order to accord him the rights of such a party in these proceedings.

COUNSEL FOR THE COURT: Admiral Palmer, is your counsel a lawyer and a law specialist officer of the Navy, designated in accordance with Article 27 of the Uniform Code of Military Justice?

RADM PALMER: Yes, he is.

COUNSEL FOR THE COURT: I show to the party and his counsel the appointing order of the court of inquiry and modification thereto for their examination.

CAPT FRENCH: Mr. President, we waive the examination of the precept.

PRESIDENT: Very well.

COUNSEL FOR THE COURT: Do you object to, or challenge any member of this court of inquiry?

RADM PALMER: I do not.

COUNSEL FOR THE COURT: At this point I shall advise the party of the prescribed rights of a party. The party to an investigation by a fact-finding body shall have the following rights: To be given due notice of such designation; to be present during the proceedings, but not when the investigation is cleared for deliberations; to be represented by counsel; to cross-examine witnesses; to introduce evidence; to testify as a witness; to refuse to incriminate himself; and to refuse to make any statements regarding any offense of which he is accused or suspected. To make a voluntary statement, oral or written, to be included in the record of proceedings or investigative report; to make an argument at the conclusion of presentation of evidence.

In courts of inquiry only, the party has two additional rights: To challenge members of the court of inquiry for cause stated to the court; if charged with an offense, to be a witness at his own request and not to be called as a witness in the absence of his own request.

Admiral Palmer, do you understand your rights as a party?

RADM PALMER: I clearly understand my rights as a party.

CAPT FRENCH: Mr. President, may the record show the manner in which Admiral Palmer desires to exercise these rights. He does desire to avail himself of his rights but in the manner following: Admiral Palmer waives his right to a reading of the record of proceedings at this time in order that the court may get on with its work. He does, however, reserve his right to read the record at his leisure. Admiral Palmer waives his right to cross-examination or recall of any witnesses heretofore called at this time, and would like to reserve his right later to recall if such right becomes necessary. Admiral Palmer waives his right to be personally present during all sessions of this court during the reception of testimony but does reserve his right to be present during the testimony of such witnesses as he determines. He does, however, request that his counsel be present at all sessions during which evidence is being received, and his right to exercise all other rights, he respectfully reserves.

COUNSEL FOR THE COURT: Admiral Palmer, you have heard the waivers of rights of a party enumerated by your counsel. Are these waivers made by your express authority and direction and do you join in them?

RADM PALMER: I do.

PRESIDENT: I wish, in behalf of the court, to commend Admiral Palmer and his counsel for their understanding of the nature of the task of this court and their public-spirited attitude toward Admiral Palmer's rights in order to enable us to proceed in an expeditious manner.

RADM PALMER: May I be excused, sir?

Rear Admiral Palmer then withdrew from the room, his counsel remaining.

Raymond A. McCoole, Lieutenant, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, informed of the subject matter of the inquiry and examined as follows:

The witness was warned not to testify concerning classified matters.

DIRECT EXAMINATION

Questions by Counsel for the court:

Q. State your name, rank, organization and present duty station.
A. Raymond Arthur McCoole, Lieutenant, U. S. Navy, USS DOGFISH temporary duty, formerly of USS THRESHER.

Q. And when did you last serve on board the THRESHER?
A. I left THRESHER approximately 1800, the 8th of April.

Q. Would you, for the record, give us the spelling of your last name?
A. M-c-C-O-O-L-E.

Q. Give the court a description of your background and experience in the naval profession.
A. I joined the Navy as an enlisted man in 1946--November 13th--went through the normal enlisted submarine school, served aboard the USS CONGER from 1947 until 1949. I was transferred from the CONGER and spent a short time in the 16th Fleet, the reserve fleet. I then was transferred to Portsmouth, New Hampshire, to USS GUDGEON as pre-commissioning detail. I commissioned that ship in 1952, in November, I believe it was. I served approximately two years aboard the GUDGEON, then was transferred to Interior Communications Class "B" School in Washington, D.C., where I spent approximately a year. I was then transferred to nuclear power training at West Milton, New York. There I spent approximately two years. In 1956, in September I believe the month was, I reported to the USS NAUTILUS. I served aboard NAUTILUS until I was commissioned in 1958, transferred from that ship in August of 1958 to OCS in Newport.

Q. "OCS" means what, for the record?
A. Officer's Candidate School, the LDO portion of the Officer's Candidate School.

Q. If you will refrain from using abbreviations which are not universally understood, it will help clarify the record.
A. I am sorry. That is Limited Duty Officer portion of Officer's Candidate School. I was then transferred to Nuclear Power Training Unit, Idaho Falls, Idaho, for duty as assistant training officer and engineering duty officer aboard the F1W prototype.

Q. That was a prototype nuclear power plant, was it?
A. Yes, sir. I transferred from Nuclear Power Training Unit, Idaho Falls, Idaho, in July, 1962, to report to THRESHER, August 14, 1962.

Q. Lieutenant McCoole, while you were serving in the Nuclear Power Training Unit, did you become qualified as engineering officer of the watch?
A. Yes, sir.

Q. When you reported for duty on board THRESHER, where was she?

A. She was at Berth 11C, Portsmouth Naval Shipyard, making preparations to enter Drydock Number 2 at Portsmouth.

Q. Now, Lieutenant McCoole, your testimony is going to be a very valuable source of information to this court which should help us to learn and to see through your eyes, what was going on in THRESHER, what work was in progress, the nature and extent of the repairs and overhaul, the personality of the commanding officer, other officers, and the feeling of the crew with regard to the post shakedown availability and all of the events leading up to the day of her putting to sea. Therefore, in the questions which I am about to put to you, make every effort to answer them fully and completely and accurately and to attempt to distinguish between those things of which you are absolutely sure and those things which are your very best recollection of an impression, and distinguish them for us. Tell us which they are so we will be better able to evaluate the information you give us. Now you reported on board THRESHER in August, 1962?
A. Yes, sir.

Q. It was making preparations to go into drydock. Please tell us what your reaction was when you first boarded her in reporting for duty?
A. I reported to THRESHER. My first assignment was to train myself in the operation of the nuclear propulsion plant. During this time, I got acquainted with the crew, not to the degree that I would have liked to have known them; it is difficult in a shipyard and in drydock to meet everyone and know their capacities. I believe I spent the first six weeks studying the ship training manuals and at this time the equipment in the ship, the majority of it was removed, so tracing the piping system and checking out the operation of components was impossible. There wasn't anything operational at this time.

Q. The status of the ship was that it was in the middle of an availability preparing for drydock when you first reported aboard?
A. Yes, sir.

Q. Were you living on board at that time?
A. No, sir, we were not; we were living aboard a living barge.

Q. Did you spend much of these initial days and weeks on board the ship or were you in the barge?
A. On the initial few weeks I spent the majority of my time on the barge.

Q. At that time you were studying the books?
A. Yes, sir.

Q. Is that it?
A. Yes, sir.

Q. Were you at that time familiar with the reactor plant in THRESHER?
A. The theory and basic principle of operation, yes, sir; the piping and nuts and bolts, I was not familiar with.

Q. Now, in my asking these questions in sequence, McCoole, I will be doing my best to draw information from you, but if you feel there should be information inserted which is not called for by my question, feel free to volunteer it.
A. Yes, sir.

Q. I urge you to do so. About how long did you spend in studying the books?

A. Well we never get away from studying the books, sir. I was still studying when I left THRESHER, to assume other duties, and the training then, after the first few weeks in the books, the training would be then in tracing out systems, looking at components and a little less time spent on the books.

Q. Would you say that that initial period of familiarization, which you have described, took four weeks or more?
A. To the best of my recollection, the first three weeks I spent reading the reactor plant manual. From that time on, it was to read the manual and go look at the components in the ship.

Q. Had you been notified as to what billet would be assigned to you in the ship?
A. Yes, sir. I was to relieve the electrical officer of his duties and I did this in October. I can't recall the exact date.

Q. What is his name?
A. His name was Lieutenant (jg) (b) (6)

Q. Now the division which you headed up then, the electrical division, was referred to in common naval parlance as the "E" Division?
A. Yes, sir.

Q. And you became the "E" Division Officer?
A. Yes, sir.

Q. As a new "E" Division officer, you must have formed an initial impression of the men in your division, their competence, their spirit, and their general all-around outlook. Looking back now, not to your present impression of those men which may or may not be different, but looking back to that period in the life of the ship, tell us what your impressions were of the men of your division.
A. I felt that I was taking over a division that was extremely competent. The organization was well formed. The division had a leading petty officer who was an E8 electrician chief, and each one of the individual groups within the division; that is, the reactor control group, the electrical group and the interior communications group, each had a chief petty officer in charge.

Q. Did the division require a high or a low level of effort on your part for it to conduct its business?
A. The division actually ran itself. There was almost no need for me to be there. They were extremely competent with a very capable LPO.

Q. LPO means what?
A. Leading petty officer.

Q. Who was that?
A. Chief John D. Shafer.

Q. That is Shafer?
A. Yes, sir.

Q. How do you spell that?
A. S-H-A-F-E-R.

Q. Were there other petty officers who made the division--I believe you said run itself?

A. Yes, sir. The chief petty officers that reported directly to Chief Shafer were Chief Hewitt in charge of the electrical group who was extremely competent, a very bright, conscientious chief petty officer; Chief Pennington was in charge of the Reactor Control Group. Chief Pennington was an ex-steward who had converted to EM and made chief. He had over 20 years' service.

Q. Converted to electrician's mate rating, is that what you are saying?
A. Yes, sir. He was an excellent leader. The personnel in his group were highly trained, very skillful technicians. Chief Pennington was not a technician, though the people in his group were, and they had more training than he and perhaps more experience. However, because of his fine leadership he had a well organized group of men. They enjoyed working for him and he enjoyed having them. I think the relationship there was outstanding.

The third group, the Interior Communications Group, was led by Chief Peters, an E8 electrician's mate chief, who was new to submarines. He was well liked by everyone in the division, and though he was continually learning and didn't know all the answers to interior communication problems, he had a well trained group of men that did have the answers for him and their relationships were very good.

Q. At that time there was work to be done in the "E" division, was there not?
A. Yes, sir. In the beginning there was work, a lot of work, to be done.

Q. What was your impression to the approach to that work, the plan of approach which was already in progress?
A. The planning had apparently been very, very well set up, the entire plan of attack there for squaring away the electrical problems on the ship. It was set up so well that, as a matter of fact, the electrical work that was to be accomplished during the PSA--the post shakedown availability--was accomplished well ahead of the work of the rest of the ship.

Q. We shall go into the details of that work a little later in your testimony. I would like now, though, to find out whether everything in your division that was done, was done as planned?
A. Yes, sir.

Q. All right. Did any failures crop up?
A. We had minor failures crop up that the "E" division appeared to take for granted as though they planned on unforeseen failures to occur. I can give you an instance if you would like.

Q. Yes.
A. The b(3) 10 USC 130 --I am sorry, that was b(3) 10 USC 130 The initial test of this unit after a modification was performed on the lube oil system, the initial run, caused this machine to wipe so that the bearings had to be replaced. With the aid of the Shipyard we had no problems whatsoever. The bearings were replaced and it did not alter our schedule at all.

Q. Now you have described to us some of the leading petty officers of your division. Did you have any low rated or non-rated men in your division?
A. We had low rated; we did not have any non-rated men in the division. Our lowest rated man was a third class and he made Second Class Petty Officer almost immediately after he came aboard, as I recall.

Q. And as to your second class petty officers?

A. We had a number of second class petty officers in the "E" Division. I believe about one-third of the division were second class.

Q. Would you say then that you had enough men to do the job assigned?
A. Yes, sir.

Q. In your view, were they of proper qualifications and experience to do the job?
A. When I reported to THRESHER and shortly thereafter the number of experienced personnel in the "E" division was very high. This number dwindled. However, the number of experienced personnel in the Division when THRESHER got underway was certainly adequate.

Q. Were you satisfied with it?
A. Yes, sir, very satisfied.

Q. Would you say you had an unhappy division, an average division or one with higher morale and outlook than average?
A. I would say I definitely had a higher-than-average morale in the division. I've been with many electrical divisions and I don't feel that I've ever seen a happier group of men.

Q. Now what impressions were you forming of the rest of the personnel in THRESHER at that time. For example, what was your assessment of the commanding officer?
A. I had served with the commanding officer prior to his taking command of THRESHER. He was aboard NAUTILUS as the Reactor Control Division Officer.

Q. You are referring to whom now?
A. I am referring to Captain Harvey.

Q. Go on.
A. Did you want me to go on?

Q. Yes, I did.
A. My impression then on NAUTILUS was that Captain Harvey was a very brilliant, extremely competent naval officer, and my opinion didn't change when he came aboard THRESHER. Captain Axene--I had never served with him aboard a ship at sea. My impression was that he was probably the most polished naval officer that I have ever seen in my life and it was apparent that he had everything aboard the ship well within his control. The crew felt that there was only one commanding officer in the world and that was Captain Axene.

Q. That was while he was on board?
A. Yes, sir.

Q. Go on.
A. I don't believe the crew had time enough to evaluate or form an opinion of Captain Harvey. I feel certain the wardroom did and the officers were impressed with his ability to get things done, things that we had been trying to get done here in the Shipyard--perhaps minor items--however, they were always accomplished as soon as he heard about them.

Q. Was it your evaluation that he knew his ship well and understood it thoroughly?
A. Yes, sir.

Q. All in all, what did the crew think of the ship?
A. The experienced men on THRESHER felt that the ship could go through anything and come out of it in good shape. I believe the men that served aboard during her initial sea trials and the shock trials felt that it was undoubtedly America's finest submarine.

Q. Was this feeling infectious to the newer men?
A. Yes, sir. The newer men, of course, were young and the feeling of security aboard such a submarine would only come from the older men aboard, the more experienced men, and my impression was that they--as long as THRESHER would have been around--this feeling would have persisted.

Q. Using as a reference the time early in April, the ninth of April to be precise, what proportion of the crew were new men who had reported aboard during the period of post shakedown availability?
A. I would have to guess at that figure, sir. I believe approximately 30 per cent were new people.

Q. How would you regard that percentage--healthy or unhealthy?
A. I would imagine, sir, that it was probably average for any ship spending this amount of time in the Shipyard.

Q. You have told us that the "E" division had a firm grip on its work and was able to accomplish it. Now looking out from your division at the other divisions on the Ship, were you able to note what they were doing during your time on board?
A. Yes, sir. The "M" Division, the mechanical division--that is personnel working in the engine room--were working long hours; I believe they were working 12 hours on and 12 hours off during the last few weeks of the availability. However, this didn't seem to change their feelings at all about the ship. Most of the ship was willing to work the longer hours in order to end the availability and get back to sea, and in most cases get back to their families who had been moved to Connecticut, and in the last few weeks, as in most overhauls, weekend liberties are far and few between.

Q. Were the men in the "M" Division complaining about this?
A. No, sir. They were still a very happy group. As a matter of fact, we commented a number of times no one could see why these guys kept smiling, and they did. Things were still looking good to them regardless of how many hours they were putting in.

Q. Who was immediately supervising their work at that time?
A. Chief Petty Officer--Chief Engineman named Wise.

Q. He was their leading Chief?
A. He was their leading Chief, and recently assigned the duty as Main Propulsion Assistant, directly responsible to the Chief Engineer. The Propulsion Assistant had changed jobs. That was Lieutenant Commander (b) (6)

Q. What sort of a job was the Chief doing in Main Propulsion?
A. My impression was that he was doing an excellent job.

Q. Can you tell us about any other divisions on the ship?
A. Yes, sir. It had a division auxiliary officer in which Lieutenant John Smarz was in charge.

Q. S-m-a-r-z?

A. Yes, sir. They were undoubtedly the hardest working division aboard. I believe this is the case on most submarines. It would seem at times that this small group of men were working around the clock, though I'm sure they were sleeping or getting some sleep. They did have the greatest number of problems and the systems that they were caring for were the most troublesome on the ship.

Q. Now with regard to the attitudes of the men towards their officers, this question will relate to whether or not the men had confidence in the officers who were directing them. You were peculiarly advantaged by an insight, in that you had had previous enlisted experience to know that sometimes men have views about the officers that are not transmitted to the top.

A. Yes, sir.

Q. Do you feel that you got a feeling for how that group felt about the officers?

A. Yes, sir. The entire crew felt that the chief engineer and the "A" Division Officer and Lieutenant Commander (b) (6) , who were the experienced officers on THRESHER, were extremely competent and the Engineering Division had every bit of confidence possible in these officers. The other officers aboard were relatively new. I believe that the confidence the men had in Captain Axene would probably never be the same with anyone else. However, I am sure that they would have had a lot of confidence in Captain Harvey.

Q. I bring your recollection up to the point when you went into power operations to test out the reactor plant. About what date was that?

A. We brought the reactor to--about the 15th of March, the reactor was brought critical for the first time during the availability. This was for power operations, a check-out of the reactor and the engine room.

Q. And did you continue to live on the barge?

A. Yes, sir. We lived on the barge so all of our working hours were spent on the ship.

Q. I want simply to remind you, in the questions which I ask, to continue to remember that no classified information should be divulged. What major jobs were completed at this time?

A. All of the engineroom work including the main turbines, the main condensers, the auxiliary circulating water systems, main circulating water systems, all reactor plant was completed. The work still to be completed was in the areas of hydraulic system, electrical wiring of the ship's control panel and work in the forward part of the ship was not at that time completed.

(b) (6) relieved (b) (6) as reporter at this point.

Q. Did any work remain at the present time in the steam plant?
A. No, sir, however, during our steam operations we did have a minor difficulty in which we shut down for repair, and went critical again the same day.

Q. Was there any significant problem found to exist when the plant went critical?
A. No, sir, the most significant was in the area of control of our boiler. water levels.

Q. What was the nature of the difficulty with respect to that?
A. We had an oscillation b(3) 10 USC 130

Q. Will you describe its magnitude?
A. Yes, it was small oscillation, approximately b(3) 10 USC 130

Q. Was that difficulty fully corrected?
A. No, sir.

Q. To get some feeling for the nature of this, could this fluctuation have contributed to the loss of reactor power?
A. No, sir.

Q. Did you find out whether this was a new idiosyncrasy or had it been discovered in the past?
A. It had been discovered in the past. The ship made numerous attempts at aligning the control units to minimize this boiler level fluctuation.

Q. What I would like to know, and I don't have your engineering background, was this a big thing, a small thing, or what?
A. It was an interesting engineering problem, sir. I'm not sure how difficult it would be to correct; I don't believe it has been corrected any place. I don't think the THRESHER is the only ship experiencing this problem.

Q. Does it affect safety?
A. No, sir, it does not.

Q. How would you describe it?
A. I would describe it as an interesting engineering problem.

Q. Of interest to an engineer but not to a passenger?
A. That's right. It wasn't supposed to do this and we couldn't know why it did it. It would not in any way hamper our operations. It was a problem that was there.

Q. Now, then, what would your overall evaluation be of the power plant checks that you made at that time, under power operations?
A. The power plant check at that time was completely satisfactory, normal. At this time I was going through my technical phase of qualification. My job was in the maneuvering room, the control station for the engineering plant. I was receiving the practical training required for engineering officer of the watch qualification on board. I was impressed by the training of the crew. They had been away from the operation for the majority of these components for I believe eight or nine months, and yet they functioned almost like clockwork.

Q. Were there any new men there who fitted into the team at that time?
Q. Yes, sir; however, most of the new men were in the same category I was in, and they were being supervised by the older, experienced men.

Q. After the plant went critical, you had the power plant check under power operations; what was the next phase of work during this availability period?
A. The engineering plant went into a weep correction phase.

Q. Will you explain that phase for us?
A. During the operation of the steam plant, work items were uncovered and reported to the Shipyard and when the plant was shut down they would come in and accomplish the work necessary.

Q. Bearing in mind, Lieutenant McCoole, that although we want to know everything, we want to know whether you are referring to major or minor work items. What would you say was the nature of the correction period which followed the reactor test?
A. As I recall, the items uncovered during this testing period were all minor; there were no major work items that I can recall. Some period of days after our operations we did have a casualty involving b(3) 10 USC 130 pump. A bearing had seized and we had to replace that pump.

Q. Was it replaced satisfactorily?
A. Yes, sir.

Q. What work was progressing on the remainder of the ship at this time?
A. The hydraulic systems again were approaching their completion. The wiring in the midship compartment was completed and we were going through a phase of individual component checkouts in the forward part of the ship.

Q. Was any work being done on the air system at that time?
A. Yes, sir, the air systems, as I recollect, were a continuing problem. Prior to our power operations-- during and after our power operations, we had difficulty with the air system. The (b) (1) (A) --I'm not sure if these figures are classified or not.

Q. Don't mention any figures. We can take this part of your testimony later.

By the President: The court is knowledgeable of the pressures on the ship. If you will just refer to them generally, that will be sufficient.

Q. Then, do you feel that you can give us a fair picture without referring to pressures?
A. Yes, sir.

Q. Then, please do.
A. The reducers in the air system, the high pressure and the ship's service system were not functioning properly. These reducers were replaced numerous times. I don't recall how many times. It would seem that every time a workday would end one more reducer would have been replaced. Also, prior to the replacing of all these reducers, the air system had been flushed and cleaned. However, we were still clogging the strainers in the system, affecting the flow of air to the reducers.

Q. What was thought to be the trouble?
A. The trouble with the high pressure air reducer was a problem in the poppet valve, allowing air to flow continuously, and the ship's service air system, the reducer in this case, was not reducing air; it was open and would allow a high pressure to go by and would release the higher air pressure via the release valve.

Q. Did you find out what was clogging the air filters?
A. We felt at that time that the system had not been adequately cleaned prior to putting it in operation.

Q. Then was the system water flushed and cleaned?
A. Yes, sir.

Q. And after that did the filters continue to clog up or not?
A. I don't recall any problems with filters after that. Then the problem of reducers became apparent.

Q. Now, in addition to this continuing work which was progressing on the air system, was there at the same time work being done on the hydraulic system?
A. Yes, sir.

Q. Describe it, please.
A. Individual components of the hydraulic system at this time were being checked out. We found that at least twenty percent of them, all hydraulic valves, were operating backwards; that is they were closing when the switch was placed in the open position, instead of vice versa. Also, we had numerous hydraulic leaks.

Q. With regard to the difficulty with the valves, were steps taken to correct them?
A. Yes, sir, all valves were corrected. Valves were corrected in their proper operation and turned so that each valve operated at its correct response.

Q. Was this electrical or mechanical trouble that you had?
A. This was mechanical in almost all cases.

Q. Does that mean that it required repiping?
A. In some cases it required repiping and in other cases they could lift the pipes and use the same piping, and connect the valving properly.

Q. Would it require flushing and retesting in each case?
A. I'm not sure, sir; reflushing is necessary for these connections. I don't recall whether they were or whether they were not.

Q. Did the hydraulic system have a final test when this work was completed?
A. Yes, sir; all valves, all hydraulic components were checked for proper operation and proper timing just prior to the fast cruise.

Q. Just prior to the first fast cruise?
A. Yes, sir.

Q. You say they were rechecked. I would like to know the results. Were they working; did they pass that check, their test?
A. To the best of my knowledge, the system checked out satisfactorily. The only other problem that I can remember in hydraulics is on the 8th of April, the day I left the ship, I left about eleven o'clock. I noted they were carrying some servo dials from the ship, servo mechanisms. Later that evening, when I came back to the ship, the engineer informed me that they had changed some servo mechanisms in the rudder and sail planes.

Q. Did he tell you whether the changeover had been successfully completed?
A. He didn't say, sir. I believe I took it for granted that it was successful.

Q. What gave you that impression?
A. They were working the planes when I left the ship that night.

Q. I would now like to get back in point of time, back to the period immediately preceding the first fast cruise. Except for this additional incident with regard to the servo mechanisms, which occurred much later, there was nothing at that time to be done in the hydraulic system, is that correct?
A. To the best of my knowledge, that is correct.

Q. But in this period immediately preceding this first fast cruise, did the air system remain a continuing problem?
A. Yes, sir.

Q. And those were reducer problems?
A. Those were reducer problems.

Q. When did the first fast cruise occur?
A. We started the first fast cruise on 23 March, though the reactor plant was critical prior to that time in preparation for the fast cruise.

Q. Now the purpose of a fast cruise is what?
A. It serves, I believe, two purposes; in training the crew to take the ship to sea, and check the operation of the entire ship, all components of the ship.

Q. Tell us, in the greatest particularity that you can achieve, a complete description of that first fast cruise, from your eyes.
A. The engineering plant operated satisfactorily. The rest of the ship was discovering a perhaps greater-than-average number of work items.

Q. You say "greater than average"; are you comparing THRESHER with a ship of her exact type, or a simpler ship when you say that?
A. I'm not able to compare the number of THRESHER's deficiencies or work items; I've never been on an attack class submarine before, a nuclear attack class.

Q. But there were a number of minor deficiencies?
A. There were, and the Captain, who was experienced, felt that the number was great enough so that we should abort the fast cruise.

Q. Thank you, that does answer the question. But many things happened before that decision was made, did they not?
A. Yes, sir.

Q. Please go on with a description of the events conducted during the fast cruise and any other happenings which occurred during that time.
A. In the engineering plant we were conducting casualty drills for training; perhaps for my training rather than anyone's. Every one of the operations that were conducted were needed by me for my qualification. We had a b(3) 10 USC 130
SCRAM drill --

PRESIDENT: You're getting a little close, now, aren't you, Lieutenant McCoole, to classified matter?

WITNESS: I believe it would, sir, if we used any--

PRESIDENT: Yes,. We would like to hear the details of that casualty drill in closed court, but let's pass that by for the moment so that we won't have to close the court at this time, and go ahead with other casualty drills or other

details of the fast cruise that can be described without getting into the classified area.

Questions by counsel for the court continued:

Q. Would you say, just generally, that drills in the engineering spaces were successful or unsuccessful?
A. I would say they were successful.

Q. Now that's talking about the drills of one particular division. Were there any general ship's casualty drills?
A. There were a few, as I recall, and we discovered areas in which the ship needed more training; the areas of communications and the automatic response of individuals to a casualty. The drills held were not nearly the number we had hoped to hold, because most of the ship's force were either working on components, making them operational, or writing up work items.

Q. Well, how many hours, approximately, would you say, during those days on the first fast cruise, were spent on general drills and ship's casualty drills?
A. Drills that included the entire ship's force, as I recall, approximately six hours was spent on this type.

Q. Were there any other drills conducted that you can tell us about in open court?
A. Yes, sir, we had radiation drills, high air contamination; part of this drill, and I believe perhaps more time was spent on this drill than on any other, all personnel aboard were allowed to make their way about the ship from compartment to compartment and from one part of a compartment to other operating stations in the compartment, while they were masked with these air breathing masks. This is a fairly difficult evolution. We had fire drills, and loss of power drills; this was lost electrical power, and conducted drills involving quiet operation of the ship.

Q. Now you told us earlier that the commanding officer had come to the conclusion that he should stop any further conduct of that first fast cruise. Would you state the circumstances surrounding that decision and when the action was taken?
A. The Captain called all officers to the wardroom. We had anticipated his aborting the fast cruise due to the number of weeps. However, the engineer felt that he would like to continue.

Q. Excuse me, for the sake of clarity, would you define that phrase you used, two phrases, "aborting' and "weep"?
A. To abort the fast cruise, I mean to cease.

Q. Call it off?
A. Yes, sir. Weeps, I mean here that work items discovered, or deficiencies in any area at which the Shipyard has work, a slip of paper is submitted to the Shipyard outlining the deficiencies. The Shipyard,then, at a later date, comes aboard and repairs it, or corrects it.

Q. That can be either major or minor?
A. Yes, sir.

Q. When did the commanding officer call the officers together in the wardroom?
A. I believe it was the early morning of the 25th of March.

Q. You said the deficiencies could be either major or minor, and still give them the term that you used. Do you recall whether the deficiencies found, and which were the subject of the Commanding Officer's call to his officers, were the nature of the deficiencies major or minor?

A. The great majority of deficiencies were minor. They were painting deficiencies, floor covering deficiencies, this type of thing. The major work items that were uncovered were, again, the high pressure and ship's service air systems, and some that were on the border of being major in the hydraulic systems.

Q. Can you describe those particular weeps for us?

A. Yes, sir. The one that comes to my mind now is the periscope raising and lowering mechanism was backwards. The Shipyard later looked at this design and was to make up a work packet, forward it to New London and we would install it ourselves.

Q. Did that affect the ship's safety in any way?

A. No, sir.

Q. Can you think of any others, Lieutenant?

A. In the diving control, or the ship's control stand, there were a number of erroneous indicating units; sail and stern plane indicators, ship's angle indicators were erroneous. Again, I don't believe it would be considered as a major item. It was merely zeroing a synchro.

Q. Making a minor adjustment?

A. Yes, sir. As I recall it, the only major item was the air system.

Q. Was that something new, or was it the old?

A. It was the same thing that we had been experiencing in the past.

Q. But was there additional clogging of the strainers, or did that remain corrected?

A. No, sir, that did remain corrected. The problem at this time were the reducers.

Q. What about deficiencies in your own division? Were there any of significance?

A. No, sir, none that could be considered major. I did, however, have to jump out one battery cell.

Due to the hour, the court, at 1245 hours, 18 April 1963, recessed for lunch. The witness on the stand was warned not to discuss his testimony with anyone other than members of the court, counsel for the court, parties or their counsel.

The court met at 1405.

All persons connected with the court who were present when the court recessed were again present, with the exception of (b) (6) ;, who was relieved by (b) (6) as reporter.

COUNSEL FOR THE COURT: Let the record show that, upon designation of Rear Admiral Palmer as a party in accordance with his request, the convening authority was notified in accordance with Section 0208c of the Manual of the Judge Advocate General. The convening authority has directed the court to continue with its proceedings.

Lieutenant Raymond A. McCoole, U. S. Navy, was recalled as a witness for the court, was reminded that his oath previously taken was still binding, was cautioned relative to testifying as to classified matters in open session, and continued his testimony as follows:

DIRECT EXAMINATION (Continued)

Questions by counsel for the court:

Q. Lieutenant McCoole, in order to make abundantly clear the meaning of the phrase "fast cruise," would you agree that it is a series of drills at dockside normally conducted by the ship's crew while the ship is closed to the outside world?

A. That's correct, sir.

Q. In order to clarify the exact duration of the fast cruise, concerning which you have been testifying, please give your best recollection of the time and date when it started, and the aborted time and date when it was aborted by order of the Commanding Officer?

A. Fast cruise commenced on the 23rd of March at approximately 2200. The reactor was critical prior to this time. The engineering plant was at power. However, there was still Shipyard personnel on board until 2200. At 2200 the ship was sealed, with exceptions. We still had some engineering personnel aboard. The fast cruise was aborted on the 25th of March. I can't remember the exact time.

Q. Some time in the morning?

A. Some time in the early morning. It was approximately two and a half days of fast cruise.

Q. You stated that, in your agreement as to the definition of the phrase "fast cruise" that the ship was sealed off from the outside world. Who were the engineering personnel who were on board in addition to the ship's crew?

A. They were personnel that worked with the nuclear power group in the Shipyard. They were aboard to observe b(3) 10 USC 130

Q. Did they remain on board during the duration of the fast cruise?

A. No, sir. They remained aboard approximately eight hours, and then left.

Q. Focusing our attention on the meeting in the wardroom, relate the discussion that occurred at the time the Commanding Officer announced his decision.

A. We had expected the Commanding Officer to ask our opinion on whether or not fast cruise should be aborted. However, he did not do this. He informed us that we would secure fast cruising due to the excessive number of work items. The Engineer, Lieutenant Commander John Lyman, felt that the work items were of a minor nature and hoped that we could continue fast cruise.

Q. Did he state his reasons?

A. The engineer's reasons were that we had no major problems that the Shipyard would not-- or he felt that the Shipyard could correct all the major problems prior to going to sea if we continued the fast cruise. There were no items that were real time-consuming. So the Commanding Officer felt that there were so many, that they would not be completed prior to the ship's leaving Portsmouth.

Q. To clear up some confusion with regard to your statement that the fast cruise lasted two and a half days, was it not from some time on the 23rd to early on the morning of the 25th?

A. We brought the reactor plant critical at 0200 on the 22nd. We remained critical through the day of the 23rd. We went into fast cruise, I believe, about 2200 on the 23rd. It was Tuesday morning that fast cruise was aborted on the 26th.

Q. You are giving credit to the time the reactor plant was critical, are you?

PRESIDENT: No. He is correcting the termination date to be Tuesday, the 26th, rather than Monday, the 25th. That would make two and a half days, if it started at 2200 on the 25th. Is that what you wish to say?

THE WITNESS: Yes, sir, I'm sorry.

Questions by the counsel for the court:

Q. How long had the Commanding Officer planned for the duration of that fast cruise? That is, for how long a period did he plan that it continue?

A. We planned on a four-day fast cruise.

Q. But it was the Commanding Officer's very own decision then to abort it?

A. Yes, sir.

Q. Now, were there any major deficiencies found in your division only?

A. I had one battery cell that had limited the battery to a low capacity. We jumped this cell out with the concurrence of-- well, permission from the Captain. In one of the fast cruises, and I can't recall which, we had a deficiency on the after group main ballast tank, a solenoid valve.

Q. Were those deficiencies corrected?

A. Yes, sir.

Q. Do you regard either of those as major deficiencies?

A. No, sir. The solenoid could have been overridden readily. The valve was right near the switch.

Q. Were there any major dificiencies which were noted during that fast cruise which you could identify for us?

A. When you say "identify" sir?

Q. Describe for us. I'm sorry.

A. The major one, of course, that comes to mind is the high pressure air-reducing valves were continuously bleeding air into the compartment. That is, the poppet valve was not seating.

Q. Was that repaired by the Yard?

A. Yes, sir. The reducer was replaced again.

Q. Were all the deficiencies noted during that fast cruise corrected thereafter?

A. No, sir. All of the major dificiencies were corrected. There were some minor dificiencies that were not corrected and some minor deficiencies that the Shipyard had no responsibility for; that is, we were trying to get work done that the Shipyard was not responsible for.

Q. But nothing remained to be done-- of the things that remained to be done, did any of those affect the safety of the ship if she were to put out to sea?

A. No, sir.

Q. On the 29th of March did the Commanding Officer order another fast cruise?

A. Yes, sir. On the 29th of March again we brought the reactor to power and went into fast cruise on the 30th, I believe the date was, for a twenty-four hour fast cruise, which consisted mainly of a crew training period.

Q. Do you recall the nature of the drills conducted at that time?

A. Yes. We had completed all the casualty drills that we had outlined on the fast cruise agenda that we originally had intended completing during the first fast cruise. These items, as I recall, these drills that we conducted were fire, flooding in the engine room, loss of power, reactor SCRAM. We found that the personnel were-- well, needed more training in communications; that is, the sound-powered telephone communications.

Q. This was the period embracing the events of two fast cruises when the ship was coming to life after a period of Yard availability, when it had been worked on and dismantled in part, and new equipments added to it. Would you describe this as a period when the crew was training as a team?

A. Yes, sir.

Q. Did they work together as a team, except for these difficulties experienced with communications in the ship?

A. Yes, sir. I personally was very impressed. I felt that, because of this long period in the Shipyard, there would be an awful lot of confusion. There was not, as I recall, though the engineer wasn't completely satisfied. Perhaps due to my own ignorance, they appeared real well trained to me.

Q. What was the nature of his dissatisfaction?

A. I believe mostly in the amount of time involved to take the proper action for any one drill, and this was, I think, as I recall, in isolating the ASW system. It took something on the order of 20 minutes.

Q. Well, did they work on that?

A. We didn't conduct that same drill again, no, sir.

Q. Describe the communications difficulties which were experienced.

A. During these drills there are different phone circuits manned. The Ship's Service telephone service is manned by all compartments. The engineering phone circuits are manned by the engineering spaces. There was some confusion as to what space should be on which of the two circuits.

Q. Was this confusion which resulted in learning or which was left in confusion?

A. No, sir. This resulted in learning, and we did, after that, man the phones on all other drills, and the amount of time it took to get the phones manned lessened, as were the number of drills.

Q. And with regard to the feelings of the Engineering Officer which you described as being of less than full satisfaction with the time consumed in the ASW drill, did you form the impression that he considered it adequate if not full satisfaction?

A. No, sir, I can't answer that.

Q. Did you know him well?
A. Yes, sir.

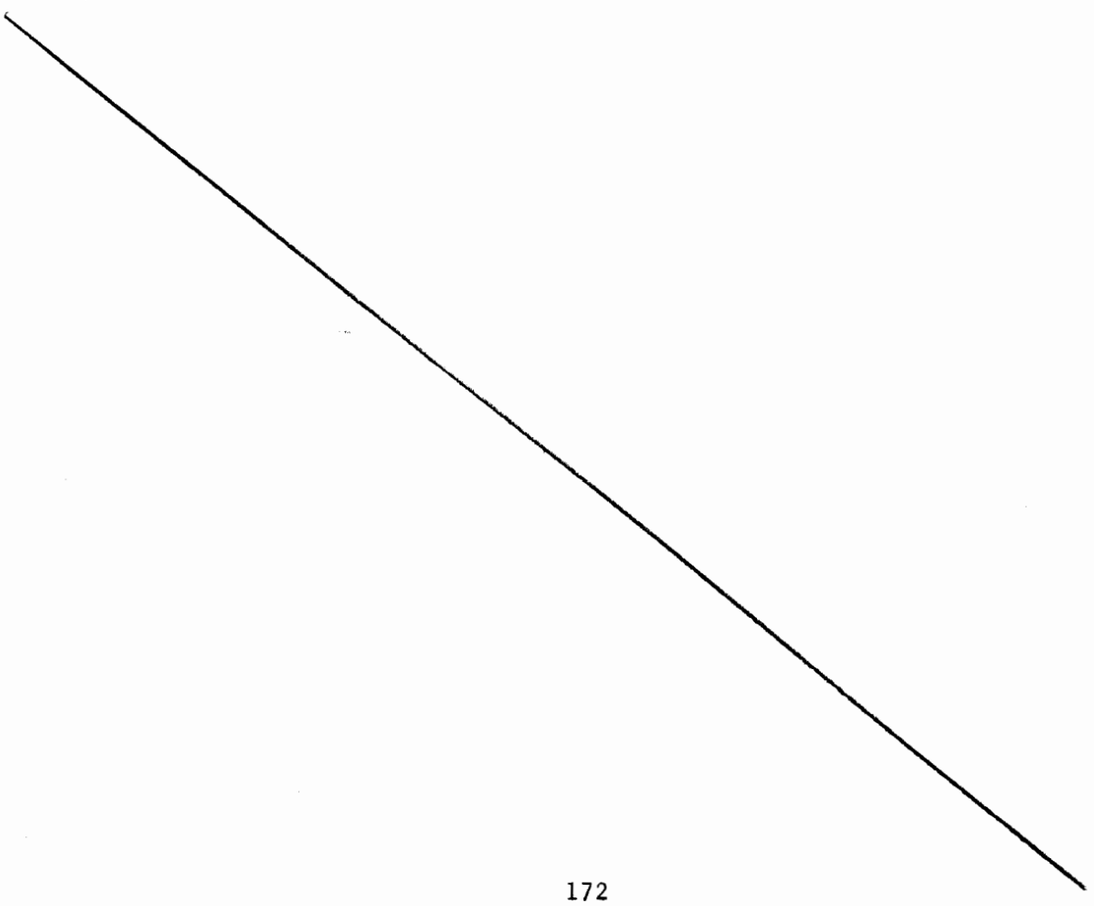
Q. Do you think he would have asked to run it again if he thought it needed running again?
A. Yes, sir.

Q. Now, is there more you can tell us about the events occurring in that fast cruise?
A. We held ship's drills where the crew was called to general quarters. We fired water slugs. That's all I can remember. I would say that we ran more than this. Yes, there was one more. We conducted a rod drop.

Q. Would you describe the scope of the drills conducted during the second fast cruise as minimal, moderate, fairly comprehensive, comprehensive?
A. I felt they were comprehensive. The agenda for fast cruise was reviewed by all of the officers aboard to determine if there was anything else that we might do to find any areas that perhaps the ship needed for qualification or re-qualification or training.

Q. During the first fast cruise, there was a period when you had workmen on board, in addition to the ship's crew?
A. Yes, sir.

Q. Did that same condition obtain during the fast cruise you are now describing?
A. I don't remember any workmen aboard during the second fast cruise.



Q. Did any deficiencies come to light as a result of the second fast cruise?
A. Yes, sir. As I recall, at the very end of the fast cruise, it was discovered that the starboard b(3) 10 USC 130 valve would not operate. I am not completely sure if this occurred during fast cruise, during the last hours, or right after fast cruise.

Q. It wouldn't open, or it would not close, which?
A. It would not close. It was open.

Q. Were there any other deficiencies of note?
A. Some difficulty was experienced in the starboard torpedo tube firing mechanism, or rejection mechanism. I am not at all familiar with the problem. We had a problem before that we knew about on the torpedo tube shutters.

Q. What happened after you completed your fast cruise then?
A. Due to the b(3) 10 USC 130 valve not operating, a decision was made between the Captain and the Shipyard whether to take the ship into drydock then and repair it or to go to the sound pier and run sound surveys. The ship was taken by tug over to, I believe it's Berth 6 - I'm not sure. After Drydock No. 2. Then a decision was reached to take us to the sound pier rather than put us in drydock. We went to the sound pier and ran sound tests, which, as I understand, were satisfactory.

Q. There had been a small amount of work to be done at that time?
A. Yes, sir.

Q. Did the crew get a period of liberty?
A. Yes, sir. All of the ship's company, with the exception of the duty section, went ashore. They reported back to the ship only when they had the duty.

Q. A relaxing few days?
A. Yes, sir, very relaxing; even for the duty section it was relaxing.

Q. Can you transmit to the court the feeling of the crew at this time with regard to the ship?
A. Yes, sir. They felt that they were finally going to get back to sea, get out of the Shipyard, after a few minor ends were taken care of. I feel they were looking forward to going down to Connecticut, naturally. All the families of the younger crew members were down there. The older people aboard had children in school and still lived up here. They were all looking forward to going to sea. We had spent a couple of days in drydock, and they hoped, by the 18th of the month, we would be on the way to Connecticut.

Q. I am trying to get an idea of whether the members of the crew felt there was a need for more work being done on the ship, or were they of the feeling that the ship was ready?
A. I feel certain that the crew felt that the ship was ready. I know that the Engineering Officer felt the ship was ready. The day before THRESHER got underway, the Engineer told me on our way home that night that he had never seen the ship looking so good or the "E" Division looking so good, and that the ship was ready to get underway.

Q. How long had he been on board?
A. He was on board--I don't know how long. He had been on board since commissioning.

Q. Since commissioning?
A. Since commissioning of the ship, yes, sir.

Q. What was your view along the same lines?
A. I felt as he did, sir.

Q. Now, were the Shipyard workers working on the b(3) 10 USC 130 valve to make it operable?
A. Yes, sir. They worked during sound trials and in between sound runs. They straightened the linkage with hydraulic jacks prior to leaving sound pier, so that the valve was operable. However, when we tested the system hydraulically, it would not hold water.

Q. What did they do about that?
A. Then we didn't do anything. We went into drydock, and the Shipyard replaced the mechanism on the valve and tested it, and it was completely satisfactory then, to the best of my knowledge.

Q. During the period that you were in drydock and before, was any work being done on those torpedo tube shutters?
A. Yes, sir. I'm not sure completely of the nature of the work, but the torpedo tube shutters were corrected in drydock.

Q. Now, you came out of drydock on the 8th of April, is that correct?
A. That's correct, sir.

Q. What time of day was that?
A. Somewhere around noon. I was not aboard. I left the ship about 1100. I reported back to the ship at 1600. She was then tied up at Berth 11(c).

Q. Was this the period of time which you earlier testified you saw servo mechanisms being brought on board?
A. Yes, sir. I left the ship. I was in a hurry, but I did see Yard workmen with servo mechanisms on their shoulders leaving the ship.

Q. Did you inquire about that upon your return?
A. Later that afternoon, when I returned, I asked the Engineer about it and was informed that they had changed the servo mechanisms for planes and rudders. I didn't ask then which planes they were, but I later learned they were fair-water planes and rudders.

Q. At this time what ship's equipment was out of commission?
A. The only thing that I can recall as being out of commission - and I'm not sure of this - because they may have worked on it in my absence - was a trim system priming pump. This was removed by the Shipyard early in the availability. It had a frozen shaft. It wouldn't turn. They repaired it and reinstalled it. I don't remember the dates. However, at the end of the period it had seized once again. I recall this. We had checked out the motor, and the motor was good. The problem was in the pump. This became a mechanical problem not related to the "E" Division.

Q. Was this a major or a minor problem?
A. This was a minor problem.

Q. Was there any restriction placed on the operation of any of the ship's equipment in the up-coming sea trials?
A. Yes, sir. It was planned not to fire torpedoes from the starboard tube nest.

Q. Were there any torpedoes on board at this time?
A. We had dummy torpedoes aboard that we fire during-- I don't recall, sir. I believe there was.

Q. Dummy torpedoes?
A. I believe there was one dummy. Most of the torpedo room was being equipped with make-shift bunks for personnel that were riding with us from the Shipyard. The torpedo room was virtually empty of torpedoes.

Q. Was there any explosive armament on board?
A. Not to my knowledge, no, sir.

Q. Well, what was the feeling in the wardroom at this point?
A. The general feeling when I returned to the ship Monday evening on the 8th of April was that the ship was ready to go to sea, and everyone there was looking forward to getting underway.

Q. There was nothing of major significance that was worrying anyone?
A. I don't believe there was anything that was worrying any of the officers. I drove the Engineering Officer home that evening about 1800, and he voiced his concern about the b(3) 10 USC 130 valve that we discussed earlier. The hydraulic operating mechanism for the valve would, in his words, jump when we operated the valve. I'm certain, knowing John Lyman, I'm certain that he wasn't concerned about this valve as a possible hazard or that it would in any way be dangerous. If he felt that way, I'm sure he wouldn't be talking to me about it. He would have been in the Shipyard talking about it. But he spoke about it just as an interesting engineering problem when he commented to me that the ship was well ready to go to sea, and he had never seen the electrical equipment aboard looking so well.

Q. Can you tell us the reason why you did not then go out with your ship on the following day?
(b) (6)

At about 1600 I came back to the ship, and we at that time were going over the sea trial agenda to see if we had missed anything. I was then informed by the Engineer that the Executive Officer would like to see me and that he felt that I should stay with my family during the period while her eyes were bandaged. I went to see the Executive Officer, and he had a set of leave papers made out for me for two days, and he told me to go home.
(b) (6)

COUNSEL FOR THE COURT: I have no further questions at this point, sir.

EXAMINATION BY THE COURT

Questions by a court member, CAPT. NASH:

Q. Up until this time I've had the feeling that there was a big rush to get this ship to sea in the last few days. Would you state your impression again?
A. Yes, sir. The crew and the officers were anxious to get to sea. However, the Shipyard and the Captain would not allow the ship to get underway as long as there were any major deficiencies, whether it was a safety item or not.

Q. Do you feel that the officers and crew were tired before they started this trip - abnormally so?

A. I would say that the period prior to fast cruise, during fast cruise, the crew was very tired. I would say, however, that during the sound testing of the vessel, they had rested up.

Q. So at the time the ship left, people had had opportunity to have their normal amount of rest?

A. I would say that is correct, sir. The policy in the Engineering Department was that we would make the reactor critical at least four hours prior to getting underway. Normally the Engineering Officer of the Watch and the personnel that were scheduled to make the plant critical would come in six hours early. This would leave them without any sleep the night prior to getting underway. The ship's policy was that this group of people would take the plant critical, get it on the line and then go to bed at 8:00 o'clock, or whatever time it was the ship left, and the other sections would then take over.

Questions by a court member, CAPT. HUSHING:

Q. I believe you mentioned that the periscope controls were installed backward, did you not?

A. Yes, sir.

Q. Did you mean by that, that the mechanical portion was installed backwards or that it was so installed that the controls operated in the opposite direction to what one normally would expect for the up and down directions?

A. Yes, sir, the latter is correct.

Q. That it was a design change to be made rather than a mechanical change?

A. That's correct, sir. And design personnel came down there, looked it over, and stated that they would make a design change and send a package to THRESHER when she reached New London.

Q. But the periscope did go up and down all right?

A. Yes, sir.

Q. You mentioned, I believe, that during a large portion of the post shakedown availability you were training yourself and qualifying yourself on the ship.

A. On the Engineering plant, yes, sir.

Q. Was other training being conducted on the ship during the post shakedown availability?

A. Yes, sir. There was a very substantial training program. Weekly examinations were given to the ship's company, where each Wednesday everyone aboard would be examined on a system or a number of chapters from the training manuals.

Q. So that during the nine-month period the crew, so to speak, was continually in a position of being trained with regard to your ship's systems?

A. Yes, sir. However, more from the manuals than being capable of operating the equipment.

Q. Do you think that this might have accounted in part for the return of the crew's reflexes in the early operations just prior to the end of the fast cruise?

A. I would say that probably is correct, sir. I was very impressed with the state of training of the crew. The Engineer's standards were apparently well above mine.

Q. Did you feel that there were any areas of training which did not receive sufficient emphasis during this time?
A. I don't feel -- I feel at the time that the training we had in the last day of the fast cruise was well worthwhile. I felt that we could have used another day or so, perhaps another two days. This would be in the over-all ship or the evolutions involving the entire crew.

Q. I believe you mentioned that the ship's force had a certain amount of work to do, did you not?
A. Yes, sir.

Q. And that the Shipyard had certain items of work to perform, is that correct?
A. Yes, sir.

Q. Were you aware of a system within the Shipyard by which the responsibility for this work was defined and system responsibilities were made known to the ship?
A. No, sir.

Q. Did you have any feel for which group, the ship or the Shipyard, was responsible for assembly of the auxiliary salt water system?
A. Well, a part of the system would be the responsibility, of course, of-- you mean the work on the system or the design?

Q. The work on the system?
A. The piping would be the responsibility of the Pipefitter Shop, and the--

Q. I'm sorry. Perhaps I haven't phrased my question too well. When there is work on parts of a system, the ship's force may do some of the work and the Shipyard may perform work on other parts of it.
A. Yes, sir.

Q. In such a case, where both groups have done work, who would the basic responsibility for the system itself fall upon?
A. The responsibility for the system, of course, always belonged to the ship. However, the work would be the responsibility of the Shipyard if they had worked on that system. There were systems that the Shipyard did not work on. This would be, of course, the ship's responsibility, and as such, if there was something wrong, the ship would repair it, or it would be considered a new work item for the Shipyard.

Q. Do you feel then that responsibility was well understood by the ship as far as systems are concerned?
A. Yes, sir.

(b) (6) relieved (b) (6) as reporter at this point.

Questions by a member, CAPT. OSBORN:

Q. Did you operate the clutch during your fast cruise, both fast cruises?
A. Yes, sir.

Q. Did you operate the EPM?
A. Yes, sir.

Q. The Emergency Propulsion Blower?
A. Yes, sir.

CAPT. OSBORN: I have some other questions I want to ask, but they are classified.

Questions by a member, RADM DASPIT:

Q. What was your rate as an enlisted man before you became an officer?
A. Interior Communications Chief.

Q. You indicated that the "M" Division had to work very hard, twelve hours on, twelve hours off. This is routine sometimes. What was the nature of their difficulty in general?
A. In general, sir, the steam valves that had been sitting dry for a period of six or eight months and the packing had dried out. I believe their major ship's force work item was repacking valves.

Q. You mentioned that you were preparing for qualification. Was this for qualification in submarines as an officer?
A. I was preparing for qualification in submarines as an officer and working on my notebook; however, most of my time in qualifying as an engineering officer watch.

Q. You had qualified as an engineering officer watch on other types of plants, but on this particular plant you had no opportunity to do so before this period?
A. That's correct, sir.

Q. You indicated that the conference to abort the first "fast cruise" was in the early morning. Can you pin that down a little more -- just before breakfast, or one o'clock in the morning?
A. Yes, sir, it was about one o'clock in the morning; sometime after midnight; I don't recall the exact time.

Questions by the president, VADM AUSTIN:

Q. Lieutenant McCoole, you stated that twenty percent of the hydraulic valves were operating backwards and that there were numerous hydraulic leaks. You further stated that all valves were corrected. Who pointed out the valves that needed to be corrected? Did the Shipyard find them or did the ship find them and ask the Shipyard to correct them?
A. The ship found the majority of them. The Shipyard then, checking out and timing the valves, found a number of them.

Q. It was partly the Shipyard and partly the ship found the defects and pointed them out?
A. Yes, sir.

Q. With respect to the after group low solenoid valve, was that a defect which would have a low probability of recurring after repair or a high probability of recurring after repair?
A. I can't answer that, sir. I've had no other experience with this type of solenoid valve.

Q. Did you replace the entire solenoid valve, or did you just replace a part of it? Do you recall? Or did someone just bang it with a wrench and it worked?
A. As I recall, sir, we checked it out electrically and found that the solenoid was energizing, then we turned it over to the Shipyard. I believe that they replaced the valve, sir.

Q. Replaced the entire valve?
A. Yes, sir.

Q. You rode back and forth a bit with the Engineer Officer, I believe?
A. Yes, sir.

Q. And during these rides you naturally "talked shop" some?
A. Yes, sir.

Q. You indicated that the Engineer Officer was a little disappointed to have the "fast cruise" aborted because he felt that there should be a little more ship training in casualty drills. Did he seem, after the Captain had made the decision on this, to persist in this feeling at all, or did he just feel that he sort of wanted to have a few more drills and the Captain said there were more important things and that's that?
A. The Captain was aware, sir, that more drills were necessary, and he explained to us that if he allowed the "fast cruise" to continue on into the third day, the probability of getting another "fast cruise" period may not be possible. And I think with this explanation the Engineer Officer felt differently about it.

Q. He preferred to knock that one off so that you could get another one in before sailing time?
A. Yes, sir.

VADM AUSTIN: I have some other questions, too, but they are all liable to elicit classified information so I will defer them until closed session. But I wish before we finish your hearing at this time to say that we do appreciate the detailed testimony which you have given us and the care with which you have given it, especially in view of the fact that we know that this has been a period of considerable emotional stress for you. We will wish to talk to you in closed court.

REDIRECT EXAMINATION

Questions by Counsel for the court:

Q. What was your general over-all evaluation of the quality of the work done on your ship by the Shipyard?
A. I felt that the work accomplished by the Shipyard was very good. We were completely satisfied with all the work they did, and if we were not completely satisfied and let the Shipyard know about it, it would be corrected.

Neither the counsel for the court, the court, nor the party represented in the courtroom at this time desired to further examine this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had nothing further to add.

The witness was duly cautioned concerning his testimony and withdrew from the courtroom.

PRESIDENT: Let's take a little, short recess, shall we? A short recess.

The court recessed at 1510 hours, 18 April 1963.

The court opened at 1536 hours, 18 April 1963.

All persons connected with the court who were present when the court recessed were again present in court.

(b) (6) :, Chief Yeoman Acting, U. S. Navy entered and was sworn as a reporter at this point, whereupon he was dismissed and withdrew from the courtroom.

Frank DeStefano, Chief Machinist's Mate, U. S. Navy, was called as a witness for the court, was advised of his rights under Article 31, Uniform Code of Military Justice, was duly sworn, informed of the subject matter of the inquiry, and examined as follows:

The witness was cautioned not to testify concerning classified matters in the open session of court.

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rate, organization and present duty station.
A. Frank DeStefano, Chief Machinist's Mate, United States Navy, temporarily assigned U.S.S. DOGFISH.

Q. DeStefano, please describe your naval background and experience?
A. I enlisted in the Navy in 1952; served in destroyers GMAT and RCONR, served aboard the Destroyer Tender EVERGLADES; and served a three year tour of instructor duty. In 1961 commenced training for the Nuclear Power Program; and in November, 1962, arrived at Portsmouth Naval Shipyard for duty in THRESHER.

Q. To what duties were you assigned in THRESHER?
A. I was assigned to Chief Wise and Chief Arsenault in the supervision of "M" Division ship's force personnel in the progress of completing the shipyard overhaul.

Q. Did you stand watches in the "M" Division?
A. Under instruction, sir.

Q. What watches were you standing?
A. Engineering Petty Officer of the Watch in port under instruction and, during "fast cruise", AMS Lower Level.

Q. When you say "AMS" are you referring to the Auxiliary Machinery Spaces?
A. That's correct, sir.

Q. Would you be careful in making your replies understandable without abbreviation where you can?
A. Yes, sir. And Engine Room, Upper Level, under instruction.

Q. What was your first impression of the crew when you reported aboard the THRESHER -- competency, experience, morale, the general impression you received as a new man reporting on board and being quick to evaluate your new ship?
A. Very favorable impression. The men of the THRESHER, I felt, were about the most harmonious group of men I ever had the privilege of serving with. At times I felt as if I was trespassing to come aboard their ship. But they were eager to help, very eager to have someone else learn their job as well as they had learned it themselves. Speaking of the gang to which I was attached to, I can say truthfully that they were the most educated men in their particular functions that I have ever encountered.

Q. What was the attitude of the men towards the Captain?
A. At the time I came on board, Captain Axene was Commanding Officer and -- I'm sorry, I can't think of words to describe it -- but they just felt as strong a feeling of pride in working for Captain Axene, again, as I have ever seen.

Q. And what was the general feeling towards the competency of the officers attached to THRESHER?
A. The men had a great deal of respect for the officers, the Chief Engineer in particular. The feeling was that these officers were learning every job that all the enlisted men were trained in particularly, and they seemed to really have a great deal of respect for them and the fact that they were taking on a monumental job, and this seemed to really draw the officers and men close together.

Q. What kind of work was going on in your Division at that time?
A. I assume you mean from the time I reported aboard, sir?

Q. Yes. We're still at the early times. We are trying to see that ship and the people in it and the work being done through your eyes and your memory.
A. When I arrived on board THRESHER she was in drydock and the biggest job that was continuing was the changeover from the cellulube hydraulic system to the hydraulic petroleum oil base type. The other jobs of large consequence were the changing of the condensate pumps, the changing of the motors of the ASW pumps, the changing of the hydraulic pumps, the installation of new boots, fabric type exhaust trunks. There was a great deal being involved in the primary plant which, I believe, is not to be brought up at this time.

Q. Without reference to the boots, describe the major jobs which were done under your direct observation at this point?
A. By shipyard personnel?

Q. First by shipyard personnel, and then by the ship's crew, so that we can know what work was seen by your eyes, the nature of it, and the quality of it?
A. The installation of a new high pressure prime pump. This involved a great deal of rigging and cutting areas of the deck plating out to bring it down to the lower level. The installation of flex hoses in the ASW system to go along with the new check valves.

Q. Was that done under your immediate observation?
A. I was in the engineering spaces when a great number of these check valves were going in; however, inspection was always held off until each particular section of line was complete.

Q. And then were they checked?
A. Yes, sir. And in some cases -- not to exceed fifty percent of the cases-- we noted check valves installed backwards, And also, due to the check valves--well, the hoses had to be given a certain degree of bend in order to fit this check valve in the line. This check valve was a modification. The flex hoses being bent like this caused some problem due to conflicts with Bureau letters. However, the Chief Engineer in pursuing the problem received a letter from the design personnel of the Shipyard stating that this, in fact, did not cause any unforeseen problem.

Q. Did it cause any problem thereafter to your knowledge?
A. No. The hydro of the ASW system, it was quite a long time in running. It had to be postponed a couple of times but eventually the system was hydroed to proper pressure.

Q. When you say "hydroed", do you mean it was subjected to a hydrostatic test?
A. That's right, Captain.

Q. What other major items came under your observation?
A. The installation of air motors to the lube oil system on the SSTG. More recently, the installation of a new bracing device on the b(3) 10 USC 130 valves.

Q. Were there any difficulties in connection with those?
A. The b(3) 10 USC 130 valves, this was a problem that was noted just prior to our being tugged over to the Sound Pier approximately the first of April. It was noted that theb(3) 10 USC 130 valve stem was bent.

Q. Was that fully corrected at the end, do you know?
A. What do you mean by "the end", Captain; I'm not sure.

Q. Prior to the ship getting away, at end of her post-shakedown availability?
A. Yes, sir. The ship was brought into drydock after the Sound Pier was finished with us and a new stem was installed along with the new bracing device on b(3) 10 USC 130 valves.

Q. They were tested and found to be all right?
A. Three worked fine, but the one that was initially bent to begin with did show some sort of movement to the foundation of the structure on a cycle.

Q. Did it affect the operation of the valve in any way?
A. No, the valve moved and it moved in proper timing. It also held tight. I was a witness at the test --

Q. You saw this then?
A. I saw the test when completed. It was not subjected to a high pressure but it was subjected to normal ASW pressure to check for large leakage.

Q. The normal auxiliary salt water pressure?
A. It was shore ASW. There was no salt water pressure because we were, in fact, at this time taking auxiliary salt water from the pier.

Q. Now I know we've run on a little ahead, DeStefano -- how do you spell your name, incidentally?
A. D-E-S-T-E-F-A-N-O.

Q. I know we've gone on a little ahead, but I would like you to cover anything which has been left uncovered in your testimony which you believe is of significant interest to the court in the period before the first "fast cruise".
A. Before the first "fast cruise" there were various evolutions that were to take place which required the crew to split itself up into two groups. I stand corrected, please. The "M" Division was in two groups; the rest of the crew was split up somewhat differently, three groups, or something of that nature. This required long hours of work and it involved testing of primary plant components and also some steam components. At one point we had a casualty to the steam system which resulted in some steam escaping into the engine room. Due to immediate action of the crew this problem was completely eliminated almost instantaneously. No damage to personnel or equipment came about. The cause of the problem was a valve, ashore steam valve, that was left on the steam lines acted somewhat as a relief and popped off when the steam pressure was subject to it.

Q. Was this discrepancy corrected?
A. Yes, Captain, immediately; as soon as the problem was noted.

Q. Immediately by the ship's crew?
A. Yes, sir.

Q. By this time you had a new Commanding Officer on board; is that correct?
A. Captain Harvey.

Q. And from your knowledge, to your own knowledge, what was your evaluation of the new Commanding Officer?
A. I was privileged to speak to Captain Harvey twice in his stateroom alone and he impressed me a great deal. The man had a great deal of faith in his men, his crew, his ship. He was attempting to help me for the interview that I was scheduled for later on. In spite of his tight schedule he managed to spend a total of over two hours with me, and I can assure you at this time his schedule was extemely tight. Captain Harvey seemed to be a very quiet man and the crew was waiting to evaluate him. But this is normal. I think in time they would have grown to have the same feeling for Captain Harvey as they had for Captain Axene. It's just that the ship had never been under way with Captain Harvey and no one really knew him. He was a very quiet Captain. He never forced himself on people.

Q. Did he seem to know his business?
A. Yes, Captain.

Q. Now to clarify that problem with the b(3) 10 USC 130 valve, were there one or four new stems installed?
A. One new stem, but four tracks were installed.

Q. At this time work was being done on the ship by the ship's company as well as by the shipyard?
A. That's right, sir.

Q. Did the work progress in a harmonious way or otherwise between the two different forces?
A. I'd say harmoniously in both respects. The shipyard did not work with the crew on any one particular job. It was strictly if the shipyard wanted advice or wanted help in locating something or help with equipment, the crew was always willing and able to help them, but we never worked on a particular job with them, except some of the chiefs when they were trying to resolve a certain problem on a certain piece of equipment talked very closely with the leadingmen.

Q. Was there any misunderstanding about who was responsible for doing what work?
A. No, Captain, none.

Q. Looking back through your memory to the period before the first "fast cruise", can you single out anything of significance which you haven't told us?
A. May I refer to some notes, Captain?

Q. Please do, to refresh your recollection so that you can testify to us of your own knowledge?
A. Before "fast cruise", during our steam OPS we found a reducing valve and also a by-pass around a reducing valve on the steam -- this was on the auxiliary steam system -- we found it to be faulty. This was corrected by ship's force with the assistance of the shipyard. b(3) 10 USC 130
The Chief Engineer wanted all heat sink components in proper function before taking a reactor critical.

Q. And that work was accomplished?
A. Yes, sir.

At this point (b) (6) relieved (b) (6) as reporter.

Q. During the first fast cruise, do you recall the date of that?
A. The first fast cruise was on the 23rd of March.

Q. At what time did it begin?
A. I don't recall, sir.

Q. In the morning or the evening?
A. I'm sorry, Captain, I don't recall.

Q. Can you recall when it ended?
A. It ended in the middle of the night, sometime between midnight and four in the morning. It was aborted.

Q. On what date?
A. On, well, it would be the 26th, in other words the beginning of the 26th day of March.

Q. Counting in days and fractions of days, how long would you judge that it lasted?
A. About two and a half days.

Q. Describe the drills that were performed in the engineering spaces during that period.
A. During the first fast cruise?

Q. The first fast cruise, yes.
A. Loss of lube oil to the turbines.

Q. That was a drill -- you are referring to drills, are you not?
A. Yes, sir.

Q. Very well.
A. Loss of ship's service to the turbine generator. Loss of automatic feed to the steam generator. I'm sure there must be more, Captain.

Q. Would you say, in the engineering spaces at least, that the drills were small in number or moderate or comprehensive and complete?
A. We completed all types of casualty drills with regard to the secondary plant, that we had scheduled to complete, and we had no incidents or malfunctions of any type so far as the secondary system goes. I say the drills we were supposed to hold, Captain, we did hold and it was without complications.

Q. From your point of view, from your judgment, how well did those drills go?
A. At first it was a walk-through, which means it was a drill where everything was taken step by step by step, and the completion was in no rush, and this was handled fine. Each section had to complete the drill other than a walk-through--I mean complete an actual drill, and the sections that I was standing watch with completing all drills satisfactorily and I thought with a high degree of efficiency.

Q. Do you know of your own knowlege of any drills that were not done satisfactorily at that time?
A. On the first fast cruise?

Q. Yes.
A. You are referring strictly to engineering?

Q. Yes. I'll find out about your secondary sources of information later.
A. None that I'd call unsatisfactory, Captain.

Q. How do you wish to leave it with us then, somewhere on the borderline of unsatisfactory, or how?
A. I'd like to leave it that had these casualties in fact happened on board; had they been real, no damage would have been done to any equipment or personnel.

Q. Thank you. Now, at the noonday meal and in chiefs' quarters you got to know what was going on in other parts of the ship during these drills, did you not?
A. Through secondhand information, sir.

Q. Yes. Can you tell us all you learned at that time about the progress of the drills in the other parts of the ship?
A. A common item that was brought up was the men are spending too much time trying to get theirequipment functioning, that the time for drills were more or less cut down, and I can recall their kinds of statements. One statement made was everytime we have a drill we have a real one in addition to the one we're trying for, but it was said in a manner of well-"let's get with the program and get the thing working" and not the sense of everybody throw up their hands and quit. I understand they were having problems with air.

Q. Did you learn the nature of the problem?
A. They were having problems--

Q. Without mentioning the exact pressure, you can say "high" and "low."
A. They were having problems with the reducers that were reducing these air pressures and also with the automatic valves, the Marotta valves, the electrical end of them because of the valve leaking by so badly the solenoid equipment couldn't pick up the valves and they had to operate them locally. They were having problems with servo-valves on hydraulics; the accumulators were continuously cycling, even though no components were operating, because of the leakage through the valves. They were firing water slugs, and I didn't hear too much on how this operation went although I did hear they were having trouble with one outer door on one of the torpedo tubes.

Q. Do you recall whether that was number 3 or number 2?
A. That is the number I recall, sir, number 3.

Q. During that period, you were aft, is that right?
A. That is right, Captain.

Q. There were no major problems aft?
A. During fast cruise?

Q. Yes.
A. No, Captain, We were in beautiful shape then.

Q. Try to remember as best you can with regard to the air system, do you recall whether the air system was being tested--did you hear the after ballast tank being blown?
A. No, Captain, I never did although I was not back in the engineroom all the time, 24 hours a day. Quite a few of my watches were spent in AMS, so I cannot truthfully say I have heard air blowing the ballast tanks.

Q. Did you learn from your contacts with other members of the ship's company whether or not they were blown during the tests in the first fast cruise?
A. I cannot think of any particular person mentioning it to me, but it was part of the fast cruise to simulate diving and surfacing, and whenever they dived or whenever they surfaced there was an operation made of the vents and the blow system so I just assumed that the after group was blown just like the forward group was, essentially.

Q. Did it come as a surprise to the crew when the first fast cruise was terminated by order of the Captain before its scheduled completion?
A. I believe we were anticipating it, mainly because of the problems they were having up forward. It was, I can't say it was shock or surprise that it was terminated.

Q. I may have gotten ahead of myself. Did it terminate prior to its scheduled completion time?
A. That is affirmative, Captain.

Q. When was it scheduled to end?
A. Well we were shy by approximately one and a half days, that we would have--I am not sure of the date--the 27th.

Q. You told us that the accumulators were continuously cycling. Are those located aft?
A. That's right, Captain.

Q. What did you mean by continuously--every five minutes or ten minutes?
A. It would vary. Five minutes if nothing were operating. I wouldn't think they would last over five minutes. Normally it was less.

Q. Is there anything more of significance that you can remember about that first fast cruise?
A. Not at this time, Captain.

Q. Well after that there was a short period between the first and second fast cruise, was there not?
A. That's right, Captain.

Q. During that period of time, what occurred of significance on board the ship?
A. There was a period of Weep corrections which was quite an effort put on by the yard and by the ship's force to get the ship to where we could complete the fast cruise.

Q. You mean that the ship's company and yard workers were engaged in accomplishing lots of jobs to correct deficiencies?
A. Yes, Captain. In fact, back aft we were working mainly on the deficiencies of a minor nature, repacking of valves, etc. The main work that I believe was done, was done on the air--air system and hydraulic system.

Q. And were you familiar with the work done on the air system?
A. Only to the extent that it restricted a lot of our use of air back aft which required us to continually check with the forward auxiliary gang and it always turned up that the reducers were out and it seems quite often that the reducer would be installed, tested, be unsatisfactory and be removed again. Other than that, I have no other knowledge of the air system except for the Morotta valves that I mentioned that wouldn't operate.

Q. Before the second fast cruise, did they get those things operating so they would stay operating?
A. They were operating when we started the fast cruise.

Q. And the hydraulic system, was that all completed?
A. That is right, Captain. Everything was operating. As to the peak of efficiency that it was operating, I can't testify to that.

Q. Because you didn't work on it, you mean?
A. I didn't work on it and there was so much going on I couldn't quite keep all these things in mind.

Q. Do you remember anything else before the second fast cruise that you think would be of interest to the court?
A. We had difficulty during the fast cruise with a gauge line. This was repaired in interval time in between the fast cruise. This was a small line; this was not a large line.

Q. Was it thoroughly tested before the second fast cruise?
A. I can't testify to that, Captain. I know the fitting was brazed, but I can't testify to any hydrostatic test on it. This was a one-eighth inch line, I believe.

Q. When did the second fast cruise begin?
A. On the 31st, on a Sunday.

Q. How long did it last?
A. I believe somewhat over 24 hours, not more than 26 hours, I would say.

Q. Can you give us the times, an estimate of the time?
A. It commenced at eight o'clock on a Sunday morning and terminated, I believe, at ten o'clock Monday morning. I'm not positive of these hours but as I recall it started on Sunday morning and completed on Monday and I believe it was in the AM, that is before noon.

Q. What drills were conducted during that time?
A. Flooding drills, fire drills, hydrogen gas, radiation drills. That's all I can recall right now, sir.

Q. Were these general ship drills, sir?
A. Yes, sir. They involved the whole ship. We had two cases where we split up the ship and that was on flooding drills. We had one drill for flooding up forward and one drill for flooding aft.

Q. How did the drills go?
A. The flooding aft drill was not really a high degree of success due to new piping that was introduced into the ASW system; here we had little problems in isolating b(3) 10 USC 130 our ASW system. It took approximately 20 minutes to b(3) 10 USC 130 This was a simulated leak in the auxiliary sea water system in which case we had to isolate half of the ASW system and it took us a little while.

Q. Did you finally get it to where you wanted it?
A. Yes, Captain. We finally did get it b(3) 10 USC 130 but it took a lot of people doing a lot of thinking trying to find out where we could b(3) 10 USC 130 it.

Q. What was the nature of the new piping installed in the auxiliary salt water system? Was that a repair or an alteration or what?
A. Well, I am not familiar with the old piping. I arrived on board after the new piping was put in. There is a run of piping for the primary sample sink which involved the use of auxiliary sea water and this is where we found the point where we were crossing the system resulting in the relocation of valves on this line I understand to have a cross-over system.

Q. Is there anything else you can think of that occurred during that second fast cruise which would help us in our inquiry?
A. No, Captain, not at this time.

Q. Well, after it was over, how did the crew feel about the results of the drills?
A. The auxiliary sea water system?

Q. The second fast cruise.
A. On the second fast cruise?

Q. Yes.
A. Being a good crew as they were, they weren't particularly happy with their performance on the fact that they weren't as sharp as they were when they were in their prime before the ship came to the Shipyard, but this is something they knew. Their faces were a little red but they still had confidence in themselves and in their shipmates and also in the ship.

Q. What did you think of them?
A. I thought they performed beautifully.

Q. Was there any difficulties with the communication system during the drill that you know of?
A. In communicating with each other?

Q. Yes.
A. We had some feedback through the ZMC speaker, especially the one in the tunnel but nothing to cause a complete lack of communications from people in different spaces.

Q. They were able to communicate with each other?
A. Yes, sir.

Q. After the second fast cruise, what work was done on the ship?
A. A great deal of lagging, final hookup to high pressure brine pump, some installation offlex hoses. We had an inspection team come around from Code 303, I guess.

Q. Of the Bureau of Ships.
A. Of the Shipyard. And it resulted in a lot of flex hoses being replaced on oil systems, some on sea water systems. There was a great deal of lockers installed, a great deal of cleaning, painting.

Q. The ship was getting ready to go to sea?
A. That's right, Captain.

Q. Was there anything of a significant nature then between that time and the time she went to sea that you remember?
A. Other than the b(3) 10 USC 130 valve?

Q. Yes.
A. Not that I can recall at this time.

Q. What were the circumstances of your getting off the ship before she sailed?
A. About six weeks before sailing I had a letter from the Bureau of Ships Code 1500 to report to the Navy Building where Admiral Rickover and his staff are, for interview for possible retention extension in the nuclear power program after commissioning in September.

Q. After you were commissioned in September, is that it?
A. Yes, sir, and I was to report to the Navy Building at 0800 on the 11th of April. My orders were cut and I was immediately transferred from the ship prior to 0800 on the 9th of April.

Q. And when did you in fact leave?
A. I left the evening before the ship got under way.

Q. What did you think of that ship?
A. I thought she was sound, seaworthy, extremely well manned.

Q. What's your best judgment of the quality of the work performed on her by the Shipyard?

A. The quality was varied depending on what particular components or what jobs were being worked on. Where the Shipyard was working on a component that required a good machinist, the quality was good. Where they were working on a component which anybody could put together, some of the work was sloppy, but it was largely a matter of leaving a pipe hanger out or a check valve would be installed backwards--things of that nature. But where the component to be worked on was something of importance, where they used a good machinist, a good worker, the work was always good.

EXAMINATION BY THE COURT

Questions by a court member, Captain Osborn:

Q. How did you have your "A" division organized? You referred to "A" Division forward.

A. The Auxiliary gang was a separate non-nuclear trained gang that came under the charge of a chief--an engineman chief,--and also by a division officer, but they were not incorporated with the "M" Division at all.

Q. Did the "M" Division have custody of the ASW system?

A. After ASW system.

Q. Do you have any idea how they were going to operate the stills on their sea trials?

A. How they were going to operate them?

Q. Yes.

A. I know they were going to.

Q. Did they have a special 24-hour test or something like that?

A. Yes, sir. A test was to be performed on the stills. One of the items was the acid cleaning of the stills on fast cruise and this was in preparation for sea trials at which time we would run the stills and this is the job of "M" division to run the stills, not "A" Division. And part of our test was on the high pressure brine pump which had been previously tested while in drydock on the closed system for the high pressure tank and use of ASW shore water.

Q. Did you have a 24-hour run on the still scheduled or anything like this?

A. Yes, sir. I am not sure of the time element but there was a period of time they were going to run the stills during sea trials.

Q. That's all I have. I thought you might have known the specific schedule when they were going to run the stills.

A. I read the agenda but I can't recall the time or when it was going to happen.

Questions by a court member, RADM Daspit:

Q. You spoke about check valves and the fact that some of them were installed backwards. Were they in the part of the ship where you worked so that you knew this firsthand?

A. That is right, sir, Admiral.

Q. Were these discovered installed backwards, by the Yard before they turned them over to the ship?

A. No, Admiral. This was found by the ship's force.

Q. Well, were they found by ship's force before the Yard had completed their work and tested it or had they been turned over to the ship as completed work before the ship found them installed backwards?

A. Well, most of the time, the way we found it, in the process of lining up a system, especially after a couple of times when we went to light off a unit and in the lighting off of a unit, checking why there wasn't a water flow in a certain line, we would find the check valve in backwards. This led us to investigate the check valves before operating any equipment and then prior to the yard turning over the entire system to us, the entire division went all out one day and every man just went completely through, checking check valves to find out which ones were in backwards, and we turned up quite a few. It's not really easy to check them; they have a very fine mark on them and the mark always seemed to be obscured by either another pipe or a lagging or something. I don't mean lagging over the check valves; I mean the check valve being turned in such a way it was almost impossible to visualize the indicator.

Questions by court president, VADM Austin:

Q. DeStefano, you have told us that there was some new piping in the auxiliary salt water system aft which made difficult the carrying out of a drill involving that system. I believe you indicated, though I am not certain that you covered this clearly--was this due to the fact that the personnel were unfamiliar with the new rig and the location of the valves or was it due to the manner of installation?

A. No, it was due to the unfamiliarity of the crew, the line-up, the normal line-up that we used for putting the system, the whole ship, in normal line-up. These valves were not included on it so therefore they were by-passed.

Q. I see.

A. I hope I didn't give the wrong impression that once we found these valves, that this made the ASW system b(3) 10 USC 130

Q. b(3) 10 USC 130 Now you left the ship on orders from higher authority the day before she sailed?

A. The evening before she sailed, sir.

Q. Although you had gone through the fast cruise?

A. Yes, sir.

Q. How many chief machinist mates are in your particular division?

A. Two others besides myself.

Q. Two others besides yourself. Was any Chief Machinist Mate put on board to replace you when you were taken off so quickly?

A. No, Admiral, I was the junior chief. I was strictly still under training.

Q. You were still under training so that your departure did not leave a gap in the crew?

A. No, Admiral.

Questions by a court member, Captain Osborn:

Q. You know that an ASW system is an extremely complex system, involving multiple sizes of lines and isolating something completely is a very difficult job. Did you have any drills or any procedures on the ship with respect to degree of isolation--major, minor-isolation procedures with respect to the ASW system?

A. You mean the fact if there were a minor leak we would try to isolate it and if it was a major leak, the whole thing would be shut down?

Q. Yes.

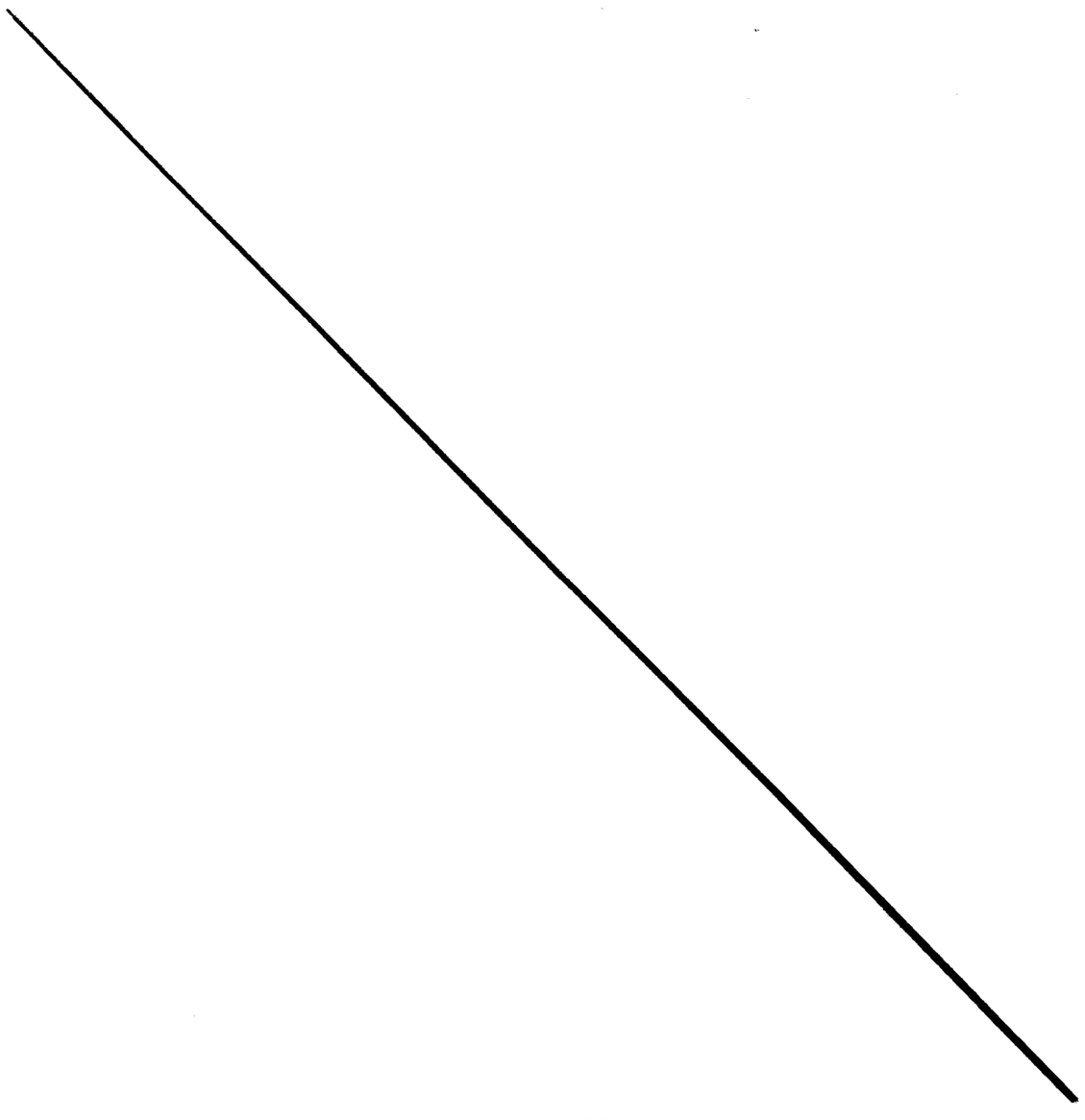
A. Right. In the event of a major leak we wouldn't try to isolate or b(3) 10 USC 1 It would be completely shut down, all sea valves and the complete isolation of the system from the sea with no regard to the components being served by the system.

Q. And can you do this from one station?

A. No, sir. It requires two stations in two different compartments in order to completely isolate the ASW system.

Q. Would there ordinarily be good communications with respect to fast reaction, particularly in the auxiliary machinery space?

A. If I may, you mean if we had a major leak--there is a circuit down in the auxiliary machinery space lower level where a man can pick up a phone, pull a lever and report over the entire ship "flooding in the AMS lower level" and there would be a man up above that could isolate the stops in the auxiliary machinery space and also upon this word the man in the engineroom would probably go back--although there is no guarantee unless he knew it was major flooding--would go back and isolate the stops in the engineroom.



Q. Bearing in mind that this deep dive was the first one after a long period in the yard, do you think it quite likely someone would be very close to that manifold and probably have communication?

A. No, Captain. The manifold is not in a place where a person normally would be.

PRESIDENT: But in the same compartment, and the same level in which the watch stander would be?

WITNESS: There would be in the upper level auxiliary machinery space, yes, sir.

PRESIDENT: There would be, but not in the immediate proximity of these particular controls?

WITNESS: No, Admiral.

By Captain Osborn:

Q. This would be probably just a question of who would be there. This would in all probability be an electronics technician, is this correct?

A. That is correct, Captain.

Questions by RADM Austin:

Q. And roughly, what would be the average distance from these controls that the watch in that space on that level would be from the controls?

A. Well, laid out in a straight line, Admiral, I would say about from you to me.

Q. But it isn't a straight line, is it?

A. No.

Q. It is a dog leg?

A. It is coming in between the panels and turning in back of the electrical panel. There is a passageway.

Q. So it is a dog leg which would add up to the distance between me and you?

A. That is correct, Admiral.

PRESIDENT: Any other questions?

COUNSEL FOR RADM Palmer, Captain French: I have no questions.

PRESIDENT: The court will want to ask some questions in closed court of this witness but I think, counsel, if you have other open-court witnesses that you would like to bring in at this time, it will obviate the necessity to close the court.

COUNSEL FOR THE COURT: I don't think the next witness is scheduled for open court. We have no more for this day that are in open court. We might close court now and finish this witness in closed court before we call the first closed-court witness.

PRESIDENT: I am sorry, ladies and gentlemen, but we are going to have to ask you to leave us and we can promise you there will be no more open-court proceedings today.

The members of the press then withdrew and the court met with closed doors.

PRESIDENT: Do you have any questions, Counsel?

COUNSEL FOR THE COURT: None at all.

(Examination by court members continued)

Questions by a court member, Captain Nash:

Q. I have a question which is not classified. You have stated your opinion that the ship was sound and ready to go, and so forth. I want to ask you what you heard in the way of conversation from the rest of the crew. People are different; they react in a different way. Would you tell us anything that you might have heard from other people indicating the feeling of different members of the crew?

A. People up forward were--they were feeling, I don't know how to put it.

Q. Are you speaking of the wardroom now?

A. No, I am sorry, I am speaking of the men forward of Frame 52, who worked forward of Frame 52.

Q. Right.

A. They were going to go on port and starboard watches because of so many untrained men in the forward part of the ship. All I can think of, Captain, is favorable things that keep popping into my mind. They weren't concerned over the ship that this wasn't safe, or that wasn't safe. At the last, I think they felt a lot better. There seemed to be a feeling of relief when we went into the drydock to have that torpedo door taken care of, but this was not by the majority. The majority of the men felt that there was no real danger with this door, that this was my understanding that we were not going into drydock to have it fixed before sea trials. We were going to come directly from sea trials and have a drydock waiting for us. In fact, the Captain made it somewhat known that he wanted to come in on the proper tide so he could get right into drydock for the torpedo door, but when the b(3) 10 USC 130 valve popped up, they decided to terminate or delay the sea trials, go into drydock, have the sea water valve and the torpedo outer door taken care of at that time.

Q. You are answering exactly the question that I wanted and if I may pursue this one just one bit farther. After any unfortunate event like this, there are often rumors circulated and some of these have indicated individuals expressing before their departure on the last sailing, doubt as to the safety of the ship. Do you recall any such indication?

A. In jest, maybe, but this is normal. This is something they talk off the top of their head. There are two cases that I am thinking of--maybe you are thinking of the same two. Are we supposed to mention names?

Q. Perfectly all right.

A. There was number one, (b) (6) He was a man in my gang and he is a first class machinist mate that had come from an FBM and he was under the impression he was going to shore duty soon after he arrived aboard THRESHER and every day he was wondering where his shore duty orders were, and actually I felt he was quite an irritable fellow. I mean, everything seemed to annoy him.

Questions by Court President:

Q. I think he just had itchy feet for shore duty. Was he married or about to get married?

A. He was married. One day the engineer found out he wasn't going to shore duty and the engineer notified him of this, and he was a changed man after that. I mean, you couldn't have found a nicer calm guy. All of a sudden he began to help everybody. Now he never mentioned anything to me that he didn't think the ship wouldn't come back. He often would say, "This sure isn't any FBM" or something like that, but that was always going on. To anybody that came off an FBM, we weren't so hot. And I'd also like to state on (b) (6) 2nd class machinist's mate. he also worked for me and there was by far no better man to have on a submarine than (b) (6) I think it was mentioned in the paper where he wanted to transfer off there. He wanted to transfer every day except when he had the duty weekends and then he wanted it twice a day. He always talked, never stopped talking, was continually griping and he told this to me and he told it to other people--I am not sure any of those other people are around now--but his biggest goal in life was to be chief-of-the-boat, of the THRESHER. Now, this is not a man that is trying to get off a ship.

Q. In other words, he was a fellow who enjoyed griping?

A. To put it in his words, Admiral, he wanted to be "chief of the whole mother heifer." (b) (6)

Questions by Court Member, Captain Osborn:

Q. I want to question you a little bit about what you thought was the safety of the ship. Now, what did you think was the most dangerous system in the engine room? I am referring with respect to flooding.

A. The ASW.

Q. Did you have any particular area of the auxiliary sea water system that you were more worried about than another one?

A. Yes, sir, the constant vents on the SSTG. The bed plate is designed to move, yet--on that, I will have to retract that, because they did change that. They had one on the b(3) 10 USC 1 SSTG that went from the hose that goes from the constant vent line. The vent portion was attached to the part of it that would move and already she was taut. I mean, you could see that there was very little that she would move but 303 picked it up and they did, in fact, change that.

Questions by Court President:

Q. How did they change it, Chief?--Did they allow a little slack by curving it, or just how did they do it?
A. No, they didn't put a curve in it but the hose didn't seem as taut.

Q. It allowed a little more lee way?
A. They seemed to. I am trying to think now.

Q. Do you remember whether or not you ran the ship service turbo-generator while you were looking at that particular flexible coupling after it was allegedly fixed?
A. I can't recall, Admiral. I couldn't say, positively. I remember seeing the new hose on there and I remember it appeared to be better.

Q. But you didn't look at it?
A. I didn't concentrate on it.

Q. To your memory, while the generator was operating?
A. No, Admiral, I am sorry.

Questions by a court member, Captain Osborn:

Q. I am referring to larger lines, the constant vents on the SSTG are b(3) 10 USC 130
A. b(3) 10 USC 130

Q. b(3) 10 USC 130
A. I beg your pardon, the hoses.

Q. The inside is probably b(3) 10 USC 130
A. That's right.

Q. It is a very small line with respect to volume. On the big volume lines, what section did you have the most apprehension about, if any?
A. Any of the lines involved with any MG's which were--I am not sure of the size--b(3) 10 USC 1 line probably. They seemed to be in a vulnerable spot for a leak because if they did leak they'd have sprayed water--especially if they leaked upward--they would spray water onto or near the b(3) 10 USC --I mean, that would be very bad. I mean, you would lose everything. Your reactor would scram and that would probably be the most vulnerable spot right in that area there. Also, any other component using that size line.

Q. Now, obviously, you enginemen and particularly the chiefs, had discussed the particular margin that exists in the ship. Do you think that you could have a rupture of a four-inch line and it would bother you very much, or what is your general opinion from a standpoint of ship's safety?
A. On the surface?

Q. I am talking about at relatively deep depths.
A. At real deep depths I have only heard descriptions of what happens and to me it doesn't sound like you would have much time for thinking or trying to isolate it, or anything like that.

Q. Was this subject discussed very much with respect to the crew and officers?
A. Yes, it was, Captain--I can't speak for the officers.

Q. I mean, among the crew and officers.
A. The only thing that seemed to ease the situation is the fact that there were dates on which these flex hoses were changed. In other words, they could only be so many years old and they had to have a certain shelf ~~like~~ life and this we assumed would--well, like a great many other safety factors they are usually a hundred and ten per cent greater safety factor than what they are designed for, and we based our feeling that these hoses were all right on that.

(b) (6) relieved (b) (6) as reporter at this point.

Questions by Captain Osborn:

Q. Was there any particular area in the engine room itself that you sort of had more apprehensions about? I realize that your low level AMS upper level engine room watch standers, and these are lower level watches that I am talking about; did you have any area that you thought was a subject of more conversation with respect to the crew?
A. I can't think of any right now, Captain; maybe I have, but it's not coming to me right now.

Q. In case you had a flooding casualty, what do you think would be the first action that would be taken?
A. A major flooding casualty, the first action would be you shut the sea valves.

Q. With respect to propulsion?
A. With respect to propulsion we would continue.

Q. The question I was leading you around to, which does the crew consider-was far more important in a casualty, speed or air?
A. Speed; they had a great deal of confidence in that screw back there. Air they didn't care whether they had or not.

Questions by RADM Daspit:

Q. There was testimony in open court, even in the newspapers about the two chief electrician's mates, the brothers Shafer; did you know them?
A. Yes, I did, Admiral.

Q. Could you tell us a little--did you read the testimony in the newspapers?
A. No, Admiral.

Q. Could you tell us a little about their attitude?

A. Well, to start with, Ben Shafer, he was the E-9 electrician; he was more or less of an assistant to the engineer in handling all logs and other clerical type duties, extremely well tuned with the primary plant action, and one of the best qualified engineering petty officers of the watch that we had. He treated the THRESHER--well, "This is the ship and now we'll go." He wasn't a flag waver or anything like that, but he was conscientious of his job and he always tried new ways of doing it. He was relied on a great deal, especially by the officers in training, who needed guidance and help in their initial watches. His station on maneuvering was in maneuvering. He was probably the best chief petty officer, as far as engineering knowledge-wise goes that we had. His brother was with the electrical gang. He, too, was quite proficient. I don't believe he came up to the standards of his brother, Ben, but he was by no means any less than anyone else on board, especially any other chiefs, as qualified petty officer of the watch. The two of them got along famously; I never heard them argue among themselves. I can't think of anything else that might be pertinent to this.

Q. Well, that's enough on that subject. I'm still a little concerned about the check valves which were installed. What was the system of having the Yard go in and work on the valves?

A. The system was in the hands of the ship and I would presume that the Yard had to get the ship's permission to work on them and when they were finished, the ship could check that work out as soon as that particular phase was done.

Q. Could you describe how that work was done?

A. We didn't have the ASW system at this time, so every once in a while when we wanted to work on a component or try out a component we would take a little bit of that system and just to run water through it it wouldn't mean that we would have to buy that system; we would just try to flush the water through and if we couldn't get the water through the constant vent, we would go further and see how come, and the check valve was in backwards.

Q. Then you would get permission from the Yard to use that system. The yard had not completed their checks on the job?

A. No.

Questions by Captain Hushing:

Q. You mentioned earlier a section of piping which was put in the ASW system, I believe.

A. Yes, sir.

Q. Can you describe that section of piping in a little more detail?

A. Upstream of the reactor's fresh water system coolers, strainers, there were tapoffs that would enable us to flush overboard the primary coolant into a test tank under the primary sample sink, and both of these are open. We would, in fact, have b(3) 10 USC 130 Prior to this time, it was unknown whether we were going to have ASW b(3) 10 USC 130 , evidently, the system was left

lined up open. These new valves that were installed were not on the check-off list of the rigging for normal shutdown condition, so when we went to hold this drill, b(3) 10 USC 130 it turned up that we were still getting water. I say that this was one place; there may have been others. There were so many people running back and forth checking valves, but this was one particular place that happened to stick in my mind. They did say, and it was brought out that these valves were new. I'm not sure how much of these pipings were new but these valves were new, because they weren't on the checkoff list.

Q. Were the valves put on the checkoff list?

A. Well, our permanent checkoff lists are laminated and they were left over from before. I believe when we had our new prints made up these valves were included on it, which meant that we were going to take our new prints and have them laminated, which we would put in the maneuvering area, and this way we could use grease pencils, but the print that was used for the checkoff for the normal valve shutdown lineup was in fact the old print.

Q. Do you have any feel for the condition just before you left the ship on the night before she got underway; which was still displayed, the old one?

A. I imagine the old one. With this crew, once something happens, everyone knows about it. I can't say which side that they decided, but this side was going to shut and we'll use this side open. That way we know how the system is lined up.

Q. Then, from your knowledge of the crew, you believe that b(3) 10 USC 130 when the ship got underway?

A. No, Captain. I believe that it was not open; I believe that they had the lineup that they wanted.

Q. Would it have been likely that the b(3) 10 USC 130 during any of the scheduled operations of the ship prior to deep dive?

A. I couldn't answer that, Captain. Right now, I can't think of any situation which they might want to shift it. They might require shifting it if they were going to shift to a different cooler, but this is something I can't say.

Q. What is the size of the piece?

A. One inch or less. This is just a small flushing line.

Questions by CAPT Osborn:

Q. I have another question with respect to just the general thought, the way your thoughts about the ASW system. Did it appear peculiar to you that b(3) 10 USC 130

A. It appeared to me to be very peculiar.

Q. Was this a subject of discussion in the crew at any time?
A. Yes, it was a discussion, but never of concern. The only people that seemed to be concerned about it, were bewildered by it were people like myself who came from surface craft. so this loop business between two compartments, we always seemed to be looking for a bulkhead stop.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. You say you replaced many flex hoses; were those in the ASW system?
A. ASW system and the oil system, the hydraulic system. They replaced a great many of them. A great many of our hoses went out of date and had to be replaced.

Q. Were they large or small?
A. They varied in size. Every size there was about; some as much as four-inch lines, I believe; some were replaced right down to the small half inch.

Q. Did the replacement process occur at any given period of the PSA, or at different times?
A. I can't think exactly when Code 303 made their inspection, but it was in the latter part of our post-shakedown availability.

Q. What sort of a job is it, to do work of this kind; does it take any precision to do it?
A. It takes a special type of tool that they use for pulling these down but I don't think that it takes a first class machinist; I mean a first class yard machinist to do this but, again, you can't put somebody with no education down there just because he's got muscles. I would say it's important that the installation be made up properly, cleanliness, etc., but as far as a high caliber job requiring a yard leadingman or something like that, no.

Q. Do you know of any instances of marginally good work in this respect?
A. In the flex hose, yes, sir. A lot of twisting. They would grab hold of one end and with the wrench they would grab the other end and they would start tightening until it was like this (the witness demonstrated a bad twist), and every phase of this that was unacceptable to the crew we would weep it out, and they would come down and change it. I had experience with one yard worker; he was showing me how he was going to straighten it out and his whole feeling for the use of tools was outlandish. He was grabbing one end down here and the other end up there and with a dogleg in between. He couldn't understand why I was so concerned with this twist. He said, "You are going to have a little bit of twist" and the crew flatly told him that we would not accept any twist.

Q. Do you think you got any finally, or was it all cleared up?
A. It was all cleared up.

Neither the counsel for the court, the court, nor the other parties desired further examination of this witness.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement:

Is it permissible to talk about the shock tests that THRESHER went through?

PRESIDENT: Yes.

WITNESS: It was brought to my attention, strictly by hearsay in conversation aboard the ship, that during shock tests we suffered some damage in one of our PUFFS systems in the midships compartment, above the sonar room. In fact, after shock I understand that they couldn't dive to test depth because of this leak. In fact, they were restricted--I'm not sure of the figures, very shallow, one hundred, two hundred feet, and this was one of the areas that was removed during the PSA. Also, I cannot substantiate this, but the PUFFS units installed on the stern planes. I know of no other ship that has them or ever had them. Maybe they have, but not to my knowledge, and I often thought, since the ship has gone down, if it were possible that these could have jammed the stern plane at a down angle, if the ship were making a turn at the same time she was going on a down angle, causing the PUFF array to come over. Also, I have not seen the debris that was found, only what I have read in the paper about orange gloves and calking, and I understand there is some doubt whether this came from the internals of the ship or was something left in the ballast tanks, and I also read somewhere that they saw a lot of these orange gloves. I don't know if the record shows it or not, but all the gear for reactor compartment entry, where you find all these types of gloves, was located near that area where the PUFFS array was leaking after the shock tests.

Questions by counsel for the court:

Q. Where?
A. This is above the GSK storeroom and above the sonar room, up in the overhead is where they kept all that.

Questions by CAPT Osborn:

Q. In the midships compartment?
A. In the midships compartment. Also, on this PUFFS; on the old PUFFS we had some lines that penetrated the hull where the old arrays used to be. When I left I made mention of it and they said this was quite normal. They had one valve with a blank flange on the other side of it, and this, I understand, was in other places within the ship; the one in AMS is the only one I happened to notice; it was on the port side.

Questions by the President:

Q. That blank flange, did it have, or was it so flanged that water pressure from the outside would work against the holding bolts?
A. That's right, Admiral. There was one ball valve and approximately two inches down there would be the flange, four-bolt flange.

Questions by RADM Daspit:

Q. How large a line was it?
A. Approximately an inch and a quarter or an inch and a half line; I'm not sure of the exact size. It seemed to be about the same size that they use now in our present PUFFS system.

Questions by the counsel for the court:

Q. Can you pinpoint the location of that?
A. Yes, sir; just forward of the b(3) 10 USC 13 right underneath the ladder going down to the AMS lower level.

COUNSEL FOR THE COURT: Mr. President, I have here the exhibits of the debris that was entered in evidence. Eventually, it may be necessary to recall this witness, but I can ask him if he can identify any of the material that we have at this point, or we can treat it all at once.

PRESIDENT: Let him see what we have now. There's going to be more of the same.

NOTE: Counsel for the court showed the witness the debris entered in evidence by the court.

Questions by the counsel for the court:

Q. Tell me, whether you identify any of this material. Feel free to go through it and look at it.
A. This I can identify (referring to Exhibit 28, an orange rubber glove); this is the type we used in the reactor compartment; however, we never used anything cut off like that (indicating a frayed portion at the wrist of the glove).

Q. With a frayed edge?
A. No, ours would be a smooth edge.

Q. Does that appear to you to be damaged?
A. Yes.

Q. Referring to Exhibit 26, this has been identified as most probably being a part of a plastic valve used in processing Polaroid prints, putting the final polish on the prints; was there a Polaroid camera aboard?
A. Yes, sir, there was.

Q. What compartment would it be located in?
A. I don't know, Captain. This appears to be borated poly.

Q. Where does this appear in the THRESHER?
A. In the reactor compartment

Q. Where in the compartment?
A. In the overhead. I'm not sure exactly, but yellow poly has a certain concentration of boron in it and I would have to look on the charts to say exactly where they would use this.

Q. Would there be borated poly of this diameter and thickness?
A. I would say yes, sir.

Questions by the President:

Q. I was going to ask you if such polyethylene might be found in any other compartment in THRESHER to your knowledge?
A. Not to my knowledge, Admiral. (The witness was referring to Exhibit 21.)

The witness completed his examination of the debris exhibits without identifying anything further.

Questions by CAPT Osborn:

Q. Chief, I should think the latex gloves would be more likely to be used THAN and those you didn't identify.
A. These, sir (referring to Exhibit 20)--this might very well be, Captain, but I have never made a reactor compartment entry with the ship's reactor gear. This is what we used in the Shipyard (referring to Exhibit 28).

Q. Would it be your inference that Exhibit 28 was a Shipyard glove more likely and the latex gloves those belonging to the ship itself? Would that be your supposition?
A. I would have to suppose that if this were the type normally used by a ship. I have never seen ours, but I do positively identify Number 28 as the type used by the Shipyard, along with the crew whenever we drew out gear.

PRESIDENT: Do you have anything further, Chief?

WITNESS: No, Admiral.

The witness was warned concerning his testimony and withdrew from the courtroom.

The court recessed at 1727 hours, 18 April 1963.

The court opened at 1740 hours, 18 April 1963.

All persons connected with the inquiry who were present when the court recessed are again present in court, with the addition of LCDR Hecker and his counsel.

No witnesses not otherwise connected with the inquiry were present.

Lieutenant (b) (6) U. S. Naval Reserve, was called as a witness by the court, was warned of his rights under Article 31 of the Uniform Code of Military Justice, was duly sworn, was informed of the subject matter of the inquiry, and examined as follows:

DIRECT EXAMINATION

The witness was informed that the court was sitting with closed doors and classified information could be divulged. After testifying, he would be asked to state the security classification of items accepted in evidence during his testimony.

Questions by the counsel for the court:

Q. What is your name, rank, organization and present duty station?
A. [redacted] Lieutenant, U.S. Naval Reserve, attached to Staff, Commander Oceanographic Systems Atlantic, Norfolk, Virginia.

Q. Are you presently serving on active duty?
A. Yes, sir.

Q. Please describe the nature of your duties in your present billet.
A. The nature of duties in my present billet are Analysis Officer for Commander Oceanographic Systems Atlantic in Norfolk. Within my assigned duties are the analysis of targets which are contacted by passive means by the hydrophone arrays at the fifteen monitoring stations within the Oceanographic Systems Atlantic. I have been attached to the Oceanographic Systems Atlantic for approximately three years. The first sixteen months of my active duty were at Naval Facility, Eleuthera, Bahamas. Then I was an instructor at the Fleet Sonar School, Key West, at which I instructed in the application of the LOFAR technique, as peculiar to the Atlantic Oceanographic system. Upon detachment from there, I was transferred to Staff duty with Commander Oceanographic Systems Atlantic. I stood watches there in the form of an evaluation for the watch officer for three months, and then I was attached to the Analysis Division. I have been Assistant Analysis Officer for approximately fifteen months.

Q. With reference to your present duty, what is your educational and professional background?
A. I received a Bachelor of Arts from the University of Virginia in June of 1958, came into the service on August 25th, 1958, was commissioned on December 28, 1958, ENSIGN, USNR, and have for a little over four years been attached to the Oceanographic Systems Atlantic.

(U)

Unclassified

Q. Pursuant to your special duties, have you had occasion to compile and interpret an analysis of certain information with respect to THRESHER, the loss of THRESHER?

A. Yes, sir, I have. We have reviewed material which was submitted by various stations within the Oceanographic System and we have compared the data presented on the passive display with previously known data associated with the acoustic signature of the U.S.S. THRESHER.

Q. For the sake of the understanding of this record of proceedings by someone not wholly versed in the nature of the work you do, can you state in simple terms the general background of what you are prepared to show us?

A. Yes, sir. The passive display, which we have with us, indicates the frequencies and, consequently, the RPM's at which rotational equipment aboard the U.S.S. THRESHER operated at a period immediately prior to her loss. The records we have with us now run from 1200Z on 10 April until 2000Z on 10 April, and they show frequencies which have a high probability of being originated by rotating equipment aboard the U.S.S. THRESHER, possible b(1) , and possible signatures from the b(1)

Q. And by signatures, are you referring to characteristics peculiar to a piece of equipment?

A. Yes, sir, the characteristics which we have noted are peculiar both with respect to the RPM's and also it gives indication of the mass of the equipment which is producing this signature by the acoustic outfit that we have monitored. In addition to the possible b(1) and the b(1) signature, there was an explosion that was reported by eleven of the fifteen monitoring hydrophone arrays in the Atlantic. The location of this explosion was derived by the RCA data reduction computer at Cape Canaveral, indicates the position close to the reported position, last reported position of the U.S.S. THRESHER, within approximately ten to fifteen miles.

Q. Would the reaction of the equipment to which you are referring be the same for an ~~implosion~~ EXPLOSION as an explosion?

A. Yes, sir. The trace of disturbance that we have on the gram indicates that whatever produced it concentrated the energy in the lower part of the acoustic spectrum, principally from b(1)

Q. Would you produce the real evidence that you have brought with you?

A. Yes, sir. The first display that I have is a traced chart which displays graphically the positions which are related or derived from information that we received from the various stations and systems.

The traced chart was offered in evidence. The chart is classified b(1) The President stated that the chart would be accepted in evidence at this time, but that a substitute would be prepared leaving off any indication of b(1) The substituted chart will be Exhibit 50 and reference will be made in the record as to where the original chart may be obtained.

NOTE: The original chart will be retained by Lieutenant (b) (6) at his present station. The substitute chart is classified b(1)

Unclassified

(U)

Unclassified

Q. Will you proceed?

A. The initial detection on 10 April of a source described as part of the acoustical signature of U.S.S. THRESHER was recorded by b(1) Detection was made on the b(1) of the THRESHER, at 0915Z on a bearing of 350. This signature resembled the b(1) generated by the THRESHER and other attack class submarines b(1)

Q. Are all bearings which you are giving us True?

A. Yes, sir, they are True. The bearing determination of the System limits the actual bearing to a sector, bearing sector, which will have a determination within b(1) b(1) so the bearings mentioned are not actually the discreet single units. A triple station contact was established on this b(1) by subsequent contacts by the U.S. Naval Facility, Bermuda, on bearing 356, and also by Her Majesty's Canadian Ship SHELBURNE, the FOX ARRAY which terminates at this station. A position was established of 42° N Latitude, 66° W Longitude, with a radius of reliability of forty miles. The time of this estimated position was 101012Z. At this time and this is the corrected or absolute time, indicating an event aboard ship, b(1) source abruptly stopped, indicating termination of a possible speed run of b(1) The length of this run was eighty-eight minutes and corresponds to a nearly full power run by a submarine of the THRESHER Class. The next detection on possible THRESHER source was recorded again by the b(1) on bearing 224. The absolute event time for the previously event position was 1051Z on 10 April. Contact was maintained on this source for four minutes. Contact was then lost at 1055Z. At 1121Z, again corresponding to time aboard the ship, contact was gained on a b(1) of the U.S.S. THRESHER on bearing 215 from FOX, corresponding to a speed of advance of b(1) for THRESHER Class submarines. This source indicated an RPM change at 1126Z, a very minor change, indicating a drop in speed to approximately b(1) The source then diminished in strength and continued to run, point of diminution 1207Z. However, contact was maintained until approximately 1250Z; then it was lost. Contact faded out, indicating a loss of transmission rather than an actual ending of the equipment RPM aboard the vessel. The next contact was also gained by the FOX ARRAY at SHELBURNE corresponding to an absolute event time of 1237Z, the signatures believed to have been generated by the **b(1)** aboard THRESHER. The signature corresponded to those previously noted for THRESHER when the **b(1)** Again, initial contact time 1237Z. Contact was maintained on this equipment until 1411Z, when contact was lost with an abrupt stop. There is some indication on the LOFARGRAM that the equipment, rather than coming to an abrupt halt slowed very slightly in RPM's, and then contact was lost.

Unclassified

Question by RADM Daspit:

Q. 1411?

A. Yes. 0911R. This was the last contact that any station in the system had on b(1) signature components aboard the U.S.S. THRESHER At 101418.1Z an explosion occurred, or I will correct that to say that an acoustic disturbance occurred in the position (b) (1) (A), (b) (1) (B) (b) (1) (A), (b) (1) (B) The reliability of this explosion, or rather the solution of this explosion run by (b) (1) (A), (b) (1) (B) indicates that there are two axes associated with it; the major axis runs on approximately (b) (1) (A), (b) (1) (B) The minor axis has a length of (b) (1) (A), (b) (1) (B) . We may say that there was a high degree of probability that the explosion occurred within these parameters. This explosion was monitored, or disturbance was monitored by (b) (1) (A) within the Oceanographic System. The explosion monitored by each one of the ARRAYS is definitely associated with the disturbance that took place in this area. The explosion by nature, or again allow me to correct myself, the disturbance by nature was of extremely low frequency predominating in that portion of the spectrum (b) (1) (A) At this time, sir, I think it might be best to introduce some of the actual grams.

(b) (6) ; was relieved by (b) (6) as reporter.

By Counsel for the Court:

Q. You have made several references to the U.S.S. THRESHER, and you have said that there is a high probability that the data which you have recorded and charted emanated from THRESHER. What is the degree of that probability that the information which you have given us related to the U.S.S. THRESHER?

A. On what basis--in what terms?

Q. On the basis of a 100 per cent scale, or would you prefer to use adjectives?

A. I think I can convert it pretty well to percentages, since, within our system, we establish reliability on the basis of 1, 2 and 3 - 1 being the highest figure to which we assign reliability of these contacts. Reliability 1 is accurate approximately 90 per cent of the time. I can convert it based on the nature of the display on the lofargrams emanated by THRESHER here in the past and by other members of the nuclear submarine fleet which have similar apparatus. With reference to the first contact. b(1) operating at approximately b(1) there is a 90 per cent probability that THRESHER was the acoustic source of this signature. With relation to the first contact on the b(1) I would say that the reliability is 70 to 80 per cent. The b(1) detection at (b) (1) (A), (b) (1) (B) corresponding to the previously stated figure of b(1) I would place a 70 to 80 per cent reliability on this figure. With regard to the last detection on the b(1) this is perhaps the most reliable signature we have, and this comes into the 90 per cent category. Again, this corresponds extremely well with the appearance on the lofargram with operating RPM with harmonic predominance of the signature as compared with previous detection on this source

Q. How many previously noted signature sources did you have on THRESHER?
A. From the whole acoustic signature?

Q. Of the ones you are using here. How many of these acoustical signatures have you been able to compare with those emanating from THRESHER in the past?
A. All of them, sir. We have previously noted the b(1)
b(1)

Q. Would operational time of the submarine and the equipment and possible repairs and upkeep affect the signature rate to lower the probability?
A. Yes, sir, it could. I think that subsequent testimony on this particular point by Captain Leehey and Mr. William Barnes and Mr. (b) (6) will bear on this point. I do not think, from the information I have seen on this subject relating to previous acoustical levels, that there is a difference which would invalidate the reliability of the signatures which we have recorded here.

Q. Can you differentiate in the equipment which you are using among an implosion of an air cylinder, an explosive charge, and a steam explosion?
A. No, sir. We can only say that the disturbance which we monitored was of an extremely low frequency output, and we can compare these with such devices as the b(1) , which display high frequency components and are monitored for an extremely limited period of time, up to a half or three-quarters of a minute.

Q. Can you identify hand grenades thrown into the water?
A. We could identify it as an acoustical source, but could not specifically say the source of disturbance was a hand grenade.

EXAMINATION BY THE COURT

Questions by a court member, CAPT Nash:

Q. I would like to ask about the accuracy of the times here. You mentioned 1718 as the time that this disturbance occurred - 1718.1.

PRESIDENT: No, that was 1418.1.

THE WITNESS: It's 101418.1Z.

Questions by a court member, CAPT Nash:

Q. That's the time I'm talking about. What was the degree of accuracy of that time? I recognize from the stations there are variations in the water conditions, and so forth. What is the accuracy of the times?
A. I would say that the accuracy of the time is within 12 seconds.

Q. There is quite a discrepancy between the two positions there, one by bearing and the spot where you have located the disturbance.
A. Yes, sir.

(U)

Unclassified

Q. Can you explain that difference in any way? The ship could not have been in both of those positions.

A. No, sir. We discussed, first of all, the reliability of the bearings which are displayed on the passive sonar gear in the system. As I stated previously, the bearings derived are not discreet bearings. They have a plus or minus factor. Also affecting the accuracy of the bearing is the fact that the source may appear on more than one display which covers a bearing sector. Other things affecting bearing accuracy are the intensity of the trace on the paper, which may cause a diminution of the signal, which might cause it to appear weaker. It is possible that the

b(1)

We have noted this in the past. Usually we are more accurate, but we can say that we could be off by that much. Ascribing a reliability to the position derived, we could say this is probably far more accurate than the bearing which the FOX array determined. Incidentally, the bearing reported by the stations confirmed this position roughly. Our first message gave a position which was only 13 miles in error. This last position is arrived at by a time difference converted to a distance difference. Instead of having one monitor source, we had eleven. So that any error by any one of the reporting stations with regard to disturbance time tends to be canceled out by the other stations. Consistent with this, I should like to introduce--I'm not sure whether you want to introduce this or not.

Questions by Counsel for the Court:

Q. Do you have any data which would indicate a disturbance caused by air blowing?

A. I might state that a Canadian officer attached to our staff in Norfolk has noted an 'A" class submarine blowing tanks 100 miles from this array. This was correlated with the actual event aboard the submarine. The gear is sensitive enough, but you could not identify it other than an acoustic disturbance. (The witness produced a paper in his possession.) The times indicated here are the times reported by the stations. We were working on the solutions that we first came up with within our system ourselves prior to the RCA computer computations. We assumed a position where we were able to determine a position of 41° 45' North, 65° West. Working on this as a source position for the disturbance, we then calculated the acoustic sound travel time to the station and subtracted that from the reporting time. You should have a fair degree of correspondence, and the corrected times down here indicate that it definitely occurred in this area, at 65° West, 41° 45' North.

Q. Can you make some sort of a mark on the chart?

A. (The witness complied.) This was our initial computation for the acoustical disturbance. As I said, there was a 13-mile error. We know it is now in error by 13 miles. which is not too much considering the distance. We found that the times came out remarkably even. You have signatures such as b(1) It is definitely of common origin. The computer definitely associated a common source to this disturbance and placed it in the position previously described.

Unclassified

COUNSEL FOR THE COURT: Counsel offers in evidence the working paper from which the witness is now reading.

PRESIDENT: What is its classification?

THE WITNESS: It should be classified (U)

The said paper was submitted to the party, LCDR Hecker, his counsel, counsel for the party, RADM Palmer, and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence and marked "Exhibit 51."

By Counsel for the Court:

Q. Do you have in your possession a lofargram from the Shelburne Station, the FOX array?

A. I have.

COUNSEL FOR THE COURT: Counsel offers in evidence this lofargram.

The said lofargram was submitted to the party, LCDR Hecker, his counsel, counsel for the party, RADM Palmer, and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence and marked "Exhibit 52."

By Counsel for the Court:

Q. Tell us what Exhibit 52 is, please.

A. Exhibit 52 displays the monitor of station FOX in Shelburne, Nova Scotia b(1) from the time period 101200Z to 102000Z April. Our first interest on the gram is the presence of the possible second b(1) generated by THRESHER at b(1) We can note here that the pattern is typical of b(1) The signature is reasonably intense and discernible at approximately 1207Z. It diminishes in strength--and this is consistent with a possible change in aspect by the submarine, which is generally a function of aspect. The signature continues with diminished intensity to approximately 1250Z on the 10th, when contact is lost. Again, this does not indicate a stoppage of equipment, but rather the equipment was no longer able to monitor the source. Prior to that time, at 1237Z a signature was gained which strongly resembles the signature of b(1) aboard THRESHER class submarines. The appearance on the gram, b(1) are extremely similar. This runs with the b(1) b(1) and frequency corresponding to the b(1) b(1)

EXAMINATION BY THE COURT:

Q. (By court member, CAPT Osborn) I think you ought to point out the significance of the b(1) Is there anything peculiar about this?

A. Yes, sir. This is one of the few pieces of equipment aboard any vessel--As a matter of fact, to my knowledge, it is the first time that we have picked up b(1) from an acoustical source, when they were not reinforced by other equipment associated with the main source, and this is peculiar to the b(1) aboard this class vessel.

Questions by the President:

Q. Will you explain what is meant by the term b(1)

A. Yes, sir. The b(1) is determined by the operating b(1) of the source involved, and at this time the source was operating at approximately b(1) which is consistent with the b(1) previously noted. The frequency generated by the b(1) appears on the gram with its proper characteristics. There also appears a second trace corresponding to the b(1) from the source. Exactly why this appears as b(1) I'm not sure, and I recommend that the board interrogate Mr. William Barnes on this.

Q. In simple terms, it is not unlike the ghost that you get in radar operations, is that correct, at double the distance, or half the distance from you? Are you familiar with ghosts in radar?

A. No, sir.

Q. Very well.

A. The signature of the possible b(1) runs on the lofargram displayed as Exhibit 52 until 1014.12Z, which corresponds to an event aboard the submarine, at the indicated distance, of 1411Z. At this time the signature comes to a halt with a possible indication--certainly not as reliable as the main signature--as b(1) a very slight trail-off. This signature is a disturbance to the equipment, from here down to here (indicating on lofargram).

COUNSEL FOR THE COURT: Could you mark that spot with the letter "A."

THE WITNESS: Yes, sir. (The witness complied.) This would be the b(1) and there appears to be a slight trail-off. Other sources appear on the gram not being associated. Its appearance right here at the end of the strong source gives an indication of possible drop-off of the operational b(1) However, I have been informed there again, that--Well, I would recommend that Mr. Barnes be asked whether the nature of this equipment is such that the b(1) would last as long as a minute and a half. It is my experience that it probably would not. The mass of the equipment involved would permit a sudden drop in b(1) rather than an b(1) sustained for a minute and a half. That is why I speak of it as having a low reliability.

Questions by the President:

Q. Is the distance from here to here (indicating on Exhibit 52) a minute and a half?

A. Yes, sir--between a minute and a half and two minutes. So the actual drop-off is a minute and a half to two minutes. This is the last positive, or rather strong, indication of acoustical generation by equipment aboard the THRESHER. The next signature which is tied in is an acoustic disturbance noted at 101418.7.

By Counsel for the Court:

Q. Is that marked "EXP" in red on your chart?

A. Yes, sir. It is the initial blast of energy. This acoustical disturbance is of extremely low energy.

By the President:

Q. Low frequency?
A. Yes, sir, excuse me, and is concentrated considerably below
b(1) The strong output is probably between b(1)
the reverberation from this explosio continues approximately two or three minutes, followed, approximately four minutes later, by another lower level acoustical disturbance, and a minute and a half later than that, another one.

Q. (By counsel for the court) And that is marked "B" and "C" on your chart?
A. Yes, sir. (The witness then produced another lofargram). This is an accoustical disturbance which ~~which~~ was monitored by b(1) and I should like to recommend the introduction at this point of this gram

COUNSEL FOR THE BOARD: Counsel offers this in evidence.

The said lofargram was submitted to the party, LCDR HECKER, his counsel, counsel for the party, RADM PALMER, and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence and marked "Exhibit 53."

Q. (By counsel for the court) Referring to Exhibit 52, will you explain to someone reading a narrative how to determine the sequence of events on this exhibit?
A. Yes, sir. The lofargram first of all, displays the energy monitored by the hydrophone from b(1) These are 10 marks, and they appear every hour on the hour and establish the determination of the hour.

Q. Those are the vertical lines across the page at a point marked "X" and represented by dark dots three-quarters of an inch apart?
A. Yes. Subsequent to the appearance of calibration marks, a Roman numeral code is inscribed which tells what hour the calibration appeared. The large block is units of 10. The extremely narrow one is in units of one. The next size of importance is in units of 5.

Q. And those appear on the margin opposite to the one where "Exhibit 52" is marked, is that correct?
A. Right. The first mark appearing in the right-hand margin of Exhibit 52 after the hour code marks the point which is 10 minutes after the hour. No 5 minute mark appears there because it may interfere with the inscriptions of the hour code, and evenly, at 5-minute intervals another mark appears all the way down to the next hour.

Q. Proceed, please.
A. Exhibit 53 is a lofargram from the northern array at U. S. Naval Facility, Bermuda, again for the period 101200Z to 102000Z. The only signal appearing on this gram which corresponds to those exhibited by Exhibit 52 is the explosion of acoustic disturbance which appears on this gram, Exhibit 53, at [illegible]. This corresponds remarkably well with the acoustic signal received at FOX plus the sound travel time of (b) (1) (A) (b) (1) (B)

Q. This is indicated by the abbreviation in red "Expl"?
A. Yes, sir. The difference between these displays is attributed to the gear. The narrower gram, Exhibit 53, is an ANFQQ1V sonar display, a display from (b) (1) (A) cycles. The FOX display is the new digital spectrum analyzer exhibiting b(1) on a wider display. The nature of the explosion on Exhibit 53 is quite similar to that of Exhibit 52, the FOX gram. When you consider the difference of displays, the energy of Exhibit 53, the lofargram, is extremely low in the acoustical spectrum, predominating in the b(1) range. It is severely attenuated above b(1) and is very definitely of the same origin as the FOX display. Exhibit 52. As previously stated, this acoustic disturbance was monitored by b(1) within the Oceanographic Systems, Atlantic. The reverberations on Exhibit 53 correspond in time period and in general intensity to those noted on Exhibit 52, the FOX gram.

Q. Do you have another of these in your possession?
A. I do.

Q. Produce it.
A. Here it is.

The said lofargram was submitted to the party, LCDR Hecker, his counsel, counsel for the party, RADM Palmer, and to the court, and was offered in evidence by counsel for the court. There being no objection, it was received in evidence and marked "Exhibit 54."

Q. Would you describe that for the record?
A. Exhibit 54 is another lofargram from station FOX, from an adjacent bearing and displays of interest a signature which appeared on the lofargram at 101416Z, approximately 2 minutes prior to the explosion previously described as originating in the THRESHER area. The signature bears some resemblance to an b(1) aboard the THRESHER. However, at this point I should like to defer to more knowledgeable people in this regard, such as Captain Leehey and Mr. Barnes. The signature runs for approximately 20 minutes, at which time it abrupts out. The nature of this signature indicates it is a regained contact on an acoustic source which ran from 1012000Z to 101300Z approximately. The personnel at the FOX station classified this signature as originating from a fishing vessel. It is compatible with a 4-cycle diesel propulsion contained aboard many fishing vessels which operate in the area, and again as to its possibility of being possible THRESHER propulsion, I should like to defer to Mr. Barnes. The acoustic disturbance noted on this gram at 1418.7Z is the same as noted on Exhibit 52, and shows that the disturbance was sufficient to overload the equipment, thereby not showing its true intensity. This intensity is more clearly displayed by the fact that b(1) did monitor it. Of possible interest on Exhibit 54 is another low frequency disturbance noted at approximately 1506Z. This disturbance was not monitored by other stations within the system. However, it displays a similar pattern to the explosion which occurred at approximately 1418Z. I will say one additional thing here: Based on previous experience, I think that the impact of a submarine hull upon the bottom within 50 miles of FOX area would have been picked up. I think the mass involved in the actual impact would have been monitored, but I do not consider myself qualified to say at this point that submarine impact is the source of the 1506Z disturbance on Exhibit 54.

Q. Who would be qualified to express that?
A. I think the best way to determine the possibility of that is to somehow determine the "sink" rate.

By court member, RADM Daspit:

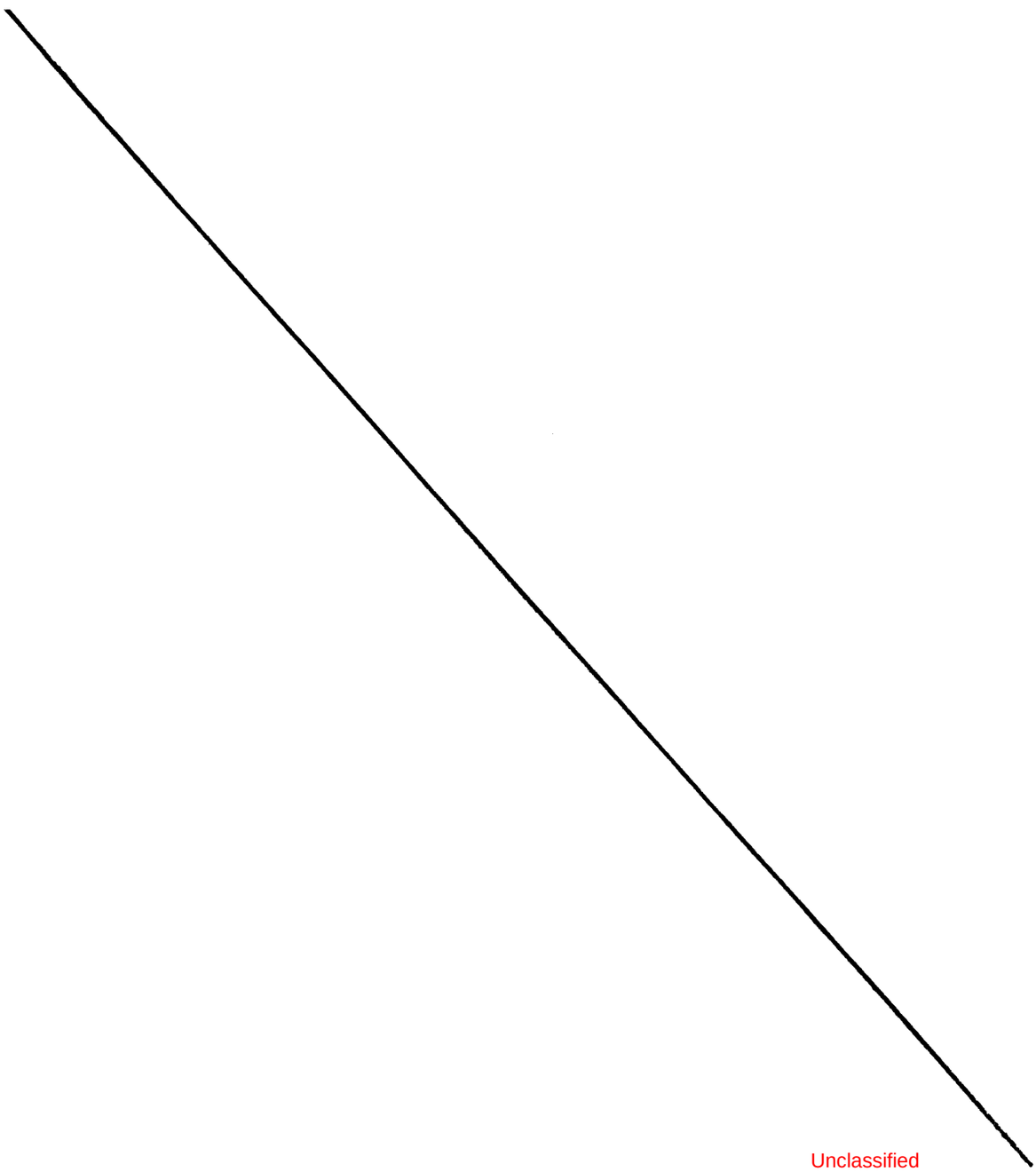
Q. What is this here on this gram?
A. On Exhibit 52- and very faintly on Exhibit 54- is an acoustical disturbance which is noted at 1415Z, which would correspond to an event which occurred in the position of THRESHER at 1414Z, and I really do not feel qualified to say positively whether it was in fact a submarine blowing tanks.

By court member, RADM Daspit:

Q. What was the duration of that?
A. It is less than a minute- considerably. I would say probably in the area of 30 seconds.

By counsel for the court:

Q. Could it be a trace indicating air being blown?
A. Yes, sir, that could possibly be the origin.



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Neither counsel for the court, the court, the party, LCDR Hecker, nor counsel for RADM Palmer desired to examine this witness further.

The president informed the witness that he was privileged to make any further statement covering anything related to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness made the following statement: "The highest classification of the material which I have presented is (b) (1) (A), (b) (1) (B)

The witness was duly warned concerning his testimony and withdrew from the courtroom.

Unclassified

(b) (6) relieved (b) (6) as reporter at this point.

Patrick Leehey, Captain, U. S. Navy, was called as a witness for the court, was duly sworn, was warned of his rights under Article 31, Uniform Code of Military Justice, informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, rank, organization and present duty station.
A. Patrick Leehey, Captain, United States Navy, Bureau of Ships Applied Sciences Division.

Q. State the nature of your duties in the Applied Sciences Division?
A. I am the Head of the Ships Silencing Branch. My duties are to supervise research and development programs and noise reduction on naval vessels, and the acoustic and vibrations measurement program for the Bureau of Ships Applied Sciences Division.

Q. What is your professional background and experience in this particular field?
A. My formal educational training? United States Naval Academy, and I have a Doctorate in Applied Mathematics from Brown University. I have been assigned on hydromechanic studies at the David Taylor Model Basin for three years and in my present capacity for a period of four years.

Q. In this closed session of the Court of Inquiry, Captain, classified information material to the inquiry being conducted may be divulged. I shall ask you at the end of your testimony to designate the highest classification of any information which you have given in here during this session of the court. I would also ask, to assist the reporter, that if you refer to scientific terms not in ordinary parlance, you assist him by spelling them for the record. Do you have information to give us, Captain, with relation to exhibits now before this court?
A. Yes.

Q. I would prefer that you present the information in the way in which you have organized it. You may present it.
A. My information relates to the identification of acoustic records on the exhibits before the court.

WITNESS: Has this been identified as an exhibit?

COUNSEL FOR THE COURT: This is Exhibit 53.

The witness continued his answer, as follows:

A. I have conducted an analysis of the exhibits and correlated it with previously acquired acoustic data on the U.S.S. THRESHER. The exhibit reference that I would speak of is the initial detection of the U.S.S. THRESHER at the time of 0846 ZULU which does not appear on these exhibits, but in accordance with the tellers studied corresponds to the b(1) of the U.S.S. THRESHER proceeding at maximum speed. The termination of this particular line is at the period 1012 ZULU, with the geographical fix attained by the (b) (1) (A), (b) (1) (B) of 42 degrees North, 66 degrees West. This

confirms, in my opinion, a logical detection of the U.S.S. THRESHER. The frequency corresponds to the operation of the ship at maximum speed and the known acoustic levels of the ship at this speed are adequate to provide a detection in this area. The second reference is, again, to tellers, corresponding to a frequency of b(1) which appeared at 1051 ZULU and terminated at 1055 ZULU. The times I am giving are corrected for the transmission speed of sound.

By a member, CAPT Nash:

Q. May I ask what we mean by "tellers"?

A. A teller is a card report which is transmitted by dispatch from the receiving station giving the key information of their investigation of the Lofargrams on record at the station.

The witness continued his answer to counsel's question, as follows:

A. This particular line corresponds to the b(1)
The third reference is to a frequency starting at b(1) cycles at the hour 1121 ZULU, shifting to b(1) cycles at the hour 1126 ZULU. This line appears upon Exhibit 52. The line weakens in character and terminates at the hour of 1250 ZULU. This corresponds to the second harmonic of b(1) The weakening of the signal is probably due to an aspect change of the ship. Based upon acoustic data obtained by the David Taylor Model Basin after the shock trials of the U.S.S. THRESHER but prior to her post-shakedown availability, the strength of this particular signal was high on bow aspect and somewhat weaker on stern aspect but of adequate strength to have produced the line at the approximate range to the reporting station. This data is also corroborated by tests by the Engineering Experiment Station prior to the post-shakedown availability but after the shock trials against the Atlantic SOSUS System. I refer next b(1) commencing at 1237 ZULU as detected by the nearest SOSUS Station. These correspond to the b(1)

on the U.S.S. THRESHER. In this respect I have reviewed two sets of acoustic data taken by the Portsmouth Naval Shipyard at the Overside Test Facility on b(1) of the U.S.S. THRESHER. One set of data was taken for the period 1 to 3 April 1963 and gives the overside acoustic levels of the b(1) The other set of data was taken at the Portsmouth Overside Facility in August -- excuse me, correction -- on September 12, 1962, and is data taken of the b(1) of the U.S.S. THRESHER b(1) . There was no data taken of the b(1) during the 1 to 3 April 1963 period. However, to the best of my determination, there was no change to the b(1) during the post-shakedown availability. The individual operation of the b(1) do show line component character to the b(1)

However, the overside acoustic levels of the b(1) is very high and one would expect that if the b(1) would have appeared. It does not appear on this record. I wish to amplify; it does not appear on the exhibits before the court.

By the president, VADM Austin:

Q. A question by the court, Captain. Would this seem to indicate that the b(1) ?

A. Yes, sir.

Q. You said it did not show the third line and that if it had been b(1)
it should have showed the third line; therefore, in the absence of the third line it is implied by your testimony, as I interpret it, that the b(1)
Is that a proper deduction?

A. Yes, sir.

The witness continued his answer, as follows:

A. The Portsmouth overside data taken on 7/12/1962 further supports this conclusion. b(1)

I refer next to a line appearing -- I must make sure of my exhibit -- on Exhibit 52 at a frequency of b(1) commencing at -- may I correct -- I do not specifically know the commencement time. The termination time is 1250 ZULU. This line could correspond to the b(1) of the THRESHER b(1) from data taken on the 1 to 3 April overside tests by the Portsmouth Naval Shipyard.

By the president, VADM Austin:

Q. You said, Captain, "could". Now how much reliance could be place on the probability of its being that particular b(1) "Could" is very broad. Now is it just barely possible, is it highly probable; give us a field for what "could" means in this case.

A. The b(1) capability of operation. On the overside test it showed abnormally high overside level, in my opinion, adequate to have been detected. Previous acoustic trials of the U.S.S. THRESHER, however, have also exhibited a line attributable to the b(1) but not identifiable to a specific b(1) . This is another possibility.

Q. You aren't going to tell me, huh?

A. That is the best I can do, sir.

PRESIDENT: If you do your best, that's all we can ask.

The witness continued his answer, as follows:

A. I refer next to the b(1) appearing on Exhibit 52, which terminate abruptly at 1411 ZULU. I have already expressed my firm belief that these are b(1)

By counsel for the court:

Q. Captain, at the estimated range of THRESHER from ARRAY FOXTROT, would you expect to obtain a signature from the b(1) if they were at b(1)

A. Emphatically, no.

The witness continued his basic answer, as follows:

A. I refer next to a line component appearing on Exhibit 52 at b(1) which appears on the period at least from 1200 ZULU to 1441 ZULU. In the trials of the U.S.S. THRESHER in the period August, 1961, line components at b(1)

were identified with the U.S.S. THRESHER. The same frequencies were determined to exist in the vibration measurement b(1) There was no established identification for the source of these lines nor did they appear in the subsequent detection trials of the U.S.S. THRESHER prior to the post-shakedown availability. They have not appeared on the U.S.S. PERMIT, a sister ship of the U.S.S. THRESHER. I do not believe that the line appearing on Exhibit 52 is associated with the U.S.S. THRESHER.

By a member, CAPT Hushing:

Q. Is it possible that a change in the b(1) if you want to talk of it that way, -- between the b(1) could have so changed the characteristics of the mounting system as to cause this line to be a new line?

A. I would consider this unlikely. The isolation mounts of b(1) of the U.S.S. THRESHER are nominally b(1) mountings. One could conjecture, although we have no evidence to support this, that the earlier appearing b(1) lines were associated with the b(1) If this were so, I do not feel that a change in the coupling would exceed the range at which the mountings would provide essentially b(1)

By a member, CAPT Nash:

Q. I understood you to say that this trace ran into 1441; did you mean 1414?

A. 1441, as I stated.

The witness continued his basic answer, as follows:

A. I refer next to a heavy blast in low frequency energy over approximately three minutes duration appearing on Exhibit 52 at the time 1418 ZULU. It is followed by a smaller blast at 1425 ZULU, and a second smaller blast at approximately 1427 ZULU. The initial heavy blast appears also on Exhibit 54 and Exhibit 53. Exhibit 53 has the coverage b(1) and at approximately four cycles per second a very heavy low frequency line is clearly evident. The initial blast persists across the entire frequency band of the records to b(1) and on the records from the nearest ~~IOSAS~~ Station there is an evident overload of the hydrophones indicating that it is of substantial intensity. I have associated in my own mind this blast with the U.S.S. THRESHER.

WITNESS: May I ask a question of the counsel at this point?

COUNSEL FOR THE COURT: Yes.

WITNESS: My assignment by this court was to conduct an investigation in participation with the Commander Ocean System Atlantic. I feel that in this respect the exact identification of times and locations are the work of the staff of Commander Ocean Systems Atlantic. However, I have personally reviewed all of the data delivered with respect to it and concur completely in their analysis. I'm sorry, I turned that question into a statement.

PRESIDENT: Yes, you did. That's all right, put it on the record that way.

COUNSEL FOR THE COURT: I was trying to compose an answer.

PRESIDENT: He really had you thinking.

WITNESS: Sorry, Admiral, I found another way to put it into a statement.

PRESIDENT: Good, good. You'd be surprised how many questions do turn into statements.

The witness continued his basic answer, as follows:

A. I note at the time 1505 ZULU on Exhibit 52 an acoustic blast of weaker intensity of approximately six minutes duration. I refer next to Exhibit 54. From the nearest SOSUS Station, (b) (1) (A), (b) (1) (B) there was a teller report at 1121 ZULU of a contact with b(1) spacing. This contact was reported to fade out at 1249 ZULU. At 1416 ZULU on Exhibit 54 there was a knee start -- that is a start with an increasing frequency -- of a target which produced identifiable lines at b(1) There appear also at the period of the start, four lower harmonics of somewhat uncertain frequency origin. The spacing on these lines, accounting for reading errors, is b(1) corresponding to the spacing of the earlier identification. These lines persist until 1437 ZULU and terminate with an abrupt stop. In the post-shock trials of the U.S.S. THRESHER, the emergency propulsion motor on battery on their test conducted by the David Taylor Model Basin showed line components of the emergency propulsion motor of b(1) The source level of a line component at b(1) was sufficiently high to have been detected by the nearest SOSUS Station; however, their records do not extend beyond b(1) I considered this as an outside possibility of the starting of the emergency propulsion motor on THRESHER at this particular time. It is more likely, in my opinion, that it is an ironic coincidence. The b(1) line appearing upon Exhibit 54 was not determined during the David Taylor Model Basin trials of the emergency propulsion motor. This concludes my direct testimony on the subject.

EXAMINATION BY THE COURT

Questions by the president, VADM Austin:

Q. Captain, do you have a chronology of what you have told us in writing?
A. Yes, sir.

Q. Could you make it available to the court at this time?
A. Yes, sir.

Questions by a member, CAPT Osborn:

Q. Captain Leehey, with respect to collapsing of the hull, weighing the basic strength involved, do you think that in any spectrum of a hull collapse it could be likely to fall in the lower frequency bands, from, say b(1)
All I'm really trying to say is, would you think that this is a reasonable assumption without tests or from a technical point of view?
A. I would expect a concentration of energy in the low frequency spectrum.

REDIRECT EXAMINATION

Questions by counsel for the court:

Q. Can you provide an estimate of the time intervals between the three

b(1)

CAPT OSBORN: He had it down; it's in the testimony.

PRESIDENT: It's in the testimony and also in the tapes here. Anything further, counsel?

COUNSEL FOR THE COURT: No, sir.

CROSS-EXAMINATION

Questions by LCDR Hecker, a party:

Q. Captain, I'd like to ask you if, as a result of your analysis, you have an opinion regarding the speed of the THRESHER at any times during the period she was under observation by the net?
A. Yes, sir. I have stated two times in my testimony.

Q. Yes. Now I would like to ask you, do you have an opinion regarding the speed of THRESHER at 1335 ZULU?
A. No, sir.

Q. 1353 ZULU?
A. No, sir.

Q. 1402 ZULU?
A. No, sir.

Q. 1412 ZULU?
A. No, sir.

Q. Captain, you have stated that on Exhibit 52 from time 1200 ZULU to 1441 ZULU you had lines at b(1) which were identical to those lines which had previously been determined to exist in certain vibration tests, and your observations thereof in the b(1) and then you concluded that even though these lines appear on Exhibit 52 that they are not associated with the THRESHER. What is the basis for that conclusion?
A. First, the strength of the lines in the vibration spectrum was not high. Secondly, the lines were not determined on the trials of the U.S.S. THRESHER subsequent to her shock tests and have not been determined on a sister ship of her class. My conclusions are also based upon the persistence of this particular line past the explosion point for a period of twenty-three minutes.

Q. And you are not prepared to conclude from your studies to date that the time, 1441 ZULU, would possibly represent the time at which THRESHER came to rest on the bottom?
A. I do not feel qualified to draw such a conclusion at this time.

Q. Captain, directing your attention now to your testimony regarding Exhibit 54, initial time 1121 ZULU when contact was first made with b(1) b(1) in your testimony you traced that down to time 1437 ZULU and stated that lines terminated with an abrupt stop. Then in your testimony you talked of these lines being similar to those previously observed in connection with the start of the emergency propulsion motor on battery; and then you said, "However, I consider this to be an outside possibility of the starting of this motor. It's more than likely an ironic coincidence." Now, if we are to believe anything from this data I would like you to explain that "more likely an ironic coincidence." It seems to me that in your testimony you went down there very logically and it indicated to me that you were going to conclude that this was, in fact, the start of the emergency propulsion motor on the battery, but then you destroyed it. Now could you explain to the court your reasons for categorizing this as "more likely an ironic coincidence"?

A. Yes. My reasons are based upon the progress of my investigation into this matter. I initially discarded these from consideration completely as being typical of some other target in the area. It was only upon a reanalysis of the David Taylor Model Basin data and the noting of the appreciable increase in emergency propulsion motor acoustic level on the THRESHER after shock trials that I gave serious consideration to the sequence of these lines. But, in final conclusion, the absence of a high acoustic level of b(1) b(1) and the complete absence of any identification of b(1) by the David Taylor Model Basin, coupled with the continued persistence of these lines past a point of heavy acoustic blast, has led me to my conclusion.

Q. Well then, also from your testimony, are we to conclude that all energy sources of any type observable by the SOSUS net ceased at 1411 ZULU? Your testimony there, to refresh your memory, is that you detected the b(1) they terminated abruptly at 1411 ZULU. And then in your testimony there is no other disclosure of energy sources being observed.

A. Excuse me --

Q. Other than your b(1)

A. Admiral, I intended that this was the end of what I felt to be the pertinent data with respect to THRESHER. Upon reviewing my notes I call attention to a line which had the appearance of b(1) substantially later in the record. I'll have to sight the lofargram by eye completely before I can answer that. There is an extremely weak appearance of a li... at approximately b(1) from the period 1447 ZULU to the period 1606 ZULU. I do not believe it is properly on frequency to correspond to a b(1) Its weakness is very marked; it makes it difficult to determine the existence of a line at all and it is not accompanied by a line at (b) (1) (A), (b) (1) (B) which we would expect to see if this were the continued operation of a coolant pump. I note further that this is after the period of the very severe acoustic disturbance. I might make a remark in this respect. In the analysis of this type of data it is possible to see lines that are not really there if one looks long enough.

Q. Captain, with regard to the acoustic disturbances that you have testified to appearing on Exhibits 52, 53 and 54, are you qualified to classify those as to the collapse of a bulkhead, the expulsion of air under high pressure, or how would you classify them, if you are qualified to do so?

A. I do not consider myself qualified at this time.

(U)

Unclassified

REEXAMINATION BY THE BOARD

Question by a member, CAPT Osborn:

Q. I have one more question I'd like to ask. With respect to the range from ARRAY FOX and known b(1) of THRESHER, what is the b(1) in their correlation that you think that you would be able to detect on ARRAY FOX?

A. I should remark that it is at least as likely that one of the (b) (1) (A), (b) (1) (B) would obtain a detection on b(1) as early, or perhaps earlier, b(1) (b) (1) (A), (b) (1) (B)

Q. A minimum?

A. I would state that if the ship were b(1) at any of the stations.

Q. I'd like to emphasize that if you can, in retrospect, if you can come up with some idea of this, that this, the particular speeds involved, the maximum that might be obtained, might be extremely important with respect to any subsequent correlation.

A. We have data on the detection of b(1) by the southern SOSUS stations when the ship is relatively close aboard that is of the same order of range as Station FOX was to the position we are speaking of here. If one were to accept this data as applying to FOX, one would perhaps set the speed somewhat lower; however, the conditions, in my opinion, for detection by FOX, being on terminal bearing condition and near the shoaling of the Continental Shelf but not in an acoustically favorable direction, would not render such a conclusion, in my opinion, valid.

Neither the counsel for the court, the court, nor any of the parties desired to examine this witness further.

The president of the court informed the witness that he was privileged to make any further statement covering anything relating to the subject matter of the inquiry that he thought should be a matter of record in connection therewith, which had not been fully brought out by the previous questioning.

The witness stated that he had noting further to say.

PRESIDENT: Now I would like to remind all present that everything regarding the SOSUS System is highly classified and that no notes taken on this testimony should be taken out of this room unless they are properly stowed in a safe that is proper for b(1) material. Counsel will be kind enough to take care of the notes for you and return them to you.

WITNESS: The highest individual classification is b(1)

PRESIDENT: But this right here (referring to Exhibits 50, 51, 52 53 and 54) and some of the things that have been said orally are b(1)

PRESIDENT: All right, gentlemen, at long last we'll adjourn. We will meet tomorrow morning at nine o'clock in closed session to continue the testimony.

The court adjourned at 2005 hours, 18 April 1963.

Unclassified

SEVENTH DAY

Portsmouth Naval Shipyard
Portsmouth, New Hampshire
Friday, April 19, 1963

The court met with closed doors at 0905 hours.

All persons connected with the court who were present when the court adjourned were again present in court except (b) (6), who was relieved by (b) (6) as reporter. In addition, RADM C. J. Palmer, party, was present.

No witnesses not otherwise connected with the inquiry were present. Mr. William H. Barnes, III, civilian, was called as a witness for the court, was duly sworn, was advised of his rights against self-incrimination, informed of the subject matter of the inquiry and examined as follows:

DIRECT EXAMINATION

Questions by counsel for the court:

Q. State your name, address and present occupation.
A. My name is William H. Barnes, III. My address is (b) (6) (b) (6) and I am a Marine engineer employed by the U. S. Naval Engineering Experiment Station, Annapolis.

Q. At the Experiment Station in Annapolis, what are your assigned duties?
A. I am assigned as head of the field trials branch in the ship silencing division, and additionally I have been appointed--approximately three years ago--as the BuShips technical director for detection trials for submarines.

Q. In very brief explanatory statements in layman's language, could you explain the gist of your functions in that job?
A. I think a good way to explain this would be to say that I can take you through a typical trial situation. Normally the Bureau of Ships would inform us that we were to do an acoustic trial for a particular submarine commencing on a certain date. The submarines we have been doing in the last three years have been almost exclusively nuclear. We would confer with the ship and the yard, if there was a yard in the case-as to what we intended to do during the trial, to obtain the ship's acquiescense in what we were going to do to see if it was feasible engineering-wise. We would then go back to our laboratories and write an agenda for the trial.

Q. Well actually, will you just tell us what the trial is that you perform and what you do with the results of it so we will have an understanding of that?

A. All right, sir. During the trial I am in charge of a structureborne noise group which rides the boats during trials in Tongue of the Ocean, ~~whereever~~ the trial may be held, there or on the west coast. We then, on completion of Tongue of the Ocean phase, go into a detection trial at which time I will be at the Island of Eleuthera.

Q. Not so much where you were as to what sort of data you get and what you do with it.

A. I am sorry if I am not getting precisely to your point, but during structureborne noise trial you get vibration levels of each individual machine aboard the submarine both main propulsion and auxiliary equipment under varying conditions of ship speed and depth. During the detection trial you get a long range radiated noise picture, low frequency, of the submarine as it operates under varying parameters at steps of speed at different ranges and we use points known as convergence points so we get maximum information on a track lying roughly 047 between Eleuthera and Bermuda.

Q. You get in addition to the frequency of the equipment in the submarine, you also obtain information about propeller noise and any external emanation, is that right?

A. That is right. That is affirmative, primarily in the detection trial.

Q. Now what is your professional background and experience which fits you for your present position?

A. I am a Naval Academy graduate and a qualified submarine officer. I have instructed at the Naval Academy in Marine engineering for one year. I served in destroyers, carriers, submarine school and am a submarine school graduate. I served in the USS BARB and USS TRUMPETFISH. I was engineer in the latter for a period of two years. I have shipyard experience in that I was in a ship that was mined during the Korean war; put a carrier out of commission; did two submarine overhauls; was in BARB during one overhaul, and in TRUMPETFISH during another. I have been at the U. S. Naval Engineering Experiment Station working in primarily submarine engineering since 1956, sir, and in this particular function as BUSHIPS trial director for detection trials for three years.

Q. And as BUSHIPS trial director, you advise BUSHIPS of the analysis you perform on your data, advise them for changes to subs to quiet them?

A. I do, sir.

Q. What studies have you previously conducted on THRESHER?

A. We conducted a structure borne and detection trial in August, 1961. This time I rode THRESHER for the structureborne trial and was at the Island of Eleuthera conducting the detection trial following the structureborne noise. Two of my men rode THRESHER during the acoustic shock trial in Key West in 1962, which was preceded by a short detection trial and then radiated noise trial and was in turn, following the shock trial, there was another radiated and then detection trial.

Q. Can you tell the court as to any correlation you have been able to make between the data you compiled in previous THRESHER noise trials and these exhibits?

A. Yes, sir. As an advisor to Captain Leehey during this period, we reviewed the data that exists here in light of previous data. I can speak of these without even referring to them if you would like in that they are here.

Q. All right.

A. Basically, from my experience in what we have detected in previous trials during the portion of the grams shown here which immediately preceded the presumed time of loss of THRESHER, there is an indication, a definite indication b(1) My own opinion is these b(1) because we had no history of detection of THRESHER's main coolant pumps at slow speed.

Q. At any range?

A. At any range.

Q. Do you have any other information--Before I ask that question, do you identify the traces on these exhibits, and I am referring now to 52, 54, and 53--can you state from your knowledge of the characteristic sounds you have been able to familiarize yourself with, as emanating from THRESHER, that these tracers indicate THRESHER?

A. No one could say positively that that indicates THRESHER. There is about a 90 per cent probability that it is THRESHER, in that there were no other known nuclear boats in the area. This is a typical b(1) detection signature. Therefore, I would just say there is a very high probability of it being THRESHER.

Q. One last question on the same point. Is there anything in there contra-indicative of the fact that it is THRESHER?

A. No sir. Just one other point. There is a possible detection of b(1) which may or may not have been discussed previously. This frequency at approximately b(1) is a very typical b(1) It shows a slight turn pattern at 1210 Zulu and it fades at approximately 1250. This would put THRESHER at a b(1) It's in at the start of this gram, sir, there is an indication of a slight turn pattern at 1210. The signature then continues and fades at approximately 1250.

COUNSEL FOR THE COURT: The witness was indicating Exhibit 52 during this part of the testimony.

PRESIDENT: That speed was one--

WITNESS: b(1)

Q. Do you have any other information you are prepared to give us in regard to this matter?

A. Just to say that our past experience with THRESHER in the post shock detection trials which would be the most pertinent and closest in the point of time to this trial, would indicate that the b(1)