City and County of Honolulu
Honolulu Fire Department
636 South Street, Honolulu Hawaii 96813
Cellular Phone: 808-620-3226
Office Phone: 808-723-7178
Fax: 808-723-7179

Fire Investigations

The Following Report Pertains to a Fire/Explosion Incident that occurred at:

1680 East West Rd., Post 109, Honolulu, HI 96822

Fire Investigation Report Number: 2016HFD0015761

Lead Fire Investigator: FF3, I. Raphael, CFEI, CVFI
Date of Report: March 30, 2016

Technical Reviewer: Captain, J. Hooker, CFEI
Date of Review: March 30, 2016

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1 INVESTIGATION SUMMARY REPORT

General Details:
Occupant: **Thea Ekins-Coward** TMK: **2-8-023-003:000**
Incident Address: **1680 East West Rd., Post 109, Honolulu, HI 96822**
Date of Incident: **March 16, 2016** Time of Alarm: **17:51 hours**
Initial Fire Company On-scene: **Ladder 29 / 2nd Platoon**

Lead Fire Investigator: **Fire Investigator, I. Raphael, CFEI, CVFI** Lead Agency: **Honolulu Fire Department**
Fire Investigator, **Captain J. Hooker,** assisted with this investigation.

General Weather Conditions (based on local area weather station):
On-scene Observations: **10 - Clear (less than 1/10 cloud cover).**
Air Temp (F): **73.9** Dew Point (F): **55.9** Humidity (%): **53**
Wind Speed (mph): **19.6-24.2** Wind Direction: **North** Lightning: **No** Precipitation: **No**

Area of Origin: **31 - Laboratory** Point of Origin: **Portable gas cylinder**

Related Casualty (injury/fatality): **Injury**

Explosion Details:
Source and Form of Heat of Ignition:
Source: **Digital Pressure gauge**
Form: **Electrical Arc/Spark**

First Material: Ferrous Cylinder
Item: **Portable Cylinder- Speedaire 13 gallon Model: 2TWC3**
Material: **15 - Hydrogen gas. Mixed with CO and CO2.**

Factors Contributing to Ignition:
1) **Digital pressure gauge not designed for the conditions it was installed.**

Fire / Explosion Classification:
Based on the totality of this investigation to include but not limited to the physical examination of the incident scene, observed fire patterns, photographs, witness statements and the culmination of my training, education and experience, it is with a reasonable degree of fire investigative certainty that this incident was caused **by an accidental explosive event.**

This fire/explosion has been classified as **ACCIDENTAL** pending any further information.

Total Damage Estimate: $ **Unable estimate loss.**

2 WRITTEN CONSENT (COPY)

Honolulu Fire Department—Fire Investigation Report # 2016HFD0015761

WRITTEN CONSENT TO INVESTIGATE

I, Hans O. Nielsen (Name of owner/occupant), hereby grant access to the Honolulu Fire Department (HFD) Isaac Raphael, CFEI (Print name and rank of HFD personnel)

to my personal property described as: 1680 East West Rd. POST 109 (License, location, address, apartment number, etc...) Honolulu, Hi 96822 Cab. 30

I understand that the HFD Is conducting an investigation relating to the origin and cause of a fire/ explosion that occurred at the above mentioned location on 3/16/16 (Date)

I am fully aware that I have a constitutional right to be free from warrantless intrusions and that I may refuse to allow this investigation; however, I waive this right.

I am fully aware that I have a right to consult with an attorney before allowing this investigation; however, I waive this right.

I am fully aware that any evidence uncovered by this investigation may be used against me in a court of law.

I am not under the influence of drugs or alcohol and am mentally capable of making decisions.

I voluntarily grant access to the above mentioned personal property and affirm that I am not being threatened, coerced, or intimidated in any manner. I further confirm that no promises have been made to me in return for my consent.

Witness:		Consenter:	
Signature	Date/Time	Signature	Date/Time 3/24/16 10:12am
Nicholas Metivier		Hans Nielsen	
Printed Name	Relationship to Consenter UH Employee - Facilities	Printed Name	

Fire Investigator:

Signature	Date/Time 3/24/16	Isaac Raphael, CFEI
		Printed Name

HFD 88 07-07

3 INCIDENT DETAILS

Incident Address: **1680 East West Rd., Post 109, Honolulu, HI 96822** Property TMK: **2-8-023-003:000**

General Weather Conditions (based on local area weather station):

On-scene Observations: **10 - Clear (less than 1/10 cloud cover).**

Air Temp (F): **73.9** Dew Point (F): **55.9** Humidity (%): **53**

Wind Speed (mph): **19.6-24.2** Wind Direction: **North** Lightning: **No** Precipitation: **No**

Laboratory Professor:

Name: **Jian Yu, Ph.D.** DOB: [redacted]

Address: [redacted]

Home Phone: **Unknown** Cell Phone: [redacted] Work Phone: **808-956-5873**

Comments: **Refer to attached statement in Appendix A.**

Post-Doctoral Fellow Researcher:

Name: **Thea Ekins-Coward** DOB: [redacted]

Address: [redacted]

Home Phone: **None** Cell Phone: [redacted] Work Phone: **None**

Comments: **Refer to attached statement in Appendix A.**

Person Discovering the Incident:

Name: **Unknown** DOB: n/a

Address: **n/a**

Home Phone: **n/a** Cell Phone: **n/a** Work Phone: **n/a**

Comments: **n/a**

Person Reporting the Incident:

Name: **Unknown** DOB: **n/a**

Address: **n/a**

Home Phone: **n/a** Cell Phone: **n/a** Work Phone: **n/a**

Comments: **n/a**

Investigation Request:

Date of Request: **March 16, 2016** Time of the Request: **20:10 hours**

Agency Making the Request: **Honolulu Fire Department** Contact Person: **BN2/2nd Platoon, G. Chang**

Request Received by: **Honolulu Fire Department, Fire Dispatch** Contact Person: **RC**

General Arrival / Departure Information:

Arrival Date: **March 16, 2016** Arrival Time: **20:29 hours**

Scene Secured: **Yes** Securing Agency: **HFD/HPD** Manner of Security: **Physical Presence and Barrier Tape**

Authority to Enter Scene: **Exigent Circumstances and Written Consent**

Departure Date: **March 16, 2016** Departure Time: **23:30 hours**

Incident scene left in the custody of: **Owner Representative**

Assisting Agencies:

Secondary Fire Department: **None** Report Number: **n/a**

Law Enforcement: **Detective M. Tom (HPD)** Report Number: **Unknown**

Private Investigation Agency:

Eugene Ngai- Chemically Speaking LLC- Specialty Gas Technology, Safety and ER
Ken Smith- Executive Director Environment, Health and Safety Office of Risk Services University of California.
Imke Schroeder- Research Project Mgr, UC Center of Laboratory Safety
Craig A. Merlic- Center for Laboratory Safety

4 IMMEDIATELY DANGEROUS TO LIFE AND HEALTH (IDLH) EVALUATION

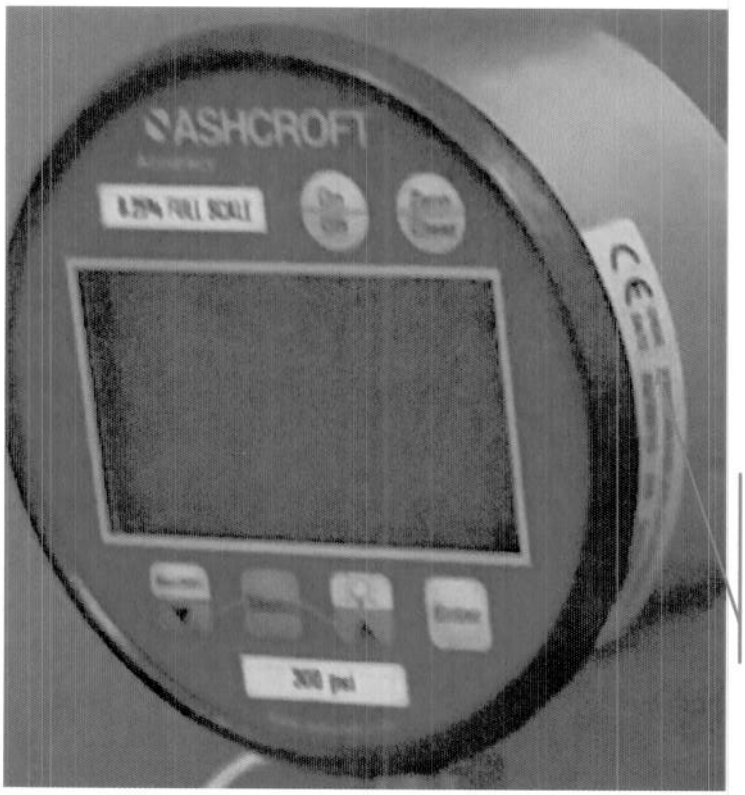
I performed a visual IDLH evaluation of the incident scene and did not observe any concerns that would prevent me from continuing my investigation into the Origin and Cause of this fire/explosion incident utilizing appropriate personal protection equipment (PPE).

5 OBSERVATIONS AT THE IDENTIFIED AND/OR PROBABLE POINT OF ORIGIN

The interior of the **Structure** was examined from the least damage to the greatest damage in consideration of ventilation, fuel load, witness statements and my overall observations.

Witness statements are noted in Appendix A while any supplemental documentation is noted in Appendix B. Digital photographs were taken at this incident and are being held in the case file.

The following observations are specific to the identified and/or probable Point of Origin:

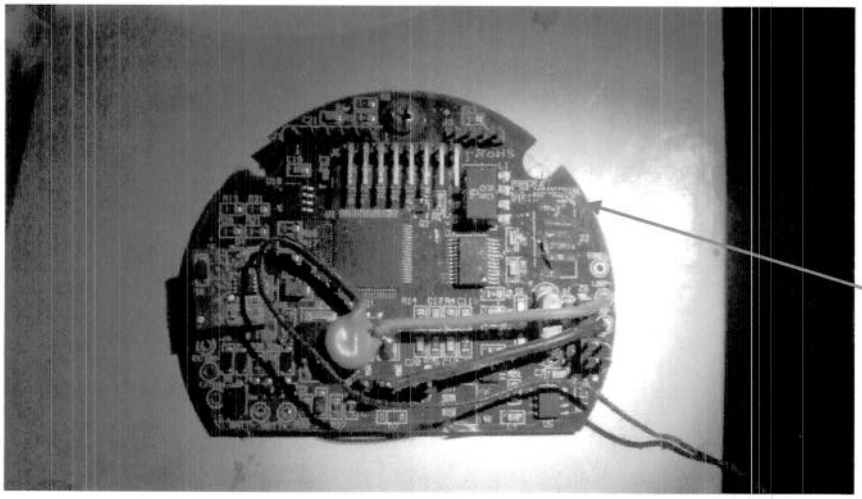


These photos were provided by Professor Jian Yu and is part of the apparatus.

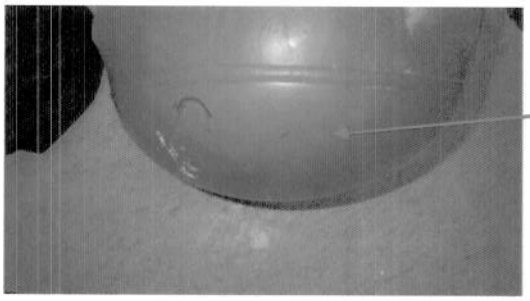
- **Markings on the gauge do not indicate it's an intrinsically safe gauge as would be evidenced by having any of these markings below.**

Europe	Europe	USA	USA	Canada	Brazil
IECEx	EU (ATEX)	FM Approval	UL	CSA	INMETRO

Russia	Australia	China	Korea	Japan
GOST-R	ANZEx	NEPSI	KCs	TIIS



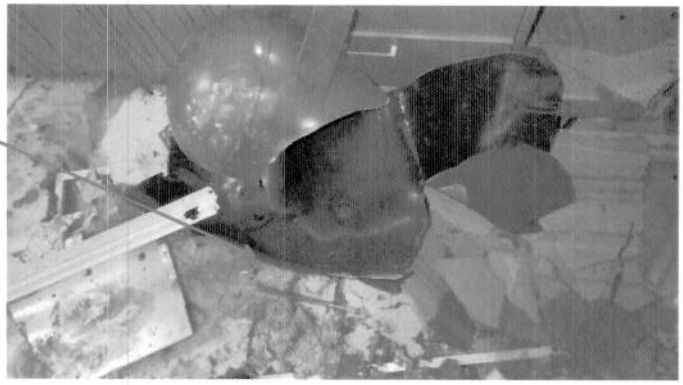
Ashcroft 3.0" Industrial Digital Gauge. This is the circuit board to the gauge above. The body of the gauge went missing between Mar.17, 2016-Mar. 21, 2016 and has not been recovered as of this writing.

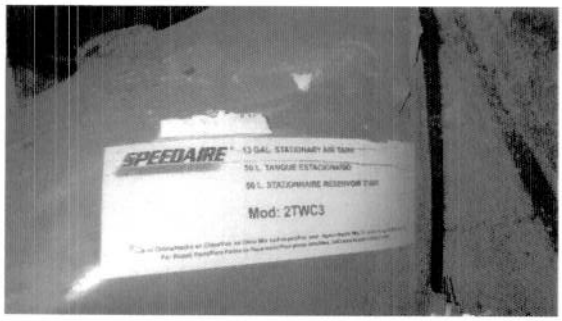


Bulge in the tank end cap.

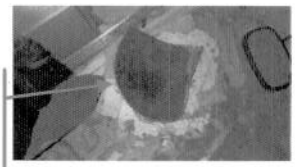
Horizontal tear across the weld of the tank.

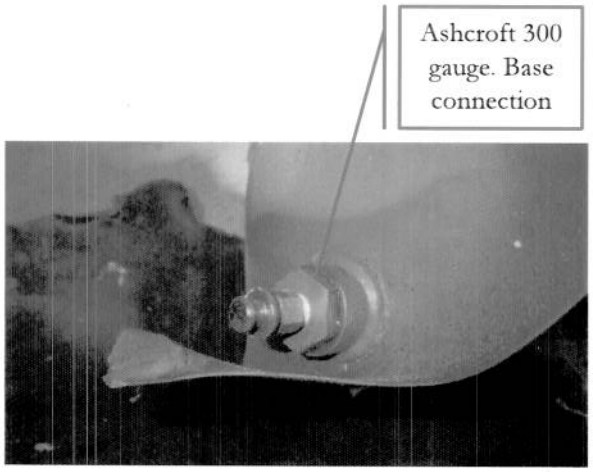
Tank identification below.

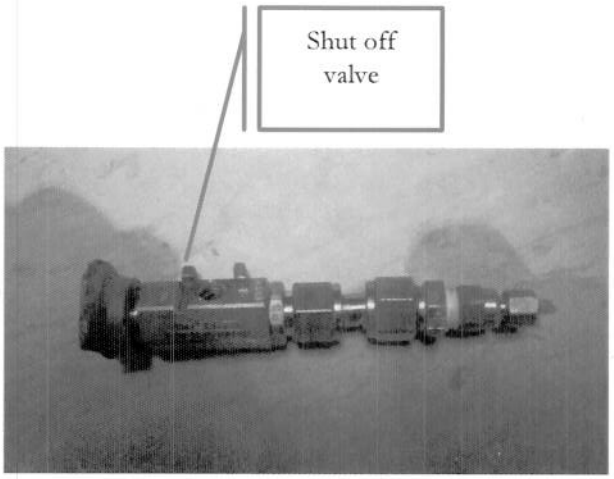


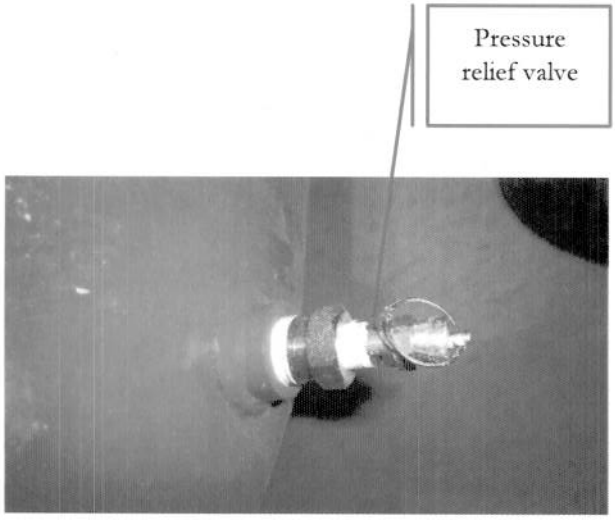


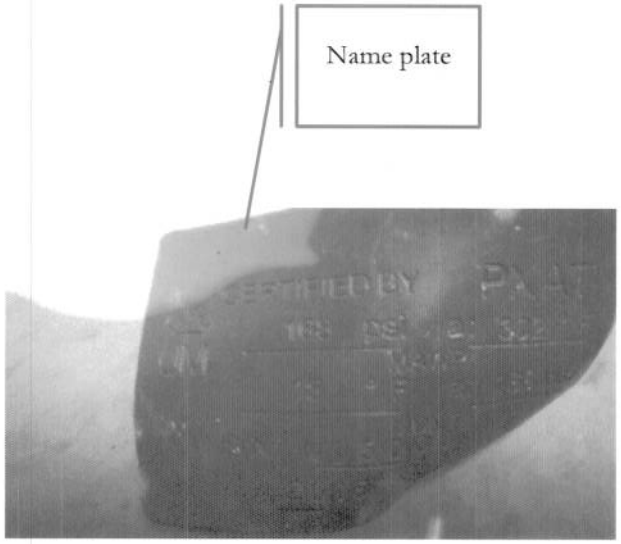
Severed end cap.

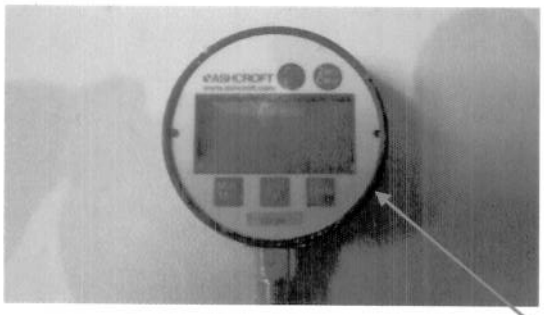



Ashcroft 300 gauge. Base connection


Shut off valve


Pressure relief valve


Name plate



Ashcroft 100 psi gauge previously used as per witness statement regarding an earlier incident.

Body of the gauge that is missing

Appears to be a battery used to operate this gauge.

Cleaning of Personal Protective Equipment (PPE) and Tools

All personal protective equipment and tools utilized during the course of this investigation were properly cleaned and decontaminated or disposed of at the conclusion of the on-site phase of this investigation.

6 HYPOTHESES CONSIDERED

Natural Fire /Explosion Cause:

- No severe weather activity was observed or reported in the area

Level of Certainty: **No supporting evidence to indicate a natural fire cause**

Accidental Fire/Explosion Cause:

- Accidental causes were considered and only one probable cause remained.

The accidental cause of this explosion was caused by the detonation of compressed gasses to include: Hydrogen, Carbon Dioxide, and Oxygen within the air tank. A digital pressure gauge used to check the pressure within the tank was not rated or designed (not Intrinsically Safe) to be in a flammable gaseous atmosphere. When the OFF button was pressed, an electrical arc/spark created within the gauge detonated the flammable gas within the tank causing the explosion.

Level of Certainty: **Probable, with a reasonable degree of fire investigative certainty.**

Incendiary Fire/Explosion Cause:

- There were no observed or reported indications of an intentionally set fire.

Level of Certainty: **No supporting evidence to indicate an intentional fire cause.**

Undetermined Fire/Explosion Cause:

Refer to fire cause noted above

Level of Certainty: **Refer to fire cause noted above**

Recommendation.
It is my recommendation that all items of interest (tagged and un-tagged) in the area of fire origin, and/or at the identified/probable point of fire origin, be further examined by a certified forensics laboratory or other certified authority.

Referrals to Other Agencies:

1. **HIOSH- Tin Shing Chao** [redacted]
2. **Honolulu Police Department, Criminal Investigations Division**

7 FIRE ORIGIN AND CAUSE

Description of Area of Origin:

31 - Laboratory

Description of the probable Point of Origin:

The item of interest is an air tank on the floor near the south wall adjacent to the counter cabinets. This air tank was separated at two points. One end cap was completely severed from the tank and the weld that ran horizontally across the tank was split open. The opposite end cap remain intact but there was visual evidence of over pressurization as the end cap bulged outward.

There were 4 threaded holes in the tank; one was for the digital pressure gauge, one for the shut-off valve, one for the drain, and the last for the pressure relief valve. Only the pressure relief valve and drain valve remained intact and affixed to the tank. The pressure gauge and shut off valves were separated from the tank when the explosion occurred.

Explosion Cause:

Source and Form of Heat of Ignition:
Source: **Digital Pressure gauge**
Form: **Electrical Arc/Spark**

First Material: Ferrous Cylinder
Item: **Portable Cylinder- Speedaire 13 gallon Model: 2TWC3**
Material: **15 - Hydrogen gas. Mixed with CO and CO2.**

Factors Contributing to Ignition:
2) Digital pressure gauge not designed for the conditions it was installed.

Fire/Explosion Classification:

Based on the totality of this investigation to include but not limited to the physical examination of the incident scene, observed fire patterns, photographs, witness statements and the culmination of my training, education and experience, it is with a reasonable degree of fire investigative certainty that this incident was caused **by an accidental explosive event.**

This fire/explosion has been classified as **ACCIDENTAL** pending any further investigation.

Total Damage Estimate: $ **Unable estimate loss.**

8 EVIDENCE/ITEMS OF INTEREST

Item Number 1:

Description: **Speedaire- 13 gallon cylinder 2TWC3**

Tagged: **Yes**

Removed by HFD Investigator: **No**

Current Location: **Place of discovery**

Collected by HPD Officer/Investigator: **No**

Name: **n/a**

Collected by Private Investigator/Other: **Unknown**

Name: **n/a**

Item Number 2:

Description: **n/a**

Tagged: **n/a**

Removed by HFD Investigator: **n/a**

Current Location: **n/a**

Collected by HPD Officer/Investigator: **n/a**

Name: **n/a**

Collected by Private Investigator/Other: **n/a**

Name: **n/a**

Item Number 3:

Description: **n/a**

Tagged: **n/a**

Removed by HFD Investigator: **n/a**

Current Location: **n/a**

Collected by HPD Officer/Investigator: **n/a**

Name: **n/a**

Collected by Private Investigator/Other: **n/a**

Name: **n/a**

Item Number 4:

Description: **n/a**

Tagged: **n/a**

Removed by HFD Investigator: **n/a**

Current Location: **n/a**

Collected by HPD Officer/Investigator: **n/a**

Name: **n/a**

Collected by Private Investigator/Other: **n/a**

Name: **n/a**

9 APPENDIX A – WITNESS STATEMENTS/OBSERVATIONS

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9.1 FIRE CREW STATEMENT/OBSERVATIONS – BATTALION CHIEF GEOFFREY CHANG

Name: **G. Chang** Rank: **Battalion Chief**

Assigned Fire Company: **L29/2nd**

Role at Incident: **Incident Command**

Location of the Interview: **Incident scene**

The following was related by the named HFD Member above.

1 serious victim, lost arm possible.

Female victim oriented x's 3. She was transported to Queens Hospital.

She was working in the basement lab when an explosion occurred. She was in the process of mixing gasses when the metal cylinder blew up.

A metal cylinder blew up.

Possible biological agents in the lab. Awaiting confirmation from Hazmat 1.

The building was evacuated.

Hazmat 1's plan is to review the list of chemicals that were being used in the lab then re-evaluate mitigating actions.

It was later determined that there were no biological hazards. The building was deemed safe to continue the investigation.

University staff shut off gas to the building.

This page and 0 continuation pages were transcribed from my field interview with the stated Member above.

Date: **March 16, 2016**

Time: **2035** hours

9.2 WITNESS STATEMENT/OBSERVATIONS – JIAN YU, PH.D.

Name: **Jian Yu, Ph.D.** DOB: **Unknown**

Involvement: **Laboratory Professor**

Home/Work Address: **1680 East West Rd. Post 109, Honolulu, HI 96822**

Occupation: **Researcher**

Home Phone: **Unknown** Cellular Phone: [redacted] Work Phone: **808-956-5873**

Location of the Interview: **Incident address**

The following was related to me by the named individual above:

The victim Thea Ekins-Coward was working as a Post-Doctoral Fellow trained in Marine Science and a Chemical Engineer.

She was hired by Dr. Yu October 2015 to conduct research in bioplastics and biofuels.

In response to my questions he related that:

The tank that failed was Ms. Ekins-Coward's design. She bought the equipment (tank, digital gauge, pressure relieve valve, and fittings) between November 2015 and January 2016. The tank was to have been rated at 10 bar or 150 psi. When the tank was assembled with its parts, a pressure test was done using the buildings air which produced 91.2 psi. Several leaks were detected. So the tank assembly was taken to the Universities maintenance for help in stopping the leaks.

This particular tank was used to contain a mixture of gases to include: 70% Hydrogen, 10% Carbon dioxide, and 20% Oxygen in that order and to a normal operating pressure of 50 psi.

The tank was not grounded and was normally moved from a stored location to areas where it could be filled. The tank would be moved approximately 3 feet to fill it with Hydrogen and Carbon Dioxide, then moved approximately 13' so it can be filled with Oxygen.

They have a Bunsen burner but was not used at the time of the incident.

This page and 0 continuation pages were transcribed from my field interview with the stated Individual above.

Date: **March 17, 2016**

Time: **0930** Hours

9.3 WITNESS STATEMENT/OBSERVATIONS – THEA EKINS-COWARD

Name: **Thea Ekins-Coward** DOB:

Involvement: **Victim**

Home/Work Address: [redacted]

Occupation: **Post-Doctoral Fellow Researcher**

Home Phone: **None** Cellular Phone: [redacted] Work Phone: **None**

Location of the Interview: **Queens Medical Center,** [redacted]

The following was related to me by the named individual above:

From our conversation I learned that:

The air tank and assembly that failed was purchased between November 2015 and January 2016. The parts were assembled and pressure tested with the building supplied air. This output of air was 91.2 psi which was sufficient enough to cause leaks at the connections so the tank assembly was taken to the Universities maintenance shop where they helped stop the leaks. The design of this tank assembly was that of Dr. Jian Yu. The tank was rated at 145 psi.

The air tank (13 gallon Speedaire- model: 2TWC3) was used to contain a mixture of gasses to include: 70% Hydrogen, 20% Oxygen, and 10% Carbon Dioxide. In doing her research, she needed to change the composition of the gasses to 70% Hydrogen, 25% Oxygen, and 5 % Carbon Dioxide.

This premixed gas would then be connected to a reactor.

**On this particular day, she moved and filled the tank with a set amount of gasses using the Ashcroft 300 psi digital gauge that is battery operated. This gauge is a push button type for ON and OFF.
When she disconnected the hoses used to fill the tank, she checked the pressure in the tank to verify the amount to be 117 psi. She then pressed the OFF button and the tank exploded. Prior to the explosion, she did not hear any sounds of escaping or leaking gasses from any of the fittings or pressure relief valve.**

She did not lose consciousness or hit her head; she was aware that she lost her arm in the explosion. She couldn't open the door to the lab, the door was stuck closed. A person by the name of Savannah was there to help get the door open and help her out of the lab.

She added that earlier in the week, she was conducting another experiment using a smaller one gallon size air tank assembly nearly as identical as the one that failed using similar components to include the Ashcroft 100 digital pressure gauge and the premixed gasses. The tank pressure was set to 27 psi. After reading the gauge, she pressed the OFF button and a small internal explosion occurred. She related to me that there was evidence of a soot and smoke stains.

Static shock also appeared to have been a problem as Ms. Ekins-Coward would get shocked on occasion when touching the tank.

She brought this information to the attention of Mr. Yu who she said told her don't worry about it.

I asked if they have been doing this type of experiment for a long time why now did this happen. She related to me that this is the first time the use of premixed gas in a portable tank to conduct experiments was being done. In the past, each individual gas would have a separate hose line and be premixed at the reactor eliminating the use of a portable tank.

She was alert and knew what was going on.

This page and 0 continuation pages were transcribed from my field interview with the stated Individual above.

Date: **March 22, 2016**

Time: **1215** hours

10 APPENDIX B – SUPPLEMENTAL DOCUMENTS

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10.1 STRUCTURE EXAMINATION

Type of Occupancy:

Property TMK: **2-8-023-003:000** Zoning: **Residential** Occupancy Use: **Educational**

Estimated Year of Construction: **Unknown** Number of Floors: **8 upper floors with a basement**

Length: **~190** Width: **~150**

Property Status:

Building Status: **02 - In normal use**

Name of the last individual in the structure: **Unknown**

Date the individual was last in the structure: **March 16, 2016** Time of departure: **Time of alarm**

Exited via which exit: **Unknown**

Building Construction:

Foundation Type: **Basement** Foundation Material: **Poured concrete**

Exterior Material: **Poured concrete** Roof Material: **I was unable to view the roof**

Type of Construction: **Type II, Non-combustible**

Main Floor (building foot print) Square Footage: **~28,500**

Damaged Square Footage: **~800**

Building Fire Protection / Security:

Presence of Automatic Fire Suppression System: **01- Present**

Type of Automatic Fire Suppression System: **UU - Undetermined**

Operation of Automatic Fire Alarm System: **02 - System was present but did not alert occupants**

Presence of Smoke Detectors: **Undetermined** Power/Operation of Detectors: **n/a**

Presence of/and operation of Security Cameras: **No security system was observed**

Condition of Doors and Windows:

Doors: **Undetermined** Forced/Broken: **No** Forced/Broken by: **n/a**

Windows: **n/a** Forced/Broken: **n/a** Forced/Broken by: **n/a**

First Arriving Fire Company's Observations:

First Arriving Fire Company: **Ladder 29/2nd Platoon** Company Commander: **Capt. D. Dougan**

Observations: **A Statement was not taken from Captain David Dougan.**

Battalion Chief In-Charge of Incident: **BN2/2nd Platoon, G. Chang**

Observations: **Chief Chang was managing the incident scene on our arrival. See Witness statement**

Building Utilities:

Electrical Service: **Yes**	Provider: **Hawaiian Electric Company**	Number: **808-548-7961**
Gas Service: **Undetermined**	Provider: **The Gas Company**	Number: **808-535-5933**
Water Service: **Yes**	Provider: **Board of Water Supply**	Number: **808-748-5010**
Telephone Service: **Undetermined**	Provider: **Undetermined**	Number: **n/a**

Loss Estimate Based on Square Footage of Observed Fire Damages:

Loss Estimate to Structure ($125/$200/$400):	**$ 0**
Loss Estimate to Contents:	**$ 0**
Loss Estimate Other:	**$ 0**
Total Loss Estimate:	**Cannot Estimate Loss**

10.1.1 Exterior Structure Examination

Owner of the Structure/Property:

Name: **State of Hawaii/Hans Nielsen** DOB: **n/a**

Home/Work Address: **1680 East West Rd., POST 109, Honolulu, HI 96822**

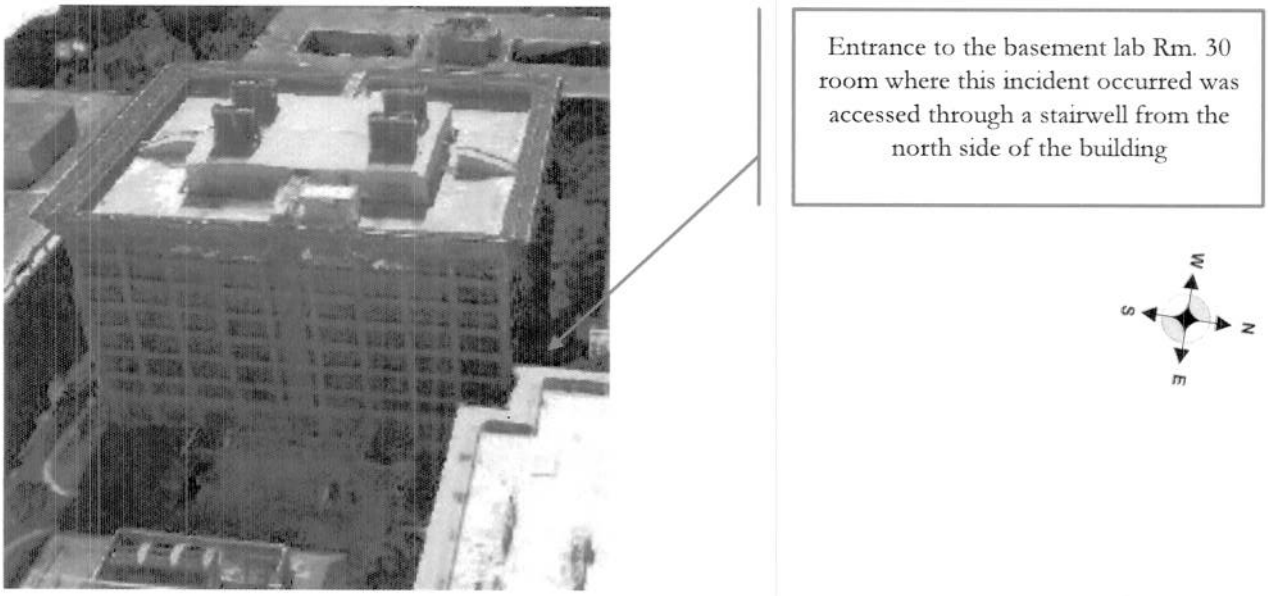
Occupation: **n/a**

Home Phone: **n/a** Cellular Phone: **n/a** Work Phone: **808-956-5180**

General Impression of the Structure:

Overall: **No observed structural damage** Incident Damage: **No observed fire damage**

Aerial View of the Structure/Property:



The perimeter of the building was photographed and and determined not to be the origin of this incident.

10.1.2 Electrical Service/Panel Examination

Meter/Main Disconnect Location: **Unknown** Main Size: **Unknown**

Meter Number: **Unknown** Main Disconnect Turned Off: **No**

Turned Off by: **n/a** Fire/Heat Damaged: **n/a**

General Comments:

- Electrical service to the building was remote to the building and secured.

Electrical Distribution Panel Location: **Lab 30 - east wall** Circuit Protection Devices: **Breakers**

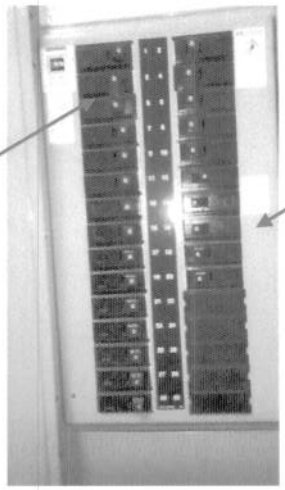
Breakers Turned Off: **Yes** Turned Off by: **Electrical maintenance- Bob Shinagawa**

Interior Examination Conducted: **No** Fire/Heat Damaged: **No**

General Comments:

- 100 amp service to Lab 30.

- The distribution panel for the lab was located against the east wall behind the entrance door (right side). No damage was observed at the panel or circuit breakers.



10.1.3 Interior Structure Examination

Post-Doctoral Fellow Researcher:

Name: **Thea Ekins-Coward** DOB: [redacted]

Home/Work Address: [redacted]

Occupation: **Dr. Fellow Research**

Home Telephone: **n/a** Cellular Phone: [redacted] Work Phone: **n/a**

General Impression of the Interior of the Structure:

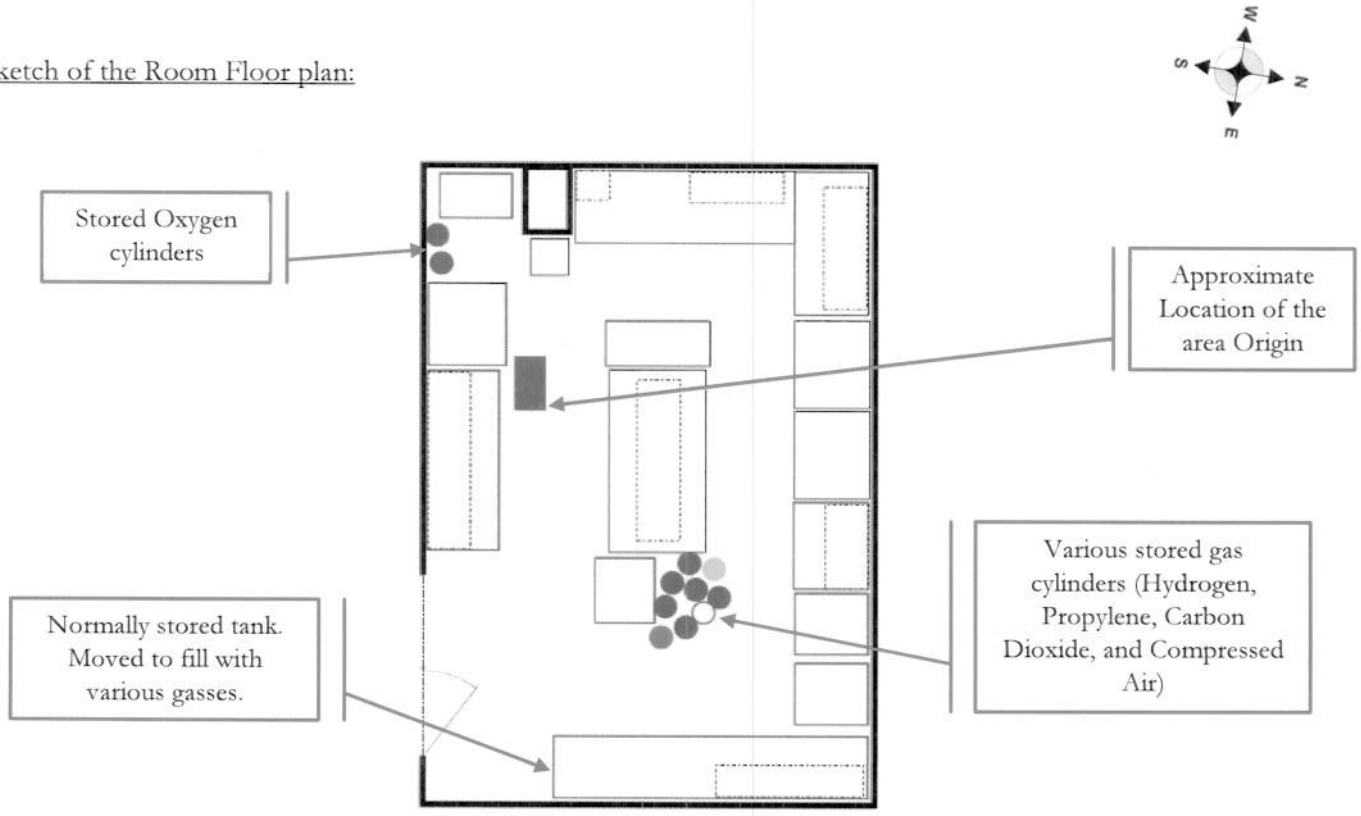
Overall: **Moderate observed structural damage** Fire Damage: **Minor observed fire damage**

Room Designation of Probable Fire Origin: **Lab Room**

Room Length (ft.): **~40** Room Width (ft.): **~20** Room Height (ft.): **~12**

Ceiling Material: **Other** Floor Material: **Concrete**

Sketch of the Room Floor plan:



Interior Wall Designation (corresponding exterior wall): **North**

Wall Covering Material: **Gypsum Board**

Number of Windows: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

Number of Doors: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

Observed Electrical Receptacles:

Electrical outlets were observed. No visible arcing or damage occurred to the outlets.

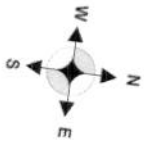
Observed Ignition Sources:

Electrical branch circuit(s), fixture(s) and appliance(s)

Observed Fuels:

Common combustibles (paper, plastic, wood, textiles other)

Did the explosion originate on or in the proximity of this wall? **No**



Other Observations:

An island work bench separated the north and south wall. Assorted test equipment and electrical outlets were visually observed with no electrical arc or short noted. The explosion did not occur in this area.

Drop ceiling panels and florescent lamp fixtures fell from its location and was hanging by their respective wire conductors.

Fallen Petri dishes and test tubes was scattered throughout the floor and countertops.

Interior Wall Designation (corresponding exterior wall): **West**

Wall Covering Material: **Gypsum Board**

Number of Windows: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

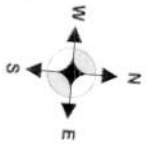
Number of Doors: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

Observed Electrical Receptacles:

Electrical outlets were observed. No visible arcing or damage occurred to the outlets.

Observed Ignition Sources:

Electrical branch circuit(s), fixture(s) and appliance(s)



Observed Fuels:

Common combustibles (paper, plastic, wood, textiles other)

Did the explosion originate on or in the proximity of this wall? **No**

Other Observations:

This photo is facing the south west wall.

An island work bench on the right separated the north and south wall. Assorted test equipment and electrical outlets were observed. No electrical arc or short was observed in this area. The explosion did not occur did not occur against the west wall area.

Interior Wall Designation (corresponding exterior wall): **South**

Wall Covering Material: **Gypsum Board**

Number of Windows: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

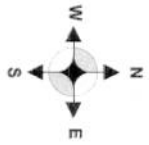
Number of Doors: **1** Dimensions: **(2)32" x 7' (approx)** Fire/Heat Damaged: **Moderate damage observed**

Observed Electrical Receptacles:

Electrical outlets were observed. No visible arcing or damage occurred to the outlets.

Observed Ignition Sources:

Electrical branch circuit(s), fixture(s) and appliance(s)



Observed Fuels:

Common combustibles (paper, plastic, wood, textiles other), flammable/combustible gas (possible)

Did the explosion originate on or in the proximity of this wall? **Yes**

Other Observations:

An island work bench on the right separated the north and south wall. Assorted test equipment and electrical outlets were observed. No electrical arc or short was observed in this area. The explosion did occur approximately the center of the lab against the south work bench.

Interior Wall Designation (corresponding exterior wall): **East**

Wall Covering Material: **Gypsum Board**

Number of Windows: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

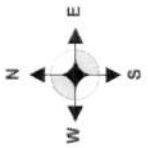
Number of Doors: **None** Dimensions: **n/a** Fire/Heat Damaged: **n/a**

Observed Electrical Receptacles:

Electrical distribution panel is located against this wall. No structural damage was observed. Electrical outlets were observed. No visible arcing or damage occurred to the outlets.

Observed Ignition Sources:

Electrical branch circuit(s), fixture(s) and appliance(s)



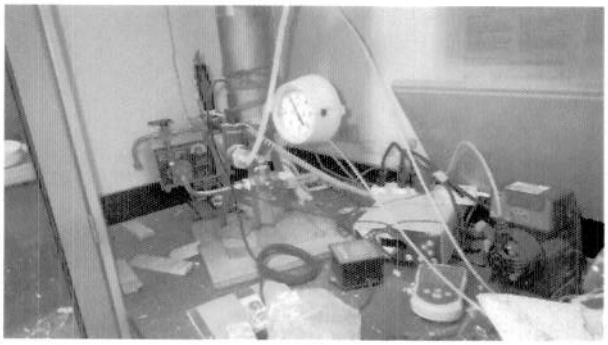
Observed Fuels:

Common combustibles (paper, plastic, wood, textiles other), flammable/combustible gas (possible)

Did the Fire Originate on or in the Proximity of this wall? **No**

Other Observations:

Gas cylinders are located opposite this photo against the island work bench.



Other Pertinent Information regarding the Interior of this Structure:

March 24, 2016 at approximately 1030, I met with Hans Neilsen at the incident location to gain access to LAB Rm. 30. Accompanying me was Inv. Edward Millerd, Hans Neilsen, and Nicholas Metivier.

The purpose of our re-examination was a follow up on my investigation. This was to include, closer photos of the failed air tank and its associated parts.

What was not found and is considered missing is the Ashcroft 300 digital gauge that is visible in my photos JH folder #253, 269, 288, 289 and # 20160209_084856 in folder Jian Yu photos.

March 28, 2016, at approximately 1100, I spoke with Nicholas Metivier UH Employee Facilities. He related that a cleanup company hired to decontaminate the lab worked from March 17-March 19, 2016. He took before pictures with his camera phone and it appeared the missing gauge was in one of the photos.

10.2 INCIDENT RELATED CASUALTY

General Information.

Name: **Thea Ekins-Coward** DOB: [redacted] Gender: **Female**

Address: [redacted] Telephone: [redacted]

Occupation: **Post Fellow** Address: **University of Hawaii**

Physical Identifiers: **None**

Casualty Treatment.

Treated at Scene: **Yes** Initial Treatment By: **Emergency Medical Services**

Medical Care Transferred To: **Emergency Medical Services**

Transported: **Yes** Where: **Queens Medical Center**

Injury Description.

Type of Injury: **Trama** Severity of Injury: **Severe**

Brief Description: [redacted]

Next of Kin.

Name: **Amy Ekins-Coward** Telephone: [redacted]

Address: [redacted] Relationship to Victim: **Spouse**

Notified: **Yes** Date/Time of Notification: **Unknown date and time**

Victim Information.

Location victim was discovered: **Science lab where Ms. Thea Ekins-Coward was working**

Person who discovered victim: **Unknown** Position of victim's body: **Able body**

Significant blood present: **Yes** Other Information: **None**

10.3 Fire/Explosion Investigation Methodology

Recognize the Need (Identify the Problem)

- Event ☒
- Assignment ☒
- Particular Role (Investigate the Origin/Cause) ☒
- Event Location ☒

Define the Problem

- Assess the Incident ☒
- Determine Equipment Needs ☒
- Understand Fire Service Actions and Response ☒
- Obtain Right of Entry ☒
- Conduct Scene Safety Inspection ☒
- Secure the Scene ☒
- Conduct a Preliminary Incident Inspection ☒

Collection of Data

- Conduct Interviews ☒
- Conduct Exterior Examination ☒
- Conduct Interior Examination ☒
- Document and Tag Physical Evidence (if needed) ☒
- Document and Tag Pertinent Documents (if needed) ☒
- Diagram the Scene ☒
- Photograph the Scene ☒
- Compile Field Notes ☒

Analyze Data Collected

- Examine Burn Patterns ☒
- Correlate Witness Statements ☒
- Develop TimeLine if Necessary ☒
- Examine Reasonable Potential Fire/Explosion Causes ☒
- Examine Necessary Documents ☒
- Reconstruct the Incident Scene ☒

Develop Hypothesis (Inductive Reasoning)

- Based on the data analysis, develop a hypothesis or hypothesis to explain the phenomena observed.
  - Origin ☒
  - Cause ☒
  - Fire Spread ☒
  - Responsibility ☒

Test Hypothesis (Deductive Reasoning)

- Consider all Reasonable Natural Fire/Explosion Causes ☒
- Consider all Reasonable Accidental Fire/Explosion Causes ☒
- Consider all Reasonable Incendiary Fire/Explosion Causes ☒
- Consider all Facts in Relation to the Hypothesis and Select Final Hypothesis ☒
- Test Hypothesis against Known Facts ☒
- Experiment and/or Model (as necessary) ☒

Select the final hypothesis

If the final hypothesis fails after consideration of all known facts, re-analyze the data. If the hypothesis stands-up to the known facts, consider it as the probable cause of this incident.

Incident Report
2016-0015761 -000

Printed: 04/18/2016 12:54:31
Number of Pages: 14

Basic	
Alarm Date and Time	17:51:12 Wednesday, March 16, 2016
Arrival Time	17:58:17
Controlled Date and Time	
Last Unit Cleared Date and Time	23:20:04 Wednesday, March 16, 2016
Response Time	0:07:05
Priority Response	Yes
Completed	Yes
Reviewed	Yes
Release to Public	Yes
Fire Department Station	ST29
Shift	B
Incident Type	223 - Air or gas rupture of pressure or process vessel
Aid Given or Received	N - None
Alarms	1
Action Taken 1	42 - Hazmat detection, monitoring, sampling, & analysis
Action Taken 2	55 - Establish safe area
Action Taken 3	86 - Investigate
Casualties	No
EMS Provided	Yes
Apparatus - Suppression	4
Apparatus - Other	3
Personnel - Suppression Personnel	13
Personnel - Other	11
Property Loss	$0.00
Contents Loss	$0.00
Property Value	$0.00
Contents Value	$0.00
Property Use	241 - Adult education center, college classroom
Location Type	Address
Address	1686 East West RD
City, State Zip	Honolulu, HI 96822
District	2
Census Tract	0027.01
Directions	1686 East West Rd
Latitude	21.297014
Longitude	-157.815066
Map Page	7.01

Situation	
Initial Dispatch Code	412
Critical Incident	No

Person Involved - Alpuro, Savannah	
Name Prefix	MS
Last Name	Alpuro
First Name	Savannah

Person Involved - Alpuro, Savannah	
Business Name	Univ. Security Officer
Street Address	
Phone	8089569611

Person Involved -	
Occupies Property	Yes
EMS Patient	Yes
Involvement Code	WIT
Last Name	
First Name	
Street Address	
City, State Zip	Honolulu, HI
Phone	

Person Involved - Evangelista-Gouveia, Bridget	
Last Name	Evangelista-Gouveia
First Name	Bridget
Business Name	Univ. Security (Seargent)
Street Address	
Phone	8089566911

Person Involved - HAWAII STATE GOVERNMENT, -	
Involvement Code	REP
Last Name	HAWAII STATE GOVERNMENT
First Name	-
Street Address	

Person Involved -	
Name Prefix	MS
Last Name	
First Name	
Business Name	Witness/Rescuer
Street Address	
Phone	

Person Involved -	
Name Prefix	MR
Last Name	-
First Name	
Business Name	Researcher
Street Address	
Phone	

Person Involved - Sukekane, C	
Name Prefix	MR
Last Name	Sukekane

Person Involved - Sukekane, C	
First Name	C
Business Name	HPD LT, Badge#329
Street Address	
Phone	8085514481

Person Involved -	
Name Prefix	MR
Last Name	
First Name	
Business Name	Head Researcher
Street Address	
Phone	

Apparatus - Bn1	
Apparatus ID	Bn1
Apparatus Dispatch Date and Time	17:53:34 Wednesday, March 16, 2016
Apparatus Clear Date and Time	17:55:13 Wednesday, March 16, 2016
Apparatus priority response	Yes
Apparatus cancelled after dispatch	Yes
Number of People	2
Apparatus Use	0
Apparatus Action Taken 1	93 - Cancelled en route
Apparatus Type	92 - Chief officer car
Personnel 1	26037 - Harris, Leslie-James C Position: FF2
Personnel 2	8954 - Bowers, John A Position: BC

Apparatus - L29	
Apparatus ID	L29
Response Time	0:06:00
Apparatus Dispatch Date and Time	17:52:17 Wednesday, March 16, 2016
En route to scene date and time	17:56:25 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	17:58:17 Wednesday, March 16, 2016
Apparatus Clear Date and Time	23:20:04 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	5
Apparatus Use	0
Apparatus Action Taken 1	73 - Provide manpower
Apparatus Action Taken 2	42 - Hazmat detection, monitoring, sampling, & analysis
Apparatus Action Taken 3	21 - Search
Apparatus Type	12 - Truck or aerial
Personnel 1	21080 - Oishi, Ken H Position: FF3 Personnel Action Taken 1: 58 - Operate apparatus or vehicle Personnel Action Taken 2: 42 - Hazmat detection, monitoring, sampling, & analysis

Apparatus - L29	
	Personnel Action Taken 3: 21 - Search
Personnel 2	32973 - Berting, David M
	Position: FF1
	Personnel Action Taken 1: 73 - Provide manpower
Personnel 3	76167 - Hass, Adam B
	Position: FF1
	Personnel Action Taken 1: 73 - Provide manpower
	Personnel Action Taken 2: 42 - Hazmat detection, monitoring, sampling, & analysis
	Personnel Action Taken 3: 21 - Search
Personnel 4	18657 - Dougan, David K
	Position: CAPT
	Personnel Action Taken 1: 73 - Provide manpower
Personnel 5	17761 - Peterson, Derek K
	Position: FF2
	Personnel Action Taken 1: 58 - Operate apparatus or vehicle
	Personnel Action Taken 2: 73 - Provide manpower

Apparatus - Bn2	
Apparatus ID	Bn2
Response Time	0:04:33
Apparatus Dispatch Date and Time	17:55:13 Wednesday, March 16, 2016
En route to scene date and time	17:55:20 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	17:59:46 Wednesday, March 16, 2016
Apparatus Clear Date and Time	22:00:27 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	2
Apparatus Use	1
Apparatus Action Taken 1	81 - Incident command
Apparatus Type	92 - Chief officer car
Personnel 1	31751 - Endow, Keith T
	Position: FF2
Personnel 2	19522 - Chang, Geoffrey A
	Position: BC

Apparatus - E29	
Apparatus ID	E29
Response Time	0:06:14
Apparatus Dispatch Date and Time	17:53:57 Wednesday, March 16, 2016
En route to scene date and time	17:56:26 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	18:00:11 Wednesday, March 16, 2016
Apparatus Clear Date and Time	22:01:12 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	4
Apparatus Use	1
Apparatus Action Taken 1	76 - Provide water
Apparatus Action Taken 2	63 - Restore fire alarm system

Apparatus - E29	
Apparatus Type	11 - Engine
Personnel 1	12997 - Villalon, Anthony K
	Position: FF3
Personnel 2	24291 - Tauro, Edward J
	Position: FF1
Personnel 3	71885 - Ponce, Nicholas K
	Position: FF1
Personnel 4	21062 - Tom, Kevin B
	Position: FF1

Apparatus - HM1	
Apparatus ID	HM1
Response Time	0:14:48
Apparatus Dispatch Date and Time	17:53:28 Wednesday, March 16, 2016
En`route to scene date and time	17:56:15 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	18:08:16 Wednesday, March 16, 2016
Apparatus Clear Date and Time	21:58:48 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	5
Apparatus Use	1
Apparatus Action Taken 1	42 - Hazmat detection, monitoring, sampling, & analysis
Apparatus Action Taken 2	44 - Hazardous materials leak control & containment
Apparatus Action Taken 3	86 - Investigate
Apparatus Action Taken 4	81 - Incident command
Apparatus Type	93 - HazMat unit
Personnel 1	28078 - Ishida, Kenn T
	Position: FF2
	Personnel Action Taken 1: 42 - Hazmat detection, monitoring, sampling, & analysis
	Personnel Action Taken 2: 44 - Hazardous materials leak control & containment
Personnel 2	30826 - Baldeviso, Dean S
	Position: FF2
	Personnel Action Taken 1: 42 - Hazmat detection, monitoring, sampling, & analysis
	Personnel Action Taken 2: 44 - Hazardous materials leak control & containment
Personnel 3	12418 - Randall, Dean W
	Position: FF3
	Personnel Action Taken 1: 86 - Investigate
	Personnel Action Taken 2: 74 - Provide apparatus
Personnel 4	13383 - Adams, Alexander J
	Position: CAPT
	Personnel Action Taken 1: 86 - Investigate
	Personnel Action Taken 2: 81 - Incident command
Personnel 5	18980 - Flores, Destry K
	Position: FF2
	Personnel Action Taken 1: 42 - Hazmat detection, monitoring, sampling, & analysis
	Personnel Action Taken 2: 44 - Hazardous materials leak control & containment

Apparatus - L05	
Apparatus ID	L05
Response Time	0:09:07
Apparatus Dispatch Date and Time	18:55:05 Wednesday, March 16, 2016
En route to scene date and time	18:57:41 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	19:04:12 Wednesday, March 16, 2016
Apparatus Clear Date and Time	22:38:56 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	4
Apparatus Use	0
Apparatus Action Taken 1	86 - Investigate
Apparatus Type	12 - Truck or aerial
Personnel 1	1882 - Miller, Christopher J Position: FF3 Personnel Action Taken 1: 86 - Investigate
Personnel 2	26059 - Cuban, Javen K Position: FF1
Personnel 3	19386 - Calistro, Dean A Position: FF1
Personnel 4	21705 - Goo, Bryan K Position: CAPT

Apparatus - INV2	
Apparatus ID	INV2
Response Time	0:18:40
Apparatus Dispatch Date and Time	20:10:57 Wednesday, March 16, 2016
En route to scene date and time	20:11:02 Wednesday, March 16, 2016
Apparatus Arrival Date and Time	20:29:37 Wednesday, March 16, 2016
Apparatus Clear Date and Time	22:57:26 Wednesday, March 16, 2016
Apparatus priority response	Yes
Number of People	2
Apparatus Use	1
Apparatus Action Taken 1	86 - Investigate
Apparatus Type	00 - Other apparatus/resource
Personnel 1	2238 - Hooker, Jeffrey S Position: CAPT Personnel Action Taken 1: 86 - Investigate
Personnel 2	3570 - Raphael, Isaac L Position: FF3 Personnel Action Taken 1: 86 - Investigate

Authority	
Reported By	13383 - Adams, Alexander J 01:49:03 Thursday, March 17, 2016
Officer In Charge	19522 - Chang, Geoffrey A 23:46:18 Wednesday, March 23, 2016
Reviewer	19522 - Chang, Geoffrey A

Authority

20:55:36 Friday, April 8, 2016

Narratives

Narrative Name	L5
Narrative Type	Company
Narrative Date	23:39:37 Wednesday, March 16, 2016
Author	21705 - Goo, Bryan K
Author Rank	CAPT
Author Assignment	1
Narrative Text	L5 was dispatched for a special call to assist Bn2 with a gas leak at The University of Hawaii Campus. L5 arrived at scene and was assigned RIT by UH Command. L5 assembled gear and staged adjacent to the mauka entrance to the POST Building. After the RIT assignment was completed, L5 was later assigned to enter the lab and search for a severed upper body limb. L5 and HM personnel made entry, did a search and used the camera on the company iPhone to document what was seen. L5 was told to exit before anything the limb could be found. L5 did a brief decon and was released from the scene by UH Command. L5 exchanged PPE and returned equipment to service. L5 available.

Narrative Name	Bn2
Narrative Type	Incident
Narrative Date	00:03:17 Thursday, March 17, 2016
Author	19522 - Chang, Geoffrey A
Author Rank	BC
Author Assignment	1
Narrative Text	Bn2 arrived on scene and established University Command. Two UH Security Guards, Sgt. Bridget Evangelista-Gouveia and Officer Savannah Alpuro, along with grad student had made entry to the damaged Laboratory by kicking in the door. They extricated the patient to the elevator where L29 personnel found her sitting on the floor. As we walked up to the scene, L29 brought the patient out of the building and placed her in the ambulance. Bn2 called FCC and informed them that the patient care was transferred to EMS. Command had HPD and campus security evacuate the building and set up a perimeter around the building. Command met with the building manager and asked him find out who was in charge of the lab involved as well as what chemicals/product were in the lab and what kind of research was being done. A graduate student who worked in the lab, Mr. (orange T-shirt) came forward and explained what was in the lab and what type of work was done there. He informed us of what we had to do to shut everything off. Mr. drew a map of the basement and the locations of the gas cylinders in question. We did have some trouble understanding Mr.

Narratives

ecause he had a strong accent.

Mr. xplained that the researcher was working on a renewable energy experiment that involved transferring CO2, CO, O2, Hydrogen gas, and Helium gas from large high pressure cylinders into a 13 gallon mixing tank. The mixture was then added to a solution of water and organic phosphates. Mr. was not sure how or why there was an explosion.

Ms. , another graduate student came forward to assist. She stated that she was actually the first person on scene after the explosion and was familiar with the lab. She had been working in room #3 when the explosion took place and she ran to help. She drew another map for us of the basement and the Lab in question.

HM1 arrived on scene and began their investigation. It was determined that Hydrogen, Oxygen, Carbon Monoxide, Carbon Dioxide, and Helium were the possible gasses involved in the explosion. After meeting with both Mr. and Ms. , HM1 determined that it would be safe to enter the basement to investigate and turn off all of the gas cylinders.

E29 was assigned water supply and L29 was assigned as RIT.
L29 officer was assigned as Safety Officer.
FF3 D. Randall (HM1/2) was assigned as entry officer.
Command requested another Ladder Company be dispatched to the incident to assist with ventilation and RIT.

A Communications Plan was developed with B2-tac 4 as the primary radio channel for the entry team. The back-up channel would be HFD-Talk 1.
B2-tac 3 was the primary operations channel.

HM1 personnel entered the building and monitored the air quality. No LEL was detected. There were several compressed gas cylinders in the room with open valves but no gas was leaking. All tanks were closed and the atmosphere was declared safe as no LEL was detected.

HM1 personnel also conducted a primary search for the missing arm with negative results. HM1 exited the building.

L5 arrived on scene and was assigned as RIT. L29 entered the building to conduct a secondary search for the missing arm with a HM1 representative to monitor the atmosphere. Only traces of the arm were found and Bn2 ordered that they be left in place for the investigative team.

HM1 sent a team to walk the remainder of the building, all floors, and assess the atmosphere. Again, no LEL was detected.

All companies exited the building and all personnel were accounted for.

Narratives

L5 was assigned to enter the building and search the attic space of the lab for the missing arm, again only traces of the arm were found.

At this point the person in charge of the lab (Mr.) informed us that there were some biological agents in the room that were used for experiments.

All personnel were ordered to exit the building.

Command, HM1 officer, and Mr. Brian Taylor, the Dean of the School of Ocean and Earth Science and Technology, questioned Mr. further. He provided documentation upon request and showed us that this biological agent was no threat to humans. He also discussed each chemical in the room with the HM officer and assured us that there was no threat to life. Mr. ensured all three of us that none of the chemicals or compounds posed any threats, even when mixed together.

The Fire Investigator arrived on scene, was briefed and began his investigation. The Fire investigator, Captain Hooker, informed Command that he was told there was a similar explosion one or two days ago. Command asked Mr. Brian Taylor if he was aware of any explosions other than the one we were currently dealing with and Mr. Taylor stated he was not.

At this point Mr. (orange T-shirt), walked up. Command asked him if he was aware of an explosion that may have happened within the past two days and he said yes. Mr. stated that it had happened doing the same experiment as the one that resulted in the explosion today. He also stated it was nothing to worry about because it was small.

Captain Hooker was satisfied that the scene was safe to enter and conduct his investigation.

Companies were released as they secured their equipment and personnel.

The scene was left in the command of the Fire Investigator and HPD investigators.

Bn2 became available for response.

Narrative Name	HM1
Narrative Type	Incident
Narrative Date	00:40:49 Thursday, March 17, 2016
Author	13383 - Adams, Alexander J
Author Rank	CAPT
Author Assignment	1
Narrative Text	At 1751 hours on Wednesday March 16, 2016 we were dispatched to an air or gas rupture of pressure or process vessel. Seven units were assigned to this incident. Twenty-two personnel responded. We arrived on scene at 1758 hours and cleared at 2320 hours. The incident occurred at 1686 East West Rd, Honolulu in District 2. The local station is ST29. The general description of this property is adult education center, college classroom. The

Narratives

primary task(s) performed at the scene by responding personnel were material detection, monitoring, sampling, and analysis. No mutual/automatic aid was given or received.

Alarm number 0015761 has been assigned to this incident.

HM1 arrived at scene and briefed by BN2. There was an explosion in the basement of the POST building. One female person in the room had a serious arm injury. She was assisted by another worker in the building and later by fire fighters and transferred to EMS.

A researcher for the basement lab said the explosion might be caused by hydrogen and oxygen mixing in another container. He said there was also Nitrogen, CO2, CO, and Helium cylinders in the lab. He confirmed that turning off the cylinders would be a safe task. He provided a sketch of the basement layout and of the lab. Several entrances on the ground floor was opened for ventilation. After consulting with BN2, HM1 sent a 3 man entry team with fire fighters from E29 and L29 as RIT. The mauka entrance was used as the entry point. HM1 entry surveyed the lab and encountered heavy damage to the lab including the walls and ceiling. A large amount of blood was located near the doorway. A broken water pipe in the ceiling was leaking. Meter readings were normal with no LEL readings in the lab. HM1 turned all cylinder valves off. No limbs were found. HM1 entry returned and gave a report.

A second entry was done by HM1 and E29 to the lab. Other HM1 team members surveyed the rest of the upper floors of the building. No elevated readings were detected. HM1 encountered at least 3 people on the upper floors of the building that never evacuated the building earlier.

A third entry was made by L5 and HM1 to the lab to search the ceiling area. Police investigators surveyed the lab also.

The head researcher provided a inventory declaration of microorganism in the lab. The microorganism eutropha 17699 (bacterium) was listed. There was a concern because it was located in a refrigerator that was badly damaged in the explosion. The researcher assured HFD personnel that the organisms were inert and was not a health hazard. Chemicals spilled on the ground (white powder,water) also was not hazardous. Blood from the injured person was still a concern. HFD personnel decontaminated their boots after entry.

HM1 escorted a plumber to turn off the water leaking from the ceiling. HM1 provided boots for head researcher and escorted him to survey the lab for any other hazardous issues to HFD personnel. He determined that there were none.

Fire investigators arrived. Later, BN2 released the building to UH officials. Companies were released. HM1 became available.

Narrative Name	Bn1

Narratives

Narrative Type	Company
Narrative Date	22:40:18 Thursday, March 17, 2016
Author	8954 - Bowers, John A
Author Rank	BC
Author Assignment	1
Narrative Text	Bn1 was notified of this alarm prior to dispatch by phone from FCC. Between the time of phone call and walking out to apparatus and starting to response, Bn1 was taken off this incident by FCC. Bn1 available.
Narrative Name	E29
Narrative Type	Incident
Narrative Date	12:53:19 Monday, March 21, 2016
Author	12997 - Villalon, Anthony K
Author Rank	FF3
Author Assignment	1
Narrative Text	E29 arrived at scene and coordinated the movement of vehicles to gain access to the standpipe and hydrant. Per University Command, E29 secured a water source and hooked up to the standpipe. E29 personnel assisted University Command with securing building and egress points for entry team. Upon clearance from HazMat 1 E29 personnel assisted UH Security with restoring their fire alarm system. E29 personnel were required to go to the floor of the explosion to reset the pull station. Also, there was a flow alarm warning on the 5th floor which E29 personnel investigated (no flow found). E29 decontaminated personnel and equipment with a 1" hose, picked up, and became available.
Narrative Name	L29
Narrative Type	Company
Narrative Date	20:42:17 Monday, March 21, 2016
Author	18657 - Dougan, David K
Author Rank	CAPT
Author Assignment	1
Narrative Text	L29 responded to a gas leak alarm at the UHM POST Building. While en route Fire Dispatch updated the incident status to include a person with a severe upper limb injury, who was located in the basement of the building and that forcible entry might be required to get to the patient. At scene, L29 assisted EMS in getting patient out of building and taking her to the ambulance rig, placing her in the care of C & C EMS MICT J. Kusano, Makiki Unit. (Patient was found just outside the basement elevator doors when L29 exited the elevator, in the company of another UHM Lab Student and a UHM Security Guard who was also with her. They had tried their best to cover the patient's right arm injury, which had been severed below the shoulder just above the elbow. L29 applied the Combat Tourniquet as quickly as possible and set it before bringing the patient up out of the building and taking her to the ambulance rig). L29 officer was assigned as Safety Officer. L29 crew was then assigned by BN2 Command as RIT Backup Team to HM1 Entry Team. When L5 arrived, BN2 Command assigned L5 as RIT Backup Team and reassigned L29 to assist HM1 with monitoring atmosphere and conducting a secondary search for what was left of patient's right arm, and

Narratives

finding only flesh traces of it.
After the All Clear was given, L29 was released from the incident by BN2 Command and returned to quarters to extract PPEs and prepare 2nd set of PPEs for use before becoming available for response.

Narrative Name	Investigator
Narrative Type	Incident
Narrative Date	08:17:17 Wednesday, March 30, 2016
Author	3570 - Raphael, Isaac L
Author Rank	FF3
Author Assignment	8
Narrative Text	Investigation Summary.

General Details:
Owner/Occupant: University of Hawaii
Incident Address: 1680 East West Rd. Honolulu, HI 96822
Date of Incident: March 16, 2016
Time of Incident: 1751 hours.

Lead Fire Investigator: Isaac Raphael, CFEI-CVFI.
Lead Agency: Honolulu Fire Department.
Assisting Fire Investigator: Captain J. Hooker, CFEI, and Edward Millerd.

General Weather Conditions.
On-scene Observations: Overcast (more then 9/10 cloud cover).
Air Temp (F): 73.9
Dew Point (F): 55.9
Humidity (%): 53
Wind Speed (mph): 19.6 gust 24.2.
Wind Direction: N.
There was no reported lightning or other severe weather activity reported, although there was some light passing showers throughout the day.

Area of Origin.
Laboratory Rm. 30.

Point of Origin.
Digital pressure gauge and pressurized air tank.

Fire Related Casualty (injury).
was severely injured in this accident.

Explosion Details.
Source of Ignition: A battery operated pressure gauge.

Form of Ignition: Arc/spark from a gauge that is not intrinsically safe.

Narratives

First Material Ignited: Hydrogen, Carbon Dioxide, and Oxygen gas mix.

Factors Contributing to Ignition.
Installation of a pressure gauge not designed for its intended use.

Fire / Explosion Classification.
Based on the totality of this investigation to include but not limited to the physical examination of the incident scene, observed damage, photographs, witness statements and the culmination of my training, education and experience, it is with a reasonable degree of investigative certainty that this incident was caused by an accident.

The ACCIDENTAL cause of this explosion was caused by the detonation of compressed gasses to include: Hydrogen, Carbon dioxide, and Oxygen within an air tank. A digital pressure gauge used to check the pressure within the tank was not rated or designed (not intrinsically safe) to be in a flammable gaseous atmosphere. When the OFF button was pressed by the victim, an electrical arc/spark created within the gauge detonated the flammable gas within the tank causing the explosion.

This explosion has been classified as ACCIDENTAL pending any further information.

This fire incident report has been amended to reflect the findings of my investigation. The Fire Investigation case file (to include the Fire Investigation Report, Photographs and any Supplementary Documentation) are being held at the HFD, Fire Investigation Section 2 Office.

Narrative Name	Auto Narrative- inv
Narrative Type	Incident
Narrative Date	08:36:19 Wednesday, March 30, 2016
Author	3570 - Raphael, Isaac L
Author Rank	FF3
Author Assignment	8
Narrative Text	At 1751 hours on Wednesday March 16, 2016 we were dispatched to an air or gas rupture of pressure or process vessel. Seven units were assigned to this incident. Twenty-four personnel responded. We arrived on scene at 1758 hours and cleared at 2320 hours. The incident occurred at 1686 East West Rd, Honolulu in District 2. The local station is ST29. The general description of this property is adult education center, college classroom. The primary task(s) performed at the scene by responding personnel were material detection, monitoring, sampling, and analysis. No mutual/automatic aid was given or received. Alarm number 0015761 has been assigned to this incident.

Narrative Name	Technical Review
Narrative Type	Incident
Narrative Date	09:52:16 Wednesday, March 30, 2016
Author	2238 - Hooker, Jeffrey S
Author Rank	CAPT
Author Assignment	8
Narrative Text	I reviewed this report and concur with the findings of Fire Investigator I. Raphael.