NA--LASO-LANL-TA55-2011-0018 FINAL

Occurrence Report

After 2003 Redesign

Plutonium Proc & Handling Fac

(Name of Facility)

Plutonium Processing and Handling

(Facility Function)

Los Alamos National Laboratory Los Alamos National Laboratory

(Laboratory, Site, or Organization)

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(Facility Manager/Designee)

Name: HUNSINGER, MARK W

Title: OCCURRENCE INVESTIGATOR **Telephone No.:** (505) 665-1496 (505) 665-1496

(Originator/Transmitter)

Name: Mark Hunsinger **Date:** 10/31/2011

(Authorized Classifier (AC))

1. Occurrence Report Number: NA--LASO-LANL-TA55-2011-0018

Management Concern: Criticality Safety Issue Indicate Process and Communications Issues

2. Report Type and Date: FINAL

	Date	Time
Notification:	08/17/2011	19:34 (ETZ)
Initial Update:	09/27/2011	15:20 (ETZ)
Latest Update:	10/31/2011	15:45 (ETZ)
Final:	10/31/2011	15:45 (ETZ)

3. Significance Category: 3

4. Division or Project: TA-55

5. Secretarial Office: NA - National Nuclear Security Administration

6. System, Bldg., or Equipment: Criticality Safety

7. UCNI?: No

8. Plant Area: PF-4

9. Date and Time Discovered: 08/11/2011 14:30 (MTZ)

10. Date and Time Categorized: 08/15/2011 12:15 (MTZ)

11. DOE HQ OC Notification:

Date	Time	Person Notified	Organization
09/27/2011	12:07 (MTZ)	Art Trujillo	NNSA

12. Other Notifications:

Date	Time	Person Notified	Organization
08/12/2011	09:26 (MTZ)	Todd Davis	DNSFB
08/12/2011	09:26 (MTZ)	Art Trujillo	NNSA

13. Subject or Title of Occurrence:

Management Concern: Criticality Safety Issue Indicate Process and Communications Issues

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14. Reporting Criteria:

10(2) - An event, condition, or series of events that does not meet any of the other reporting criteria, but is determined by the Facility Manager or line management to be of safety significance or of concern for that facility or other facilities or activities in the DOE complex. The significance category assigned to the management concern should be based on an evaluation of the potential risks and impact on safe operations. (1 of 4 criteria - This is a SC 3 occurrence)

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15. Description of Occurrence:

MANAGEMENT SYNOPSIS: At approximately 1430 on August 11, 2011, Technical Area 55 (TA-55) personnel working in a room of the 300-Area of Building PF-4 realized that a potential Criticality Safety Limit (CSL) infraction had occurred. A Nuclear Materials Science Group (MST-16) worker (W1) was working in a glovebox and had moved items into one end of a glovebox to facilitate photographing, inadvertently exceeding the posted Criticality Safety Limit Approval (CSLA). The Pit Integrated Technologies Group (MET-2) Project Lead Engineer (W2)

recognized the issue upon entering the room and immediately asked the MST-16 worker to return all items to their previous locations while she began notifications of a potential CSL infraction. The room was evacuated and access controlled until Safety Basis Criticality Safety Group (SB-CS) personnel could assess the situation. It was determined that no hazard existed at that point and the room was released for normal operations.

A critique was scheduled after the weekend for August 15, 2011. At this critique, further information was brought to light concerning the processes of authorization for work in a specific glovebox, the appropriate response to a potential CSL infraction, and timely and complete communications. The TA-55 Facilities Operations Director (FOD) declared this event a Management Concern, Significance Category 3.

BACKGROUND: W1 was originally certified as a Fissile Material Handler (FMH) worker in 2007 and was then recertified, as required every two years, in 2009. W2 was certified as a FMH worker in 2009. The initial FMH worker training and the every-two-year recertifications covers basic principles such as reading and interpreting CSLAs, Local Area Network Materials Accounting System (LANMAS) transactions for material movements, and proper response to potential criticality issues.

On March 29, 2011, TA-55 issued ADPSM-NOTICE-002, ADPSM Material, Glovebox, and Configuration Ownership in PF-4. In this Notice, Nuclear Component Operations (NCO) Division was made responsible for Special Nuclear Material (SNM) in processing rooms. All non-NCO personnel work with SNM was to be conducted with NCO cognizance and approval only. NCO was to assign a specific individual as the owner of each glovebox in PF-4. This Notice specifically states that further direction would be forthcoming, in order to clarify and provide further direction concerning glovebox ownership. This Notice was a required Read and Sign and both W1 and W2 completed the Read and Sign months prior to the event. It was distributed by attaching to the TA-55 Shift Orders.

In April, the NCO Division Leader was tasked with assigning personnel to create a Glovebox Owner List. The Actinide Process Chemistry (NCO-2) Group Leader was tasked to create this list. In speaking with the FOD's office, it was suggested he work with personnel from Facility System Engineering TA-55 (ES-55) in using the Master Equipment List (MEL) to create the Glovebox Owner List. Having completed this, the draft list was turned into the FOD's office and the NCO Division Leader.

On August 4, 2011, the items of the August 11 event were cast in the casting furnace, a glovebox in the same room but separate from the glovebox of the event. W1 and W2 both witnessed the material during and after casting, when all the material was in one location. Once the items were broken out of their mold, they were moved into an inert glovebox, the glovebox of the event. Weapon Component Manufacturing and Surveillance (NCO-1) technicians and W2 prepared the inert glovebox prior to moving the items. The CSLAs had to be reviewed prior to moving the items into it. A NCO-1 First Line Manager (FLM) was the assigned Glovebox Owner.

W1 scheduled with the Photographer to take photos of the items on August 10, 2011. That morning, he spoke with W2, who informed him that the room was unavailable and the

photography would have to be postponed. There was no time pressure to photograph these items; they were to remain in this glovebox for a month or more before being processed further. The task of photography was not specifically on the Programmatic Plan-of-the-Day (POD); however, MET-2 photography was typically captured under General Foundry Activities.

On the afternoon of August 11, 2011, the Photographer contacted W1 and informed him he was available. W1 called W2 to inform her that the Photographer was available and would be heading to the room. W2 was on a late lunch break and said she would head to the room soon. W2, being authorized to work in that particular glovebox, had planned to meet the Photographer and hold up each item for photography.

W1 proceeded to the room, meeting the Photographer there. W1 and the Photographer briefly spoke with the Casting Project Engineer Lead, indicating that they were going to be taking some photographs. The Casting Project Engineer Lead returned to the casting glovebox where he and several NCO-1 technicians were in the middle of operations. The Photographer set up his equipment for photography, and W1, in proper Personal Protective Equipment (PPE), placed his hands in the glovebox. He was not authorized at this time to perform work in this particular glovebox. The glovebox contained only his items in partitioned slip-top canisters.

The items were removed from their slip-top canisters and placed on the floor of the glovebox for photographing. According to the CSLAs, the canisters and molds are an administrative control that must be used for staging and pass-through of these particular items in order to reduce interaction sufficiently for the normal condition calculations to be bounding and to survive certain credible upsets. Removing the items from the canisters was a criticality issue. Although it was understood that the items may be transferred from one container to another, any handling or processing of items outside of containers was outside the scope of the evaluation.W1 then moved four items from one side of the glovebox to the other, so that all eight items could be photographed together. Each set of four items had been in separate LANMAS locations and by placing them all in a single location an overmass criticality issue occurred. Although the task of photography was not a criticality safety concern, the process and associated upsets of these items being placed on the floor of the glovebox and collocated was not a process that was specified in the CSLA or that had been analyzed by criticality safety.

W1 proceeded to use the angle iron delimiter to prop up some of the items for photographing. The delimiter was an engineered control that was credited in the criticality safety analysis and provided a physical boundary between LANMAS locations. By moving the delimiter, that control was no longer in place, which created a third criticality issue. Taking all these issues together, a Criticality Safety Level 3 Infraction had occurred.

At this time, approximately 1415, W2 entered the room. W2 was surprised to see W1 in the glovebox, having expected to be handling the items herself for photography. Upon approaching the glovebox, she thought there was a criticality issue; however, no one else had realized or reacted to the issue. After another moment of thought, she told W2 that the current configuration was a potential criticality issue and suggested that he return all items to their former configuration while she made notifications. This was the first criticality safety event in which W1 and W2 had been part of the response.

TA55-AP-522, Nuclear Criticality Safety, requires TA-55 workers, upon discovering a potential CSL infraction, to pause work and to have all personnel stand at least 15 feet from the affected glovebox. Then personnel are to notify supervision, which in turn is expected to notify the TA-55 Operations Center (OC), the Group Leader, and the Criticality Safety Group (SB-CS) before any recovery actions are to be taken.

While W1 returned items to their former configuration, the Photographer packed up his gear and left, having completed the needed photographs. W2 spoke briefly with the Casting Lead Engineer and then paged her FLM. Her FLM was in a meeting, which he left immediately and returned W2's page. While W2 spoke with her FLM, W1 finished remediating the event and stepped away from the glovebox. W2 informed her FLM of the status of an on-going casting operation and her FLM told her that the casting operation should proceed to completion. Upon hanging up, W2 spoke again with the Casting Engineer Lead while W2's FLM walked to the OC to notify them of the potential criticality issue.

W2 and the Casting Engineer Lead informed personnel to stay back at least 15 feet from the affected glovebox. W2 stayed nearby to keep personnel from approaching the glovebox. Not all personnel in the room were fully informed at this time as to the issue with the glovebox, or the need to stay back. NCO-1 personnel involved in the casting operations were tightly focused on their task at this time. Shortly afterwards, the Associate Director (AD) of Plutonium Science and Manufacturing (PSM) entered the room and briefly spoke with W2. The NCO-1 Glovebox Owner and the MET-2 Group Leader arrived. At this time, all personnel were made completely aware of the issue. The MST-16 Deputy Group Leader arrived and spoke briefly with W1 before the decision was made to have all but two people exit the room. One NCO-1 casting technician and the NCO-1 Glovebox Owner, who is also a NCO-1 FLM, remained to finish off the casting operation. This took approximately two minutes, and then these remaining personnel also exited the room.

There was much discussion in the hallway about red-lighting the room in order to control access since there was more than one door into the room. Activating the red-light above the door to a room denotes the need to contact a Radiological Control Technician (RCT) prior to entering. The room was red-lit after a phone consultation with an RCT. The NCO-1 Group Leader and Deputy AD arrived at this time. As personnel discussed the event in the hall, the OC was contacted multiple times in an attempt to determine where SB-CS personnel were. The OC contacted SB-CS personnel at roughly 1435. The SB-CS Group Office contacted the field support operators, informing them there was a potential infraction at TA-55. The field support operators gathered notebooks, references, and dosimeters and headed to the group Government-Owned Vehicle (GOV), which was parked about 1/4 mile away from TA-03-332 at TA-03-1402 parking garage. The walk from the office to the parking garage took 10 minutes. They didn't know where in the parking garage (3-story) the GOV was parked and additional time was required to locate it. They drove 5 miles to TA-55 and parked at TA-50 Pajarito parking lot and walked to PF-4. They arrived at the doors to the affected room at approximately 1515.

The OC paged the FOD, the Deputy FOD, and the Operations Manager at approximately 1425. The FOD was attending a critique and the Deputy FOD was attending to a PF-4 tour. The

Operations Manager was in a meeting with DOE Los Alamos Site Office (LASO) at their offices at TA-03-1410. At approximately 1530, the Operations Manager arrived at the affected room. The red light was turned off and the Recovery Team, which requires someone from SB-CS and the FOD's office, entered the room and determined that no further recovery actions were necessary. The NCO-1 Group Leader and W2 then entered with the Recovery Team and verified the material for the glovebox was all accounted for and that the material was in the proper configuration to meet the CSLAs. The glovebox was then posted Out-of-Service (OOS) until after the critique.

A critique was held on August 15, 2011. At this critique, further information was brought to light concerning the processes of authorization for work in a specific glovebox, the appropriate response to a potential CSL infraction, and timely and complete communications. The TA-55 FOD declared this event a Management Concern, Significance Category 3.

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16. Is Subcontractor Involved? No

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17. Operating Conditions of Facility at Time of Occurrence:

Normal

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18. Activity Category:

03 - Normal Operations (other than Activities specifically listed in this Category)

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19. Immediate Actions Taken and Results:

1) W1 returned all items to their previous places.
2) W2 contacted her immediate supervisor, who in turn contacted the OC.
3) Personnel evacuated the room after leaving other processes in a safe configuration and the room was red-lit to control access.
4) The SB-CS personnel and Operations Manager were contacted and responded to the room, recommending to the FOD that no further recovery actions were necessary at that time.
5) The glovebox was tagged OOS for the immediate future.
6) A critique was held on August 15, 2011, at which time the FOD declared this event reportable as a Management Concern, Significance Category 3.
7) An All-Hands meeting concerning this event and criticality safety in general was held on August 22, 2011, followed by breakout sessions with recorded attendance.
8) A PF-4 Criticality Safety Improvement Working Group was established on August 23, 2011.

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20. ISM:

3) Develop and Implement Hazard Controls
4) Perform Work Within Controls

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21. Cause Code(s):

A3B3C05 - Incorrect assumption that a correlation exists between two or more facts
-->couplet - A2B4C01 - Material handling LTA
A3B1C04 - Infrequently performed steps are performed incorrectly
-->couplet - A6B2C01 - Practice or "hands-on" experience LTA
A3B1C06 - Wrong action selected based on similarity with other actions
A3B2C02 - Signs to stop were ignored and step performed incorrectly
-->couplet - A5B2C05 - Ambiguous instructions / requirements
A3B3C01 - Attention was given to wrong issues
-->couplet - A5B4C01 - Communication between work groups LTA
A4B1C01 - Management policy guidance / expectations not well-defined, understood or enforced
A5B3C01 - Lack of written communication
A5B3C02 - Not available or inconvenient for use
A6B2C02 - Testing LTA
A6B3C02 - Inadequate content

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22. Description of Cause:

Integrated Safety Management (ISM) Analysis: This event brought to light several processes that were not formalized (Glovebox Owner List, Programmatic POD, glovebox work authorization, permission to perform work, etc.) [Step 3 Develop and Implement Hazard Controls]. Additionally, several steps during the photography task were not performed in accordance with existing work procedures and protocols [Step 4 Perform Work Within Controls].

Root Cause Analysis
Root Cause Analysis and the Causal Analysis Tree as described in the DOE Occurrence Reporting Causal Analysis Guide (DOE G 231.1-2) were used to identify the causes of this event. Causes are identified as the most probable causes of an event or condition that management has the control to fix and for which effective recommendations for corrective actions can be generated.

Direct Cause
W1 saw the posted CSLAs on the glovebox, but failed to read them before placing his hands in the glovebox [A3B2C02 Signs to stop were ignored and step performed incorrectly].

Root Causes
The FMH Certification Program covered the ability to read, understand, and implement posted CSLAs. It also covered the correct response when a potential criticality issue was discovered. However, this program had weaknesses in three areas: 1) Each group qualified and certified their own people instead of utilizing independent Central Training personnel or an oral certification board [A6B2C02 Testing LTA]; 2) The two-year assessment of the training program did not at the time of this event have a mechanism to feed in LLs, procedure changes, etc, which would mature the program [A6B3C02 Inadequate content]; and 3) The quarterly proficiency for each FMH certified worker consisted of a qualified OJT Instructor/FMH Evaluator watching the

worker perform a single material movement correctly or verifying their FMH training was current [A6B2C01 Practice or hands-on experience LTA].

W1 made several incorrect correlations between his normal work environment and the work environment of this event; in his normal work environment, a single glovebox is a single location, he normally works with very small quantities, and he had not seen an angle-iron delimiter before. Additionally, he had seen the items of this event all together in a single location, as a single item [A3B3C05 Incorrect assumption that a correlation existed between two or more facts]. The fact items were stored in slip-top canisters was an interaction control and a computation assumption for criticality safety. In this event, the items were removed from their canisters for photography and placed together on the glovebox floor [A2B4C01 Material handling LTA coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].

Having all items in one LANMAS location became an overmass situation [A2B4C01 Material handling LTA coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].
The delimiter was not attached to the glovebox. The delimiter itself was an angle iron bar wrapped with yellow and black tape. This delimiter was set on top of the corresponding yellow and black tape that denoted the boundaries of the two existing LANMAS locations in the glovebox. The delimiter was not secured to the glovebox in order to allow for easy cleaning underneath it and for future flexibility of the glovebox. While delimiters were not a common feature, the tape boundaries between LANMAS locations were common. In this event, the delimiter was moved and used in the photography task [A3B3C01 Attention was given to wrong issues coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].

Contributory Causes
W1 had seen all the material in a single location previously when it was being cast and therefore, did not believe there to be an issue in placing all items in close proximity for photographs [A3B1C06 Wrong action selected based on similarity with other actions].

This was the first criticality issue in which W2 and W1 were directly involved in the response [A3B1C04 Infrequently performed steps were performed incorrectly]; in suggesting to W1 that he put the items back, the direction to pause work was not followed. Not all Casting Operators were informed of the situation until 20-30 minutes later when managers arrived at the room, responding to the criticality safety issue [A5B4C01 Communication between work groups LTA]. Form Appendix G, from TA55-DOP-016 was being used for glovebox work authorization, which was beyond its intended scope [A5B2C05 Ambiguous instructions/requirements]. ADPSM-NOTICE-002 specifically states that further direction would be forthcoming, in order to clarify and provide further direction concerning glovebox ownership; no further direction or guidance could be located [A5B2C05 Ambiguous instructions/requirements]. No owner of the Glovebox Owner List was assigned for completing, verifying, and maintaining the list [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced]. The Glovebox Owner List was not available to the general PF-4 worker [A5B3C02 Not available or inconvenient for use]. ADPSM-NOTICE-002 requires that the glovebox owner have

knowledge of work activities occurring in their gloveboxes. However, this investigation could find no work document directing how permission from glovebox owner to worker should be carried out [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced].

The Programmatic POD was informal. This investigation could not locate any work document that governed the implementation and use of the Programmatic POD [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced]. Some work groups, such as NCO-1, used the Programmatic POD to track all activities, including tasks like photography. There was no required attendance, and as such, the Programmatic POD had been known to be canceled for days at a time, even with minor work activities still occurring [A5B3C01 Lack of written communication].

Barrier Analysis

The Barrier Analysis method allows one to compare barriers, thereby assessing which barriers failed to work properly. The DOE Causal Analysis Tree was used to identify causal factors associated with deficient and/or absent events and conditions.

Training

The FMH Certification Program covered the ability to read, understand, and implement posted CSLAs. It also covered the correct response when a potential criticality issue is discovered. However, this program had weaknesses in three areas: 1) Each group qualified and certified their own people instead of utilizing independent Central Training personnel or an oral certification board [A6B2C02 Testing LTA]; 2) The two-year assessment of the training program did not at the time of this event have a mechanism to feed in Lessons Learned (LLs), procedure changes, etc, which would mature the program [A6B3C02 Inadequate content]; and 3) The quarterly proficiency for each FMH certified worker consisted of a qualified On-the-Job-Training (OJT) Instructor/FMH Evaluator watching the worker perform a single material movement correctly or verifying that their FMH training was current [A6B2C01 Practice or hands-on experience LTA].

Work Documents

TA55-DOP-016, TA55 Material Transfer Procedure, provided instructions on the proper methods for handling and transferring SNM in PF-4 and outside PF-4 for the waste storage pad and Bolas Grande storage area at TA-55. Under 9.2, Group Leaders/FLMs were to ensure personnel were trained to the requirements of the CSLA and/or Material At Risk (MAR) limits prior to authorizing them to be designated to receive material into a location. Additionally, they were to assume overall responsibility for the activity and ensure that equipment and personnel were ready and qualified. The Form Appendix G, Authorization Form for Workers to Receive Material per Location, authorized listed personnel to receive material at the listed locations. Typically, the Group Leader or FLM would walk down the hazards of the location with personnel and then sign off on the form. From there, the form was turned into the Group Office and filed. This procedure and form were, in practice, being used to authorize individual workers to perform work in general in gloveboxes. There was no allotted space on the form for the individual workers to sign and they did not receive a copy of it. The information on who was

authorized to work in each glovebox was not kept in a maintained database, but rather on these paper forms in a file. It was the Glovebox Owner, usually a FLM, who provided the CSLA and MAR briefing on the glovebox to the individuals and signed off on the form. In this case, the Glovebox Owner was not the FLM for either W1 or W2. Form Appendix G was being used for glovebox work authorization, which was beyond its intended scope [A5B2C05 Ambiguous instructions/requirements].

ADPSM-NOTICE-002, ADPSM Material, Glovebox, and Configuration Ownership in PF-4, was issued in March 2011. In this Notice, NCO Division was made responsible for SNM in processing rooms, all material movements, process operations required to satisfy Integrated Program Management (IPM) deliverables, and understanding and complying with criticality and MAR limits and Material Control and Accountability (MC&A) requirements. All non-NCO personnel work with SNM was to be conducted with NCO cognizance and approval only. NCO was made responsible for every glovebox except those operated by MST-16, Actinide Analytical Chemistry Group (C-AAC), and Water Services Group (NPI-7). NCO was to assign a specific individual as the owner of each glovebox in PF-4. This Notice specifically stated that further direction would be forthcoming, in order to clarify and provide further direction concerning glovebox ownership; no further direction or guidance could be located [A5B2C05 Ambiguous instructions/requirements]. This Notice was a required Read and Sign and both W1 and W2 completed the Read and Sign. It was distributed by attaching to the Shift Orders and was available in the Document Control System (DCS) Documentum.

TA55-AP-522, Nuclear Criticality Safety, described the administrative nuclear criticality safety practices at TA-55. Under Section 4.6 Suspected Process Deviation, if a criticality safety control had been compromised, workers were to pause work, make no attempt to recover from the situation, back away at least 15 feet, warn others in the area, control access, notify supervisors and the OC, and await further instructions in a safe location. In this case, W1 replaced all items to original configuration per suggestion of W2 [A3B1C04 Infrequently performed steps were performed incorrectly]. W2 notified her supervisor, who in turn made notification to the OC and other supervisors. W2 warned the nearest NCO-1 Casting Technicians along with the Casting Lead Engineer. However, not all Casting Technicians were informed of the situation until 20-30 minutes later when managers arrived at the room, responding to the criticality safety issue [A5B4C01 Communication between work groups LTA]. W2 remained in the room until managers arrived, ensuring personnel were at least 15 feet from the affected glovebox. However, a NCO-1 Technician, who was performing the LANMAS transactions for the casting operations, was sitting at the LANMAS station near the affected glovebox until the managers arrived, not realizing there was a criticality safety issue [A5B4C01 Communication between work groups LTA]. TA55-AP-522 directed personnel to pause work but did not specify if that was for the affected LANMAS location, glovebox, or room.

Materials and Equipment

W1 made several incorrect correlations between his normal work environment and the work environment of this event; in his normal work environment, a single glovebox is a single location, he normally works with very small quantities, and he had not seen an angle-iron delimiter before. Additionally, he had seen the items of this event all together in a single location, as a single item [A3B3C05 Incorrect assumption that a correlation existed between two

or more facts]. The fact items were stored in slip-top canisters was an interaction control and a computation assumption for criticality safety. In this event, the items were removed from their canisters for photography and placed together on the glovebox floor [A2B4C01 Material handling LTA coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].

Having all items in one LANMAS location became an overmass situation [A2B4C01 Material handling LTA coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].
The delimiter was not attached to the glovebox. The delimiter itself was an angle iron bar wrapped with yellow and black tape. This delimiter was set on top of the corresponding yellow and black tape that denoted the boundaries of the two existing LANMAS locations in the glovebox. The delimiter was not secured to the glovebox in order to allow for easy cleaning underneath it and for future flexibility of the glovebox. While delimiters were not a common feature, the tape boundaries between LANMAS locations were common. In this event, the delimiter was moved and used in the photography task [A3B3C01 Attention was given to wrong issues coupled with A3B3C05 Incorrect assumption that a correlation existed between two or more facts].

Management Systems
While ADPSM-NOTICE-002 indicated that a glovebox owner would be assigned to each glovebox in PF-4, no information was provided in this Notice on a Glovebox Owner List. The NCO Division Leader was tasked with developing this list. The NCO-2 Group Leader was tasked by the NCO Division Leader with working with the MEL Engineer to use glovebox information from the MEL to create the basis for the Glovebox Owner List. This done, the list was provided back to the NCO Division Leader and the FOD's office. No owner of the list was assigned for completing, verifying, and maintaining the list [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced]. The Glovebox Owner List was not available to the general PF-4 worker [A5B3C02 Not available or inconvenient for use]. ADPSM-NOTICE-002 required that the glovebox owner have knowledge of work activities occurring in their gloveboxes. However, this investigation could find no work document directing how permission from glovebox owner to worker should be carried out [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced]. In practice, such permission was informal; verbal, per email, or per the Programmatic POD.

Knowledge and Skills
In W1's usual work environment, his gloveboxes did not have multiple LANMAS locations; each glovebox was its own location. Additionally, he often worked with amounts that were less than accountable and therefore, did not require a LANMAS transaction before moving from one location to another. He was not trained and qualified to perform LANMAS transactions, as was not uncommon for many glovebox workers. His usual gloveboxes did not have angle iron delimiters. In this event, this was the first angle iron delimiter he had seen. W1's routine work environment was significantly different from the work environment of the event. W1 had seen all the material in a single location previously when it was being cast and, therefore, did not believe there to be an issue in placing all items in close proximity for photographs [A3B1C06 Wrong action selected based on similarity with other actions]. W1 was not authorized to perform work

in the glovebox where this event occurred. W1 saw the posted CSLAs on the glovebox, but failed to read them before placing his hands in the glovebox [A3B2C02 Signs to stop were ignored and step performed incorrectly].

While W2 has worked in gloveboxes for a few years, this was her first project in which she was Lead Engineer. This was the first criticality issue in which she and W1 were directly involved in the response [A3B1C04 Infrequently performed steps were performed incorrectly]; in suggesting to W1 that the items were put back, the direction to pause work (TA55-AP-522) was not followed. W2 was authorized to perform work in this glovebox.

Communications
TA-55 at the time of this event had two PODs. The Institutional POD (IPOD) was formalized and well understood and implemented. The Programmatic POD was informal. This investigation could not locate any work document that governed the implementation and use of the Programmatic POD [A4B1C01 Management policy guidance/expectations not well-defined, understood or enforced]. Some work groups, such as NCO-1, used the Programmatic POD to track all activities, including tasks like photography. There was no required attendance, and as such, the Programmatic POD had been known to be canceled for days at a time, even with minor work activities still occurring [A5B3C01 Lack of written communication]. Photography was a common task for MET-2 and had routinely been captured under General Foundry Activities on the Programmatic POD in the past.

Once it was determined that there was a potential criticality issue, this was not communicated to everyone in the room [A5B4C01 Communication between work groups LTA]. Independent interviews showed a variety of understanding of the situation among the personnel; some personnel understood that a potential criticality issue was present and knew to stay back at least 15 feet, some were aware that an issue had arisen but did not know it was a criticality issue, and others were unaware of an issue at all until managers arrived at the room and asked personnel to leave due to a criticality issue.

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23. Evaluation (by Facility Manager/Designee):

This event exemplifies the importance of a robust training certification process for complex operations where the consequences of a human error could be significant.

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24. Is Further Evaluation Required?: No

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25. Corrective Actions

(* = Date added/revised since final report was approved.)

1. REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Glovebox Owner List Action Description: Formalize the Glovebox Owner List and make readily available to PF-4

workers and management. Responsible Organization: ADPSM and NCO-2 Deliverable: Formalized, published Glovebox Owner List	
Target Completion Date: 09/22/2011	**Completion Date:** 09/22/2011

2. | | |
|---|---|
| REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Major Revision of TA55-AP-522 Action Description: TA55-AP-522 will be revised to clarify Roles and Responsibilities (R&Rs) concerning findings identified in the 2011 Nuclear Criticality Safety Board (NCSB) audit. TA55-AP-522 will be brought into compliance with SD 130, Nuclear Criticality Program. This will include the R&Rs of glovebox work authorization. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Revised and published TA55-AP-522 | |
| **Target Completion Date:** 10/14/2011 | **Completion Date:** 10/14/2011 |

3. | | |
|---|---|
| REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Revise TA55-DOP-016 Action Description: TA55-DOP-016 will be revised to clarify R&Rs relative to material movements in PF-4. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Revised and published TA55-DOP-016 | |
| **Target Completion Date:** 11/11/2011 | **Completion Date:** 11/03/2011 |

4. | | |
|---|---|
| REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Revamp PF-4 FMH Certification Requirements Action Description: The PF-4 Criticality Safety Improvement Working Group will work with TA-55 Training Personnel to revamp the PF-4 FMH Certification Requirements. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Documented changes to the FMH Program | |
| **Target Completion Date:** 10/28/2011 | **Completion Date:** 10/28/2011 |

5. | | |
|---|---|
| REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Qualify PF-4 FMH personnel to Revamped FMH Certification Requirements Action Description: PF-4 FMH personnel will be trained, qualified, and certified to the revamped FMH Certification requirements. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Documented training, qualification, and certification of PF-4 FMH personnel to revamped FMH Certification requirements. | |
| **Target Completion Date:** *01/30/2012 | **Completion Date:** 01/30/2012 |

6. | | |
|---|---|
| REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: PF-4 Criticality Safety Officer (CSO) Position Action Description: Evaluate the establishment of PF-4 CSO as a full-time position. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Documented evaluation and actions based upon evaluation. | |
| **Target Completion Date:** 12/05/2011 | **Completion Date:** 10/28/2011 |

7. REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: PF-4 Room/Wing Controller Position Action Description: Evaluate the establishment of PF-4 room/wing controller as a full-time position. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Documented evaluation and actions based upon evaluation.

Target Completion Date: 12/05/2011	**Completion Date:** 10/28/2011

8. REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: SD 130-Compliant TA-55 Criticality Safety Program Action Description: TA-55 will fully implement a SD 130-compliant Criticality Safety Program, including implementation of TA55-AP-522. Responsible Organization: Criticality Safety Working Group Chair Deliverable: Documented implementation through an independent review.

Target Completion Date: *08/31/2012	**Completion Date:** 08/16/2012

9. REVISION OR EXTENSION OF THIS ACTION REQUIRES FACILITY OPERATIONS DIRECTOR (FOD) APPROVAL. Title: Effectiveness Review of Revamped FMH Certification Requirements Action Description: An Effectiveness Review of the revamped FMH Certification requirements will be performed. Responsible Organization: NPI-5 Operations Support Conduct of Operations Deliverable: Documented Effectiveness Review.

Target Completion Date: 05/30/2012	**Completion Date:** 01/30/2012

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26. Lessons Learned:

This event exemplifies the importance of a robust training certification process for complex operations where the consequences of a human error could be significant. If multiple organizations manage personnel under the same certification process, then line management from each organization should participate, as voting members, on a consolidated Oral Board. Executing the certification process organizationally, separately for one another, enables inconsistencies in the acceptance measures and/or standards presented to the candidates.

Managers must also be sensitive to potentially broad spanning "Certified Worker" duty areas. As such, management needs ensure that the Proficiency Requirements for each worker must cover the key attributes associated with the entire authorized duty area. Workers who cannot demonstrate proficiency across the entire duty area, through their daily assignments, must be afforded a smaller duty area(s) commensurate with their normal duties.

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27. Similar Occurrence Report Numbers:

NA--LASO-LANL-TA55-2010-0010

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28. User-defined Field #1:

SJV

29. User-defined Field #2:

PFITS ID: 2011-3299

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30. HQ Keyword(s):

14E--Quality Assurance - Work Process Deficiency
14A--Quality Assurance - Program Deficiency
14B--Quality Assurance - Training and Qualification Deficiency
14D--Quality Assurance - Documents and Records Deficiency
14H--Quality Assurance - Inspection and Acceptance Testing Deficiency
14I--Quality Assurance - Management Assessment Deficiency
01F--Inadequate Conduct of Operations - Training Deficiency
01G--Inadequate Conduct of Operations - Inadequate Procedure
01J--Inadequate Conduct of Operations - Criticality Procedure Noncompliance
01N--Inadequate Conduct of Operations - Inadequate Job Planning (Other)
12L--EH Categories - Nuclear Criticality Safety Concern
13A--Management Concerns - HQ Significant (High-lighted for Management attention)
01A--Inadequate Conduct of Operations - Inadequate Conduct of Operations (miscellaneous)
01P--Inadequate Conduct of Operations - Inadequate Oral Communication
01R--Inadequate Conduct of Operations - Management issues

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31. HQ Summary:

On August 11, 2011, Technical Area 55 personnel working in a room of the 300-Area of Building PF-4 realized that a potential Criticality Safety Limit (CSL) infraction had occurred. A Nuclear Materials Science Group worker was working in a glovebox and had moved items into one end of the glovebox to facilitate photographing, and inadvertently exceeding the posted Criticality Safety Limit Approval. The Pit Integrated Technologies Group engineer recognized the issue upon entering the room and immediately asked the worker to return all items to their previous locations while she began notifications of a potential CSL infraction. The room was evacuated and access controlled until Safety Basis Criticality Safety Group personnel could assess the situation. It was determined that no hazard existed at that point and the room was released for normal operations. At the critique, further information was brought to light concerning the processes of authorization for work in a specific glovebox, the appropriate response to a potential CSL infraction, and timely and complete communications.

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32. DOE Facility Representative Input:

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33. DOE Program Manager Input:

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34. Approvals:

Approved by: Robert Mason, Facility Manager/Designee
Date: 10/31/2011
Telephone No.: (505) 667-3030  (505) 667-3030