



Department of Energy
Savannah River Operations Office
P.O. Box A
Aiken, South Carolina 29802

DEC 21 2018

The Honorable Bruce Hamilton
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Chairman Hamilton:

SUBJECT: Transmittal of Defense Nuclear Facilities Safety Board (DNFSB) Recommendation
2012-1 Implementation Plan (IP) Annual Report for Fiscal Year (FY) 2018

This letter transmits the Annual Report committed in Section 6 of the Department's IP.

We will continue to work with your staff to effectively respond to the concerns raised in the recommendation and complete the IP.

If you have any questions please contact me, or have your staff contact Michael Mikolanis, Assistant Manager Nuclear Materials Stabilization at (803) 208-3927.

Sincerely,

A handwritten signature in blue ink, appearing to read "M. D. Budney".

Michael D. Budney
Savannah River Site Manager

NMPD-19-0014

2 Enclosures:

1. FY 2018 Annual Report for the
United States Department of
Energy IP for DNFSB
Recommendation 2012-1
2. 2018 Building 235-F Exercise
After Action Report

Honorable Hamilton

2

cc w/encls:

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Enclosure 1: Letter, Budney to Hamilton,
SUBJECT: Transmittal of
DNFSB Recommendation 2012-
1 Implementation Plan Annual
Report for Fiscal Year 2018
DATE:

**Fiscal Year 2018
Annual Report
for the
United States Department of Energy
Implementation Plan
for
Defense Nuclear Facilities Safety Board
Recommendation 2012-1**



Savannah River Site Building 235-F Safety

December 2018

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EXECUTIVE SUMMARY

This Annual Report fulfills the requirement of the United States Department of Energy (DOE) Implementation Plan (IP) for Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2012-1, *Savannah River Site (SRS) Building 235-F Safety*, Section 6.0 which states:

“To ensure that the various departmental implementing elements and the Board remain informed of the status of plan implementation the Department will provide an annual, written report that identifies commitments completed during the year and summarizes progress made that year on open commitments.”

This Annual Report addresses the following specific IP Actions:

Action 1-7: Revise the Hazard Analysis, and if necessary the Building 235-F Deactivation Basis for Interim Operation (BIO) to include deactivation activities in Plutonium Fuel Form (PuFF) Cells 1 through 5.

Action 1-8: If needed complete a Readiness Assessment (RA) for initiation of deactivation activities in PuFF Cells 1 through 5 and implement the revised Deactivation BIO.

Action 1-9: Using enhanced characterization techniques identify a list of significant components and/or equipment to be removed for Material at Risk (MAR) reduction in Cells 1 through 5.

Action 1-11: Restore cell infrastructure in PuFF Cells 1 through 5.

Action 1-13: Update planning schedule to reflect PuFF Cells 1 through 5 deactivation actions for the upcoming 12 months.

Action 3-3: Develop an updated F-Area drill plan that explicitly includes the participation expectations, for all facilities and construction sites surrounding Building 235-F and planned drill dates. Annual updates are expected to be provided in December each calendar year until the hazard is removed or mitigated.

Action 3-4: Execute at least one formally assessed drill each year based on a radiological release from Building 235-F that includes successful demonstration of the ability to adequately protect workers in all facilities and construction sites surrounding Building 235-F. Annual updates are expected to be provided in December each calendar year until the hazard is removed or mitigated.

The DOE entered Fiscal Year (FY) 2018 under a Continuing Resolution which again restricted the funding available for DOE Savannah River Operations Office (SR) projects including 235-F Risk Reduction. Despite this challenge DOE-SR continued to allocate funds for the project. Funding was provided for continuing technical development and work planning to support the beginning of Material at Risk MAR removal.

Attachment 1 contains a table that lists IP Actions completed, and those to be completed in FY 2019 and beyond.

FY 2018 PROGRESS

DOE-SR made significant progress preparing for the initiation of deactivation activities, including substantial field progress. The key accomplishments in FY 2018 are as follows:

Deactivation BIO Implementation: The Building 235-F Deactivation BIO Revision 3, and Technical Safety Requirements Revision 3 were approved by DOE on November 3, 2017, and Savannah River Nuclear Solutions (SRNS) completed implementation on February 2, 2018. This completed milestone 1-7, *Revise the hazard analysis, and if necessary the Building 235-F Deactivation BIO to include deactivation activities in PuFF Cells 1 through 5*. The Department determined a RA was not required prior to initiation of deactivation activities in PuFF Cells 1 through 5. The first waste cut, and removal of MAR from the Cell 1 wing cabinet was completed on October 17, 2018. This action initiating MAR removal completed milestone 1-8, *If needed, complete a RA for initiation of deactivation activities in PuFF Cells 1 through 5, and implement the revised Deactivation BIO*.

Enhanced Characterization: Enhanced characterization measurements were completed for the wing cabinets attached to cells in East Maintenance. This involved Savannah River Nuclear Laboratory (SRNL) taking its final set of radiation measurements to gather data needed for a final report on the Non-Destructive Assay results in the PuFF cells and wing cabinets. This concluded the initial characterization of the PuFF cells and attached wing cabinets. This enhanced characterization information was used to generate the “Scoping Document for Material Removal from Cells 1 & 2 And East Maintenance Gloveboxes Within The 235-F PuFF Facility” (M-ESR-F-00296), and the “Scoping Document for Material Removal from PuFF Facility Cells 3-5 Within Building 235-F” (M-ESR-F-00282). These activities completed IP milestone 1-9, *Using enhanced characterization techniques identify a list of significant components and/or equipment to be removed for MAR reduction in cells 1-5*.

Electrical and Mechanical Isolation of cells: Electrical and mechanical isolation of PuFF Cells 1 and 2 along with the associated wing cabinets was completed. This ensures that, to every extent practical, electrical or mechanical lines penetrating the cells have been isolated.

Wing Cabinet Window Remediation in East Maintenance: Restoring visibility in the cells included the removal of the outer window assembly and the four-inch-thick gelatin filled container. After the gel filled container was removed a protective barrier was installed to protect the inner window from damage. Window remediation was required to restore visibility, and to allow enhanced characterization to be performed. These activities complete IP milestone 1-11, *Restore cell infrastructure in PuFF Cells 1 through 5*.

Fire Dam: The Risk Reduction project team is working with SRNL, and Florida International University to test an incombustible fixative in the Puff Facility. The project tested the application methods in the mockup prior to applying the fixative in Cell 7 and the entry hood of Cell 1. SRNL will monitor the fixative to better understand how the material holds-up in a Pu 238 environment.

Use of the Mock-up. The mock-up continues to be used to refine techniques and keep the operators proficient on tasks that will be performed in the facility.

PLANNED ACTIVITIES FOR FY 2019

Funding has been allocated to the 235-F project for FY 2019. The key activities scheduled to occur throughout FY 2019 are listed below:

1. Remove MAR from Cells 1-5 including attached wing cabinets.
2. Characterize material removed and package waste for shipment to E-Area.
3. Ship waste to E-Area for storage until shipment to Waste Isolation Pilot Plant resumes.

ANNUAL UPDATE ON DRILL PERFORMANCE

Action 3-4, Drill Conduct and Evaluation

On May 3, 2018, the SRS conducted the FY 2018 Site Evaluated Exercise, which also served as the required deliverable for Action 3-4 identified in the IP for the DNFSB Recommendation 2012-1, *SRS Building 235-F Safety*. Participants included the SRS Emergency Response Organization (ERO), and Centerra LLC, SRS (Centerra-SRS).

The drill scenario was based on a vehicle accident involving a fuel truck, and a transport truck containing Transuranic waste drums being transferred to Solid Waste. The fuel truck driver experienced a stroke which caused the fuel truck to collide with the transport truck. The collision resulted in the transport truck catching fire. The fire spread to the waste containers causing the containers to rupture. The driver of the transport truck was injured while exiting the burning truck. The event was classified as a Site Area Emergency, resulting in the activation of the site's Emergency Operations Center. The ERO for F-Area as well as the site-level ERO responded to the emergency, mitigated the situation, and planned for recovery and return to operation.

The Site Exercise was completed with a grade of "Met". The overall performance of personnel assigned to F-Area indicted that the facility's ERO including the Technical Support Staff can respond effectively to a radiological release from Building 235-F and implementing protective actions to protect personnel in adjacent facilities and construction sites. Improvement opportunities were identified in the After-Action Report in the areas of:

Incident Scene Preparation:

Training aids should be labeled properly to reduce any risk of a contaminated drum or container being used, and proper tools should be used to minimize any safety issues. The drum intended for use in the drill was not properly marked as a training drum.

Incident Scene Command and Control:

Upon assuming a role, personnel should announce their position to reduce confusion.

Radiological Controls:

Markings or other identifiers should be used to differentiate the “Clean/Contaminated” areas when a decontamination zone is not able to be set up. The boundary initially set up to identify areas as clean or contaminated was not well defined.

Situational Awareness:

All personnel at the scene should use situational awareness to ensure that the contamination is not spreading to the location of emergency response personnel and vehicles.

Attachment 1

Table of IP Actions Completed and Planned

Action	IP Milestones Completed	Due Date	Date Completed
1-1	Complete project deactivation planning for PuFF Cells 1-9.	05/30/13	05/21/13
1-2	Issue the Building 235-F Deactivation BIO (which superseded the Surveillance & Maintenance (S&M) BIO) to include deactivation activities in PuFF Cells 6 through 9.	07/30/18	10/31/13
1-3	Restore cell infrastructure in PuFF Cells 6 through 9.	07/31/13	01/28/16
1-4	Complete a RA for initiation of deactivation activities in PuFF Cells 6 through 9 and implement the Deactivation BIO.	05/31/16	07/10/15
1-5	Update planning schedule to reflect PuFF Cells 1 through 5 deactivation actions for the upcoming 12 months.	12/31/13	12/09/13
1-6	Update planning schedule to reflect PuFF cells 1 through 5 deactivation actions for the upcoming 12 months.	01/30/15	12/31/14
1-7	Revise the Hazard Analysis and if necessary the Building 235-F Deactivation BIO to include deactivation activities in PuFF Cells 1 through 5.	04/30/18	11/03/17
1-8	If needed complete a RA for initiation of deactivation activities in PuFF Cells 1 through 5 and implement the revised Deactivation BIO.	07/31/18	10/17/18
1-9	Using enhanced characterization techniques identify a list of significant components and/or equipment to be removed for MAR reduction in Cells 1 through 5.	01/31/19	08/08/18
1-10	Update planning schedule to reflect PuFF cells 1 through 5 deactivation actions for the upcoming 12 months.	01/29/16	12/22/15
1-11	Restore cell infrastructure in PuFF Cells 1 through 5.	11/30/18	08/10/18
1-12	Update planning schedule to reflect PuFF Cells 1 through 5 deactivation actions for the upcoming 12 months.	01/31/17	12/31/16
1-13	Update planning schedule to reflect PuFF cells 1 through 5 deactivation actions for the upcoming 12 months.	01/31/18	12/31/17
2a-1	Development of Building 235-F Specific Transient Combustible Control Program.	02/15/13	01/28/13
2a-2	Evaluate fixed combustibles and define the fixed combustible removal, encapsulation, or isolation scope.	03/4/13	02/13/13
2a-3	Complete removal, encapsulation or isolation of fixed combustibles scope.	01/30/15	09/24/14
2b-1	Evaluate electrical components and define the scope for de-energization of components and the process for control of the resultant configuration.	03/4/13	02/13/13
2b-2	Complete electrical de-energization scope, including equipment removal, as practical.	01/30/15	09/24/14
2c-1	Complete evaluation of existing FDAS for functionality and maintainability.	Complete*	10/30/12
2c-2	Develop a Fire Alarm and Detection Design Study that will recommend the PuFF FDAS system design enhancements (to include criteria, scope, and schedule) for S&M and deactivation phases.	04/1/13	03/4/13
2c-3	Complete installation and acceptance testing of the PuFF FDAS for S&M and deactivation phases.	01/30/15	01/30/15
3-1	Develop a Calendar Year (CY) 2013 drill schedule for F-Area detailing planned drill dates involving Building 235-F including participation by all facilities and construction sites surrounding Building 235-F.	01/31/13	01/31/13
3-2	Perform review of existing protective action plans and procedures to ensure that personnel are protected from the hazards associated with a radiological release from Building 235-F, and implement additional controls, as required.	02/28/13	02/13/13

Action	IP Milestones Completed (continued)	Due Date	Date Completed
3-3	Develop an updated F-Area drill plan that explicitly includes the participation expectation for all facilities and construction sites surrounding Building 235-F and planned drill dates. Continue to include in F-Area drill plan until the hazard is removed or mitigated. <i>Annual updates will be provided in December of each year until the hazard is removed or mitigated.</i>	12/31/18	11/27/18
3-4	Execute at least one formally assessed drill each year based on a postulated radiological release from Building 235-F that includes successful demonstration of the ability to adequately protect workers in all facilities and construction sites surrounding Building 235-F. <i>Annual updates will be provided in December of each year until the hazard is removed or mitigated.</i>	12/31/18	05/03/18

*Action 2c-1 was completed prior to issuance of the IP

Action	IP Milestones Remaining to be Completed	Due Date	Date Completed
1-14	Complete the deactivation of cells 1 through 9. This will include waste removal.	01/31/20	
1-15	Using enhanced characterization techniques derive a final [Post Deactivation] MAR value to be used for end-state selection and regulatory acceptance. This will demonstrate mitigation of the hazard and resultant risk reduction.	06/30/20	
1-16	Revise the 235-F Deactivation BIO once the MAR is removed and acknowledge the facility meets the requirements of 10 CFR Part 830 to protect the maximally exposed off-site individual to within the established DOE-S TD-3309 evaluation guidelines and protect the co-located and facility worker within the accepted SRS guidelines of 100 rem.	05/31/21	
3-3	Develop an updated F-Area drill plan that explicitly includes the participation expectation for all facilities and construction sites surrounding Building 235-F and planned drill dates. Continue to include in F-Area drill plan until the hazard is removed or mitigate. <i>Annual updates will be provided in December of each year until the hazard is removed or mitigated.</i>	12/31/19	
3-4	Execute at least one formally assessed drill each year based on a postulated radiological release from Building 235-F that includes successful demonstration of the ability to adequately protect workers in all facilities and construction sites surrounding Building 235-F. <i>Annual updates will be provided in December of each year until the hazard is removed or mitigated.</i>	12/31/19	

**Attachment 2
2019 F-Area Complex EP Drill Schedule**

Emergency Preparedness Coordinator: Deborah Quiller
Facility Point of Contact: Alan Mulligan

Date	April 16, 2019
Type	<p align="center">235-F Radiological Release with Protective Actions (Evaluated)</p> <p align="center">(MOX and SRR will be invited to participate)</p>

Approval: Alan Mulligan
F-Area Complex Operations Manager


Signature

11/27/2018
Date

Enclosure 2: Letter, Budney to Hamilton,
SUBJECT: Transmittal of
DNFSB Recommendation 2012-
1 Implementation Plan Annual
Report for Fiscal Year 2018
DATE:

May 9, 2018

SRNS-C3400-2018-00021

TO: Lakela C. Lofton, 704-L
Jack L. Mooneyhan, 707-F
Glen A. Mulligan, 772-F
Scott E. Neudigate, 707-F
Thomas J. Diaz, 703-45A

FROM: Rafael Bango, 773-65A
Bobby R. James, 773-66A

235-F Emergency Preparedness (EP) Exercise After Action Report

Executive Summary

An EP Evaluated Exercise was conducted on May 3, 2018 at 0800 in 235-F for F-Area Complex Shift N1 personnel. The purpose of this Exercise was to evaluate the ability of the Emergency Response Organization (ERO) to respond to and mitigate a vehicle collision and fire involving a single Transuranic (TRU) waste drum, a medical injury, contamination of personnel, and a radiological release outside of 235-F.

Good Practices, Observations, Opportunities for Improvement, Deficiencies, and Findings were identified during the exercise debriefing and Controller Assessment which are indicated in the objectives section of this report. An assessment of Exercise performance was conducted. Ten of the eleven Performance Objectives were met. The Medical Performance Objective was not met. The Senior Observer for this exercise was Lakela Lofton, F-Area Complex Facility Manager, and the Lead Evaluator was Duane Mark Delmore, Department of Energy-Savannah River (DOE-SR).

Participants included:

- Savannah River Site Operations Center (SRSOC)
- F-Area Complex Facility ERO
- F-Area Complex Technical Support Room (TSR) Organization
- Centerra-Savannah River Site (Centerra-SRS)
- SRS Fire Department (SRSFD)
- DOE-Facility Representative (DOE-FR)
- DOE-SR

Exercise Scenario Scope

Operators and Radiological Protection Department (RPD) personnel had just completed loading a TRU waste drum onto a sample truck to transport the drum to the Solid Waste Management Facility (SWMF). There were two Operators, one spotter, and one RP Inspector (RPI) present, along with two truck drivers (total of six personnel). The barricades that were placed to block the area had been removed to allow the transport vehicle to leave. Simultaneously, the breathing air compressor was being refueled. After the fueling was completed, the driver entered the vehicle and began to pull off.

As the fuel vehicle began to pull off, the driver experienced a stroke. The driver, confused due to the stroke, steered the vehicle towards the exit near 720-F and the loading area for 235-F, where the vehicle containing the loaded TRU waste drum was pulling off towards the east exit. The two vehicles collided, rupturing the fuel line on the transport truck and causing ignition to the fuel on the transport truck. The fuel truck glanced off the transport truck and came to rest near the power pole, approximately 50 meters from the transport truck. The fuel truck was not on fire; however, the driver of the fuel truck was still inside of the vehicle.

The transport truck continued to burn, with the fire quickly engulfing the transport box containing the TRU waste drum. The driver of the transport truck jumped from the burning transport vehicle and rolled away from the vehicle, and severely sprained their right ankle.

The two Operators, spotter, and RPI saw the collision occur. The spotter and one Operator attended to the transport truck driver and assisted the driver in moving upwind from the burning transport truck. The RP Inspector and other Operator assisted the fuel truck driver to get out of the vehicle. The fuel truck driver was ambulatory with assistance, and was confused, disoriented, and had slurred speech. The RPD Inspector and Operator attempted to assist the driver, but the driver was confused and walked towards the burning transport truck. The driver then turned back towards the RPD Inspector and Operator and moved away from the fire.

One of the on-scene personnel contacted the F-Area Complex Control Room (CR) and RPD was notified of the event and the fire involving the single TRU waste drum. The pressure vent on the TRU waste drum was overwhelmed. The pressure within the TRU drum caused the lid on the drum to come off.

Based on data provided, the Shift Operations Manager (SOM), with concurrence from the Emergency Duty Officer (EDO), classified the event as a Site Area Emergency (SAE-1.3), *Single TRU Waste Container Fire, Unfiltered Release*, in accordance with L2-1-EPIP-001, *F Area Complex Facilities Emergency Classification*, Emergency Action Level (EAL) Attachment 8.3, *235-F Operational EAL Parameters*. The exercise was terminated once the opportunity had been provided for all objectives to be sufficiently demonstrated.

Exercise Performance Summary

This exercise evaluated ERO response to a simulated vehicle collision with a fire involving a single TRU waste drum and injury. Prior to exercise initiation, the Lead Controller verified the applicable procedures with Facility Management to allow for initiation of exercise. Player

briefings were conducted with F-Area ERO personnel and role players, with specific information regarding the initiation of the event being withheld to maintain scenario integrity.

The fuel truck and the transport truck pulled off at approximately the same time. The driver of the fuel truck experienced a stroke and his vehicle collided with the transport truck, igniting a fuel line on the transport truck. Upon realizing that the transport truck is on fire, the driver jumped and severely injured her right ankle. F-Area personnel at the scene who witnessed the traffic accident and ensuing fire quickly responded to the vehicles to check on and assist the drivers. As personnel check on the fuel truck driver, he got out of the truck and began to walk toward the transport truck, then turned around and walked away. As initial responders assisted both drivers to move away from the incident scene, one of the personnel contacted the CR and notified them of the vehicle accident, fire, and injuries. The initial responders observed the wind sock to determine direction (no wind) and proceeded to move uphill toward Gate F32; however, personnel did not notice the direction of travel of the smoke from the scene and walked into the smoke plume while evacuating from the incident scene near 235-F to Gate F32.

Upon arrival to Gate F32, initial responders attempted to provide assistance to the injured vehicle drivers, with the RPI at the scene performing surveys of the drivers and bystanders. The RPI also proceeded to assess the patients (drivers) for injuries and provide first aid while waiting for the arrival of first aid responders and Savannah River Site Fire Department (SRSFD). The Incident Scene Coordinator (ISC) maintained communication with the CR and provided additional information about the incident as available, but did not announce his position. Upon being notified by the CR of the incident, the RPD First Line Manager (FLM) arrived and reported to the ISC. The RPD FLM requested additional RPD assistance from the CR via the ISC. Arriving RPIs performed habitability surveys and found no contamination.

The SOM received notification of the vehicle collision, fire, and medical emergency from the ISC, then briefed and dispatched the First Aid responder. The SOM demonstrated a questioning attitude and received detailed information of the event from the ISC. The SOM used the Public Address (PA) system to issue an announcement directing all personnel to stay clear and upwind of 235-F, and requested for ERO personnel to report to the CR. The SOM then contacted the Emergency Duty Officer (EDO) and briefed her on the incident, the status of the facility, the victims, protective measures that had been taken for F-Area Complex, and requested for SRSFD to respond for medical assistance and fire extinguishment. As ERO members arrived in the CR, they reported to their assigned positions and began performing their respective tasks.

Upon receiving additional information from the ISC regarding the event, the SOM activated the Safety Alarm System (SAS) warble and issued a "Remain Indoors" protective action via the PA system. The SOM reviewed the Emergency Plan Implementing Procedure (EPIP) and, upon receiving concurrence from the Emergency Duty Officer (EDO), classified the event as a Site Area Emergency (SAE-1.3), *Single TRU Waste Container Fire, Unfiltered Release*, in 13 minutes, in accordance with L2-1-EPIP-001, *F-Area Complex Facilities Emergency Classification*. The SOM also assumed the role of Area Emergency Coordinator (AEC), briefed CR personnel of the event classification and his assumption of AEC role, and issued a PA announcement notifying F-Area personnel of the event classification. RPD habitability surveys

were started in the CR to monitor for contamination. Centerra proceeded to control entry into and exit from the facility. All proper notifications to Facility Management and Department of Energy (DOE) were made.

The First Aid responder arrived on scene and allowed other first aid qualified personnel already at the scene to attend to the patients, but remained at a safe distance to avoid spreading contamination; instead, he communicated with the patients and the first aid-qualified RPIs at the scene already attending to the patients. The First Aid responder obtained information from the patients and the RPIs regarding the patients' injuries so that it could be relayed to SRSFD Emergency Medical Services (EMS) personnel upon arrival.

SRSFD (Engine 1 and Medic 3) units were dispatched to 235-F for a two-vehicle accident with two persons injured, and a fire involving a TRU waste drum. Upon arrival, the SRSFD Captain received a detailed turnover from the ISC and RPD FLM, including one patient showing signs of a stroke and being contaminated. The SRSFD Captain then informed SRSOC that he had assumed incident command and proceeded to set up the Incident Command Post (ICP) at an area south of Gate F32. The SRSFD Incident Commander (IC) proceeded to brief SRSFD personnel and dispatched them to the scene to assist with patient care. While getting dressed in their bunker gear, one of the firefighters experienced an air pack malfunction and had to replace it; this delayed the patient contact by the SRSFD. During this time, the wind direction shifted and smoke from the incident scene appeared to be at the rear of the parked SRSFD ambulance with emergency response personnel not relocating the ambulance to a different location.

Once contact with the contaminated stroke patient was made by the SRSFD, approximately 12 minutes after arrival on scene, the patient's contaminated clothes were removed. The stroke patient was then covered in a blanket (simulated), placed on a backboard (simulated), and loaded into the ambulance for transport to the hospital. The second driver, who complained of an ankle injury, was loaded into the same ambulance as the stroke patient. Both patients were transported (simulated) to University Hospital for further medical attention with an RPI aboard the ambulance for continued radiological monitoring. The total time to initiate patient transport was thirty (30) minutes from arrival on scene.

Once the patients were transported, the IC focused the emergency response efforts on mitigating the incident and extinguishing the fire. The IC directed the fire engine Driver/Operator to relocate the truck closer to the scene to conduct fire extinguishment and mitigation. Firefighters proceeded to deploy the fire hose (simulated using rope) and perform fire attack with foam. Upon extinguishing the fire, firefighters proceeded to cover drains with tarps to minimize runoff and performed a 360 degree walkaround to confirm that there was no additional fire and/or issues.

Upon completion of fire attack, SRSFD firefighters then proceeded to the Hot/Warm/Cold Zones to be monitored and perform their dress down process. At the Hot Zone, RPIs had not been provided the necessary air filter cartridges by the SRSFD to perform the regulator swap during firefighter dress down. Upon communicating this information with the IC, he stated that the cartridges were on the fire engine. Once the filter cartridges had been obtained, RPIs completed

the firefighter dress down and detected contamination on the firefighters' bunker gear. Additional contamination was detected around the fire engine near the scene.

ORPS reportable and runoff was addressed by the AEC. The AEC began to consider recovery and reentry, and proceeded to communicate with the IC regarding developing a plan for reentry.

The Technical Support Room (TSR) staff reviewed the declared emergency classification and protective actions and refined the source term, as well as provided support to the AEC regarding mitigation and survey actions through continuous communications. Facility Management and DOE-FR were updated on the event.

The Lead Controller, with concurrence from the Lead Evaluator, terminated field play and downsized the exercise to CR and ICP control cell functions in support of continued exercise play with the TSR staff. Once mitigation actions at the incident scene were completed and the scene was stabilized and secured, the Technical Support Coordinator (TSC) confirmed the TSR went into Recovery Planning and continuous communications to the CR were terminated. The exercise, with the Lead Evaluator's concurrence, was terminated following demonstration of the identified objectives.

Exercise Performance Summary Objectives	Met	Not Met	NE
SAFETY (Critical) Demonstrate Facility and site ERO members perform response activities safely.	X		
PROTECTIVE ACTIONS (Critical) (Deficiency- See Criterion 2.06) Demonstrate the ability to develop and implement appropriate protective actions in accordance with approved procedures.	X		
MITIGATION (Critical) (Deficiency- See Criterion 3.01) Demonstrate the ability to properly mitigate, stabilize conditions and gain control over the emergency situation in accordance with procedures.	X		
RADIOLOGICAL AND CHEMICAL MONITORING (Critical) (Deficiency- See Criterion 4.01 & 4.04) Demonstrate the ability to minimize exposure and control chemical and radiological conditions as appropriate in accordance with primary emergency response priorities.	X		
EMERGENCY EVENT CATEGORIZATION & CLASSIFICATION (Critical) Accurately categorize/classify, upgrade, downgrade and/or terminate the emergency in a timely manner and in accordance with approved procedures.	X		
ERO OPERATIONS Activate and operate emergency response facilities in an effective and timely manner based on the type and extent of emergency in accordance with approved procedures.	X		
MEDICAL (Finding- See Criterion 7.02) Demonstrate the ability to provide appropriate medical care for injured personnel in accordance with approved procedures.		X	
NOTIFICATION (Critical) Perform all onsite and offsite notifications in accordance with approved procedure	X		
OFFSITE INTERACTIONS Effectively interface and coordinate with offsite agencies and organizations in accordance with approved procedures.			X
CONSEQUENCE ASSESSMENT Assess the actual or potential onsite and offsite consequences and develop onsite protective actions and offsite protective action recommendations in accordance with approved procedures.	X		
PUBLIC INFORMATION Develop and disseminate accurate and timely information to the news media and the public in accordance with approved procedures.			X
RECOVERY Perform recovery activities in accordance with approved procedures.	X		

FACILITIES AND EQUIPMENT						
Demonstrate the adequacy and functionality of facilities and equipment to support emergency operations.				X		
EXERCISE CONDUCT						
Demonstrate the ability of the Controller/Evaluator organization to effectively conduct an exercise.				X		
Overall Assessment	Met	X	Not Met		Not Evaluated	

05/03/2018 235-F Evaluated Exercise with TSR Shift: N1

Objective: 1 - - Demonstrate Facility and site ERO members perform response activities safely. (Critical) (Met)

Criterion: 1.01 - Facility and site ERO members perform response activities safely. (Critical) (Met)

- **Observation**

Safety briefings were conducted with Controllers and Players to identify potential hazards at the scene and other locations during the performance of the drill. No unsafe acts were encountered with all personnel participating in the drill in a safe manner and in accordance with established procedures.

- **Opportunities for Improvement**

RPD response golf carts were observed near the scene with broken glass/plastic windows which could cause injuries to personnel.

Facility Personnel responding to the incident exited their vehicles and did not close the doors to the vehicles. Closing the vehicle doors would reduce the possibility of damage or injury.

An SRSFD firefighter not wearing boots was observed walking on rocks. A Controller stopped the firefighter, then recovered his boots.

A tarp used by RPIs to perform Hot/Warm/Cold Zone monitoring had a tear and needed to be taped to remain in proper operating condition.

Objective: 2 - - Demonstrate the ability to develop and implement appropriate protective actions in accordance with approved procedures. (Critical) (Met)

Criterion: 2.01 - Determine/implement protective actions for the facility/area. (Critical) (Met)

- **Observation**

This criterion was demonstrated by the SOM implementing initial protective measures and notifying personnel at or near the incident scene to relocate upwind of the incident. The SOM determined and issued a “Remain Indoors” protective action in 5 minutes, in accordance with L2-1-EPIP-002, *F-Area Complex Emergency Response*.

Criterion: 2.05 – The Site ERO verifies that appropriate protective actions have been taken by the facility and SRSOC and coordinates support as necessary. **(Met)**

- **Observations**

TSR staff reviewed the initiating events and ensured protective actions were appropriate with the declared emergency. TSR personnel also ensured that the current conditions of the incident did not warrant a change in declaration or protective actions.

During recovery planning, the TSR demonstrated good situational awareness by ensuring that the human needs of personnel who were still under protective actions were considered, including how long they had been in Remain Indoors and that their needs were considered.

Criterion: 2.06 - Non-essential personnel perform protective actions as instructed. **(Major) (Not Met)**

- **Opportunity for Improvement**

One individual did not implement protective actions and was observed in the Sample Tunnel transitioning between 772-F and 772-1F, because they believed that the Sample Tunnel represented remain indoors.

- **Deficiency**

One building (221-33F) was observed to have a door open and personnel inside the building performing work during the “Remain Indoors” protective action, which is contrary to the guidance provided in L2-1-EPIP-002, *F-Area Complex Emergency Response*, Attachment 8.2, *AEC/FEC Protective Action Checklist*, as well as SCD-7, *SRS Emergency Plan*, Annex C, *F-Area Annex*. Upon further evaluation after the exercise, it was determined that the PA announcements could not be heard while machinery was operating. Approximately seven personnel were located inside the building.

Suggested Corrective Action

An improved means of communication with the personnel in 221-33F should be implemented to ensure that they are able to hear and acknowledge any PA announcements made by the F-Area CR.

Objective: 3 - - Demonstrate the ability to properly mitigate, stabilize conditions and gain control over the emergency situation in accordance with procedures. (Critical) (Met)

Criterion: 3.01 - The facility ERO mitigates the emergency effectively. (Major) (Met)

- **Observation**

Upon incident initiation, initial responders proceeded to assist the drivers and relocate out of the immediate area. The ISC assumed initial command and control at the scene, checked wind socks for wind direction (no wind), and led personnel to a location uphill of the 235-F perimeter.

- **Deficiency**

Initial responders at the scene utilized the wind sock to determine direction (no wind) and proceeded to evacuate the area to an uphill location. However, the smoke from the fire was moving in the same direction as they evacuated to. This is an indication of a lack of situational awareness.

Suggested Corrective Action

Train personnel to ensure that they remain upwind of the potential plume and not in it.

Criterion: 3.02 - The site ERO mitigates site-level emergency situation(s) effectively and provides adequate support to the facility to assist in mitigating facility-level emergencies. (Major) (Met)

- **Observations**

The TSR staff demonstrated the ability to support the AEC with incident mitigation and scene stability by continuously communicating with the AEC throughout the event.

There was discussion in the TSR about the use of a dump truck filled with sand to help with mitigation and whether it would be useful for incident response. The TSR Coordinator determined that the Fire Department was handling the mitigation process and that the dump truck would be involved in more of a recovery effort versus mitigation.

Criterion: 3.03 - SRSFD personnel mitigate the emergency effectively. (Major) (Met)

- **Observation**

Upon arrival, SRSFD staged uphill (south) of the incident scene. The SRSFD Captain received a detailed turnover from the ISC and RPD FLM, established the ICP, and assumed command. The IC briefed the firefighters who would be performing medical response and dispatched them to the scene to perform patient care. The IC then briefed and dispatched the Entry Team to extinguish the fire and control runoff.

Criterion: 3.05 - Appropriate actions are taken to protect and account for emergency responders at the scene. **(Major) (Met)**

- **Observations**

Responders approaching the incident scene approached from the uphill direction and received briefings from the RPD FLM regarding conditions at the incident scene.

The SRSFD IC verified 100% accountability of emergency responders on scene.

Objective 4: Demonstrate the ability to minimize exposure and control chemical and radiological conditions as appropriate in accordance with primary emergency response priorities. (Met)

Criterion: 4.01 – Monitor and control radiological and chemical conditions and exposures in the incident facility consistent with the emergency response priorities, procedures, and guidelines. **(Critical) (Met)**

- **Observations**

Upon workers relocating to an uphill location, the initial RPI on-scene began monitoring personnel and providing first aid. While monitoring personnel, the initial RPI detected low level contamination on both drivers. The RPI then proceeded to minimize the spread of contamination by removing the drivers' shoes and placing shoe covers on the patients.

The initial RPI on-scene was aware of the change in wind direction and monitored the area but received no increase in airborne contamination and, therefore, chose not to move the injured workers.

Upon arrival at the scene, the RPD FLM requested that the CR dispatch additional RPIs to the scene to provide assistance.

During the setup of the Hot/Warm/Cold zones, RPIs demonstrated good placement of air sampling equipment.

- **Opportunity for Improvement**

RPIs were instructed to delay set up of the Hot/Warm/Cold Zones so that the SRSFD fire engine could be relocated closer to the fire scene for fire attack. RPIs performing monitoring of personnel exiting the incident scene set up a monitoring area without clearly identified boundaries of the Hot/Warm/Cold Zones. Although there wasn't any inadvertent crossing of "Clean/Contaminated" boundaries observed, a better-defined boundary could have been established by RPD.

- **Deficiency**

Contrary to Manual 5Q1.1, *Radiation and Contamination Control Procedures*, Procedure 604, *Personnel Monitoring Requirements*, RPIs at the Cold Zone were observed performing turbo frisking of personnel in that area, and RPIs in the Hot/Warm zones were observed kneeling on the tarp, resulting in their receiving low-level contamination on their knees.

Suggested Corrective Action

Train RPD personnel on the proper techniques of frisking per Manual 5Q.

Criterion: 4.04 – Demonstrate the ability to handle contaminated, non-injured personnel appropriately. **(Major) (Met)**

- **Observation**

Throughout the incident, RPIs performed surveys of the patients and other personnel in and around the scene to determine the possibility of contamination, as well as assisted with decontamination of any contaminated individuals.

- **Deficiency**

An RPI detected contamination at the SRSFD fire engine, but did not replace the survey media (swipe).

Suggested Corrective Action

Train RPD personnel to replace the survey media upon detecting contamination.

Objective 5: Accurately categorize/classify, upgrade, downgrade and/or terminate the emergency in a timely manner and in accordance with approved procedures. (Critical) (Met)

Criterion: 5.01 - Initial event categorization/classification is made appropriately. **(Major) (Met)**

- **Observation**

The SOM, with concurrence of the EDO, classified the 235-F event in 13 minutes of receiving all necessary information using L2-1-EPIP-001, *F-Area Complex Facilities Emergency Classification*. The event was properly classified as a Site Area Emergency, SAE-1.3, *Single TRU Waste Container Fire, Unfiltered Release*.

Criterion: 5.02 – Categorization/Classification is continually reassessed to determine upgrade, downgrade or termination, as appropriate. **(Major) (Met)**

- **Observation**

The TSR staff reviewed the categorization criteria, the EAL, and concurred with the classification of the emergency. Additionally, the Engineering Advisor refined the source term in accordance with Manual 6Q 15.1-750, *Technical Support Staff Operations*.

Objective 6: Activate and operate emergency response facilities in an effective and timely manner based on the type and extent of emergency in accordance with approved procedures. (Met)

Criterion: 6.01 - Activated ERO members must report and perform their assigned duties. (Critical) (Met)

- **Observations**

The SOM/AEC implemented L2-1-EPIP-002, Attachment 8.1, *AEC/FEC Response Actions Checklist* with additional ERO personnel reporting to the CR following notification and assuming their respective duties.

TSR members responded to the TSR upon notification and the EOC was activated within the expected timeframe. Each TSR member accurately completed their required actions and tasks as identified in the position checklists.

Criterion: 6.02 - Demonstrate command and control. (Met)

- **Observations**

The AEC demonstrated command and control in the CR, as well as maintained control of the incident; this includes knowing what actions had been taken and those that still needed to be performed. The AEC dispatched ERO members to the scene and good communication was maintained between the ISC and the CR.

The SOM/AEC continually reviewed his AEC Checklist throughout the incident to ensure that all necessary tasks had been completed. He demonstrated proactive thinking by considering the impact that may occur to an outfall and addressed this concern with on-scene personnel.

- **Opportunity for Improvement**

Upon assuming initial scene command and the role of Incident Scene Coordinator, the ISC did not officially identify himself and his position to initial responders.

Criterion: 6.03 - Demonstrate effective communications. (Met)

- **Observations**

Formal ERO briefings and effective communications were demonstrated in the CR, with the AEC briefing ERO members on pertinent information (i.e. wind direction, pathway to use) and updating personnel as new information was received.

Upon achieving minimum staffing, the TSR Coordinator conducted a briefing to review initiating events and establish immediate priorities.

The ISC and RPD FLM provided a detailed turnover to the SRSFD IC upon arrival and remained with the IC throughout the incident to provide constant communication with the CR.

Good communication between the ICP and the CR was maintained throughout the event. The ISC at the scene continued to update the CR regarding strategies and tactics taken by the SRSFD.

The TSR Communicator made a point to inform the facility to ensure that unbroken contact between the CR and the TSR was maintained, which allowed for continuous communication between the TSR and the facility with no interruptions.

The ISC demonstrated good communication with RPD and the CR, utilizing repeat-backs and providing information to the CR regarding victim and personnel contamination. Additionally, the RPD FLM monitored the information that the ISC was providing to the CR and corrected as needed.

The AEC gave positive feedback to CR personnel and encouraged them regarding their actions throughout the incident.

Criterion: 6.04 - Demonstrate effective use of procedures. (Met)

- **Observations**

Effective use of procedures was demonstrated by ERO personnel through accessing, referencing, and completing the tasks applicable to their respective roles.

The SOM correctly utilized L2-1-EPIP-002, *F-Area Complex Emergency Response*, and L2-1-EPIP-001, *F-Area Complex Facilities Emergency Classification*, upon notification of the incident.

Objective 7: Demonstrate the ability to provide appropriate medical care for injured personnel in accordance with approved procedures. (Not Met)

Criterion: 7.01 - First Aid Teams provide proper first aid care for injured personnel. (Major) (Met)

- **Observation**

Initial responders assisted in relocating the patients to Gate F32 at 701-4F and notified the CR of the incident and the patients' status. Responders then assessed and rendered first aid to the patients and relayed all pertinent information to SRSFD.

Criterion: 7.02 - Emergency Medical Services (EMS) personnel provide proper emergency medical care for injured and/or contaminated/injured personnel. **(Major)**
(Not Met)

- **Observations**

Smoke from the incident scene was observed at the rear of the parked SRSFD ambulance. Personnel did not relocate the ambulance to a different location further from the incident scene.

SRSFD units (single engine unit and an ambulance) arrived on scene at 0817 near the Incident Command Post (ICP) and with open access available to both patients at Gate F32/Bldg. 701-4F. On arrival, the First Aid responder ensured information regarding patient condition and complaint was relayed to SRSFD medical responders (Patient #1: suspected stroke; Patient #2: leg injury). Anticipated scene care by SRSFD medical responders was delayed with the SRSFD arriving at 0817 and medical responders making contact with patient #1 at 0832 (15 minutes) and patient #2 at 0840 (23 minutes). Patients were transported at 0847, after the SRSFD appropriately determined that patient #1 was critical based on displayed signs, symptoms and vital signs provided.

- **Opportunity for Improvement**

Train SRSFD personnel to observe environmental and visual indicators and maintain situational awareness related to smoke in proximity to the ambulance.

- **Finding**

Contrary to SRSFD Standards Policy, *Transport* (P1), which states that the "scene time should be 10 minutes or less for acute Stroke patients and 15 minutes or less (with 12 Lead ECG) for STEMI patients".

Suggested Corrective Action

Upon being advised of the medical condition of a patient, SRSFD should don necessary gear and take appropriate actions to provide care for the patient per 2Q2-1.10, *Emergency Medical Services*, Procedure 1003, *Care of Contaminated Patients*. In the case of the 235-F Exercise, SRSFD personnel should have donned their SCBAs, rapidly packaged and transported the patient to the appropriate medical facility with an RPI assisting with monitoring en route.

Criterion: 7.05 - RPD personnel survey patients and provide PPE and decontamination advice to medical professionals. (Major) (Met)

- **Observation**

RPD personnel assisting and monitoring the patients at Gate F32 relayed information to the ISC and SRSFD personnel regarding patient status and contamination. Additionally, an RPD representative accompanied the injured patients during simulated transport to an off-site medical facility.

Objective 8: Perform all onsite and offsite notifications in accordance with approved procedures. (Critical) (Met)

Criterion: 8.01 - Perform onsite notifications. (Critical) (Met)

- **Observation**

This criterion was demonstrated by the SOM/AEC completing emergency notifications in accordance with L2-1-EPIP-002, *F-Area Complex Emergency Response*. The SOM/AEC directed a PA announcement notifying F-Area Complex personnel of the protective actions. The SOM/AEC also notified facility management, DOE facility representatives, and the Savannah River Site Operations Center (SRSOC). Additionally, completed EDO information forms were faxed to the Savannah River Site Operations Center (SRSOC), and the SOM/AEC additionally verified the need for Occurrence Reporting and Processing System (ORPS) reportable of the incident.

Objective 9: Offsite Interactions (N/A)

Offsite interactions are evaluated during site-level exercises only.

Objective 10: Assess the actual or potential onsite and offsite consequences and develop onsite protective actions and offsite protective action recommendations in accordance with approved procedures.

Criterion: 10.01 - Accurately assess actual or potential on- and off-site consequences. (Major) (Met)

- **Observation**

This criterion was demonstrated by the TSR Staff reviewing and concurring with the EAL referenced for initial classification, and by the Engineering Advisor developing a refined source term.

Objective 11: Public Information (N/A)

Public information is evaluated during site-level exercises only.

Objective 12: Perform recovery activities in accordance with approved procedures. (Met)

Criterion: 12.01 - Develop a recovery plan outline that identifies appropriate recovery strategies. **(Critical) (Met)**

- **Observation**

This criterion was demonstrated by the TSR Coordinator reviewing the stability criteria within 6Q15.1, *Emergency Response Facility (ERF) Procedures*, Procedure 113, *Termination and Recovery Planning*, and then providing a briefing to the Emergency Director when it was complete.

Objective 13: Demonstrate the adequacy and functionality of facilities and equipment to support emergency operations. (Met)

Criterion: 13.01 - Facilities and equipment are adequate, functional, and safe to operate. **(Critical) (Met)**

- **Observations**

Facility equipment was used appropriately and safely and performed adequately during the drill; these include phones, radios, the SST, status boards, and vehicles.

The CR Status Board Keeper did not have sufficient room along the wall of the CR to place completed status sheets. This resulted in status sheets being stacked on each other to make space.

- **Opportunity for Improvement**

An SRSFD firefighter experienced an operational malfunction with his self-contained breathing apparatus (SCBA) and had to exchange the SCBA for a properly-functioning one, which caused a delay in response and the ability to make patient contact.

Objective 14: Demonstrate the ability of the Controller/Evaluator organization to effectively conduct an exercise. (Met)

Criterion: 14.01 - Develop a scenario that is based on hazards assessment documents, that is realistic, and minimizes the use of generic, non-specific simulations. **(Major) (Met)**

- **Observation**

The EP Exercise scenario was developed to provide an adequate and realistic emergency event in accordance with the recent 235-F Complex Emergency Preparedness Hazard Analysis (EPHA). The scenario set measurable objectives and were based on events as identified in *the Emergency Planning Hazards Assessment for 235-F* (S-EHA-F-00004, Rev. 7). Additionally, simulated actions and conditions were minimized where possible to allow for realistic free-play.

Criterion: 14.02 - Effectively control an exercise in a manner that maximizes free-play by participants and ensures that sufficient opportunity is provided for all objectives to be met. **(Major) (Met)**

- **Observation**

An adequate number of properly training, adequately briefed, and knowledgeable Controllers were appropriately positioned to control and assess drill performance and accomplishment of all objectives with minimal disruption to participant response. Controllers were briefed on the scenario, with key Controllers receiving a walk-down of the scenario. Additionally, formal Controller and Observer protocol and communications were demonstrated.

- **Opportunities for Improvement**

RPis at the Hot Zone did not have the necessary air filter cartridges provided to them by the SRSFD to perform the regulator swap during firefighter dress down. When questioned about the cartridges, the IC stated that they should be in the fire engine.

Contrary to the information found in Section 7.2, *Radiological and/or Chemical Data*, of the scenario, the RPD Controller in the field did not provide airborne contamination data to the initial responders. Upon follow up interview, the RPD controller in his professional opinion, stated that he believed that the responders evacuated the scene quickly enough to avoid receiving any contamination.

Criterion: 14.03 - Conduct the exercise safely. **(Major) (Met)**

- **Observations**

Appropriate safety equipment was utilized during the exercise with all safety postings followed. Controllers and Observers were briefed on safe conduct of the exercise, how to act safely before and during the exercise, and what safety

conditions and actions to look for during the response. Drill briefings included details on safety measures, responsibilities, and precautions. The Players and Controllers followed approved facility and site safety policies while conducting drill activities.

Drill props were positioned to ensure a realistic drill environment for Players.

The fuel truck at the incident scene did not have all the placards necessary that first responders would normally use to identify hazardous materials (i.e. placards on all four sides of the vehicles displaying the product it contained).

- **Opportunity for Improvement**
Properly label props prior to the exercise.

Criterion: 14.04 - Effectively evaluate the emergency management program and conduct meaningful critiques. **(Major) (Met)**

- **Observation**
Player and Controller/Observer/Evaluator debriefings were held to discuss the content of the exercise and player performance. Participants identified strengths and weaknesses noted during exercise play, and provided recommendations based on those results.

Lessons Learned

Incident Scene

- While setting up the scene, the training drum was not ready for the Exercise and did not have markings on it identifying it as a training drum. The 235-F RPD FLM confirmed that the drum was intended for training. Additionally, the lid on the training drum was still secured by the drum closure ring and facility personnel removed the ring with improper tools.

Recommendation: Training aids should be labeled properly to reduce any risk of a contaminated drum or container being used, and proper tools should be used to minimize any safety issues.

ISC

- The ISC assumed the role and responsibilities of the position, but did not announce to the initial responders that he was assuming that role.

Recommendation: Upon assuming a role, personnel should announce their position to reduce confusion.

RPD

- RPIs at the Hot/Warm/Cold Zones had been instructed to delay setting up in order for the SRSFD fire engine to be able to enter the scene and, instead, had a boundary set up to differentiate “Clean” from “Contaminated” personnel. The “Clean/Contaminated” boundary that was initially set up was not well-identified.

Recommendation: Markings or other identifiers should be used to differentiate the “Clean/Contaminated” areas when a decontamination zone is not able to be set up.

SRSFD

- Wind direction had changed and the smoke from the incident scene was observed at the rear of the ambulance, but personnel did not move the vehicle.

Recommendation: All personnel at the scene should use situational awareness to ensure that the contamination is not spreading to the location of emergency response personnel and vehicles.

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