



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

DEC 19 2019

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) 2019

This letter transmits the Annual Report committed in Section 6 of the Department's IP, and the After Action Report, F-Area Emergency Preparedness Exercise committed to in Action 3-4.

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 black ink, appearing to read "Michael D. Budney".

Michael D. Budney
Savannah River Site Manager

NMPD-20-0008

2 Enclosures:

1. FY 2019 Annual Report for the United States Department of Energy IP for DNFSB Recommendation 2012-1
2. 2019 Building 235-F Exercise After Action Report

Honorable Hamilton

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DEC 19 2019

cc w/encls:

William White, EM-1

Todd Shrader, EM-2

Joceline Nahigian, EM-2.1 DCOS

Jeffery Griffin, EM-3

Joe Olencz, AU-1.1

Dae Chung, EM-3.1

Greg Sosson, EM-3.1

**Fiscal Year 2019
Annual Report
for the
United States Department of Energy
Implementation Plan
for
Defense Nuclear Facilities Safety Board
Recommendation 2012-1
Revision 0**



Savannah River Site Building 235-F Safety

Washington, DC 20585

December 2019

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EXECUTIVE SUMMARY

This Annual Report fulfills the requirement of Section 6.0 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 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.”

Submission of this Annual Report also addresses the following specific IP Actions:

- Action 1-14 Complete the deactivation of Cells one through nine. This will include waste removal.
- 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.

Attachment 1 contains a table that lists specific IP Actions and completion status. Attachment 2 contains the approved F-Area Drill schedule (plan).

FISCAL YEAR (FY) 2019 PROGRESS

DOE committed to remove and/or immobilize as much Material At Risk (MAR) as practical to demonstrate public protection (<25 Rem) and collocated/facility worker protection (< 100 Rem at 100 m). MAR removal commenced in October 2018. The focus was on MAR removal from Plutonium Fuel Form (PuFF) Cell 1, Cell 2, and the Cell 1 Maintenance Wing Cabinet. These areas were selected because they contained about 60% of the MAR in the building. The removal activities included sweeping, vacuuming, and scrubbing with abrasive pads. Waste was bagged out and assayed to determine the amount of MAR removed. MAR removal activities were completed in these areas in the spring of 2019. Measurements of the waste bagged out of these areas were lower than expected and revealed that cleanout activities had succeeded in only removing approximately 64% of the MAR in those areas. As a result of the above activities, DOE recognized that this material was not as readily removable, or dispersible as expected during development of the original IP. Planned cleanout activities were determined to be impractical in

reducing residual Plutonium-238 levels enough to ensure the collocated worker dose from a facility fire would be less than 100 Rem at 100 meters:

With removal activities unlikely to achieve the desired IP end state, DOE-Savannah River Operations Office (SR) concluded that continuing to place workers at risk by removing additional MAR is not appropriate. DOE-SR paused MAR removal activities to avoid the additional potential dose to workers and risk of puncture wounds. Since July 2019, DOE-SR has been pursuing a new strategy that is focused on elimination of fire risk and mitigation of seismic consequences. This effort will be supported and informed by our activities to revise the Consolidated Hazard Analysis, perform accident analysis calculations for the release of radiological material due to seismic and non-seismic events, characterize the remaining MAR, and revise the Safety Basis (SB). Together these activities support DOE's continuing commitment to ensure the adequate protection of workers and public health and safety from the residual contamination hazards within Building 235-F.

Savannah River Nuclear Solutions engaged the services of an independent fire protection engineering service, which provided a subject matter expert with extensive experience throughout private industry, commercial nuclear power, and the DOE Complex. An evaluation of the fire risk inherent in the 235-F facility was conducted by this Subject Matter Expert. The fire protection SME identified some possible combustible materials that should be evaluated or removed. His evaluation concluded once these additional combustible sources were addressed that it was not credible for a fire to initiate (including following a seismic event), and then propagate such that it could involve the MAR. The combustibles of concern include installed ceiling tiles, and possible oil/fluid in a welding machine. Modifications to address these additional combustibles are in progress, and revised SB documents are being developed. Preliminary analyses indicate that the revised SB is expected to demonstrate there are no credible release mechanisms which could result in a collocated worker receiving 100 Rem at 100 meters.

PLANNED PROGRESS FOR FY 2020

Funding has been allocated to the 235-F project for FY 2020. The key specific activities that will be undertaken in FY 2020, based on current funding are listed below:

1. Complete characterization of MAR remaining in Building 235-F
2. Conduct a DOE peer review of contractor analysis of Building 235-F fire hazards.
3. Revise Consolidated Hazard Analysis to eliminate fires as a credible event which can affect MAR.
4. Revise accident analysis calculation for release of radiological material due to seismic and non seismic events.
5. Revise the facility SB.

ANNUAL UPDATE ON DRILL PERFORMANCE

Action 3-4, Drill Conduct and Evaluation

On May 16, 2019, the SRS conducted the FY 2019 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), F-Tank Farm, Mixed Oxide Fuel Fabrication Facility, Waste Solidification Building, and SRS Protective Force (Centerra).

The drill scenario was based on an earthquake occurring during normal MAR removal activities in 235-F. The earthquake causes a power outage in 235-F, a fire in 292-2F, and breaches in the exhaust plenum on the exterior of the building. One person is injured while exiting the facility. 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 indicated 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. The response was evaluated against 82 exercise objectives. Seventy-two objectives were met, five objectives were not met, one objective was not observed, and four objectives were not applicable to the scenario. The five findings from the objectives that were not met are being addressed. They are:

- Only one Alpha field instrument was noted to have audible response. Per Procedure 5Q1.2 133A 2.5 *Contamination Surveys*, during emergency situations audible reports should be on.
- Frisking through the decontamination line was not in accordance with manual 5Q, Chapter 3, Appendix 3D General Requirement 3 "Move probe slowly over surface, approximately two inches per second."
- Simulations were made that were outside of the pre-identified simulations in the exercise plan and without the knowledge/approval of the exercise lead controller.
- The person familiar with the scenario assumed a player role due to a last-minute change. That individual assumed a player role in the Technical Support Room (TSR). While this did not negatively impact the overall conduct and performance of the TSR during the exercise, having prior knowledge of the scenario details could have potentially altered the TSR's response and interaction with the facility during the exercise.
- Public Address announcements regarding protective actions provided clear instructions to personnel to refrain from eating or drinking until habitability surveys had been completed. Numerous personnel within 704-74F were noted to have either not understood or ignored this instruction and continued to eat and/or drink prior to the completion of habitability surveys.

ATTACHMENT 1
Recommendation 2012-1 IP Actions

Action Number	Action Description	Due Date	Completion Date
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 Basis for Interim Operation (BIO) (which supersedes the Surveillance & Maintenance (S&M) BIO) to include deactivation activities in PuFF Cells 6-9.	07/30/13	10/31/13
1-3	Restore cell infrastructure in PuFF Cells 6-9.	07/30/15	01/28/16
1-4	Complete a Readiness Assessment (RA) for initiation of deactivation activities in PuFF Cells 6-9 and implement the deactivation BIO.	05/31/16	07/10/15
1-5	Update planning schedule to reflect PuFF Cells 1-5 deactivation actions for the upcoming 12 months.	12/31/13	12/09/13
1-6	Update planning schedule to reflect PuFF Cells 1-5 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 1-5.	04/30/18	11/03/17
1-8	If needed complete a RA for initiation of deactivation activities in PuFF Cells 1-5 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 1-5.	01/31/19	08/08/18
1-10	Update planning schedule to reflect PuFF Cells 1-5 deactivation actions for the upcoming 12 months.	01/29/16	12/22/15
1-11	Restore cell infrastructure in PuFF Cells 1-5.	11/30/18	08/10/18
1-12	Update planning schedule to reflect PuFF Cells 1-5 deactivation actions for the upcoming 12 months.	01/31/17	12/31/16

Action Number	Action Description	Due Date	Completion Date
1-13	Update planning schedule to reflect PuFF Cells 1-5 deactivation actions for the upcoming 12 months.	01/31/18	12/31/17
1-14	Complete the deactivation of Cells 1-9. This will include waste removal.	1/31/20	07/10/19
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 Building 235-F deactivation BIO once the MAR is removed, and acknowledge the facility meets the requirements of 10 CFR 830 to protect the maximally exposed off-site individual to within the establish DOE-STD-3009 evaluation guidelines and protect the co-located and facility worker within the accepted SRS guidelines of 100 Rem.	05/31/21	
2a-1	Development of Building 235-F specific Transient Combustible Control Program.	01/15/13	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.	03/04/13	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. (Action 2c-1 was completed prior to issuance of the IP, Revision 0)	N/A	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.	04/01/13	03/04/13


Action Number	Action Description	Due Date	Completion Date
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 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
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. Continue to include in F-Area drill plan until the hazard is removed or mitigated.	12/31/14 & Annually	12/09/19
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.	12/31/14 & Annually	05/16/19

ATTACHMENT 2
F-Area Drill Schedule

2020 F-AREA COMPLEX EP DRILL SCHEDULE

Emergency Preparedness Coordinator: Monica Williams
Facility Point of Contact: Alan Mulligan

Date	April 1, 2020
Type	F-Area Radiological Release with Protective Actions (Evaluated) (Plutonium Processing Mission and SRR will be invited to participate)

Approval: Alan Mulligan  12/9/2019
F-Area Operations Manager Signature Date

July 11, 2019

SRNS-J4000-2019-00099

Tracking #: 10667

Mr. Ronald T. Bartholomew, Director
Office of Safeguards, Security, and Emergency Services
Savannah River Operations Office
U. S. Department of Energy
P. O. Box A
Aiken SC 29802

Dear Mr. Bartholomew:

SUBMITTAL OF THE 2019 F-AREA EMERGENCY PREPAREDNESS EVALUATED EXERCISE AFTER ACTION REPORT

This letter formally transmits the 2019 F-Area Emergency Preparedness (EP) Evaluated Exercise After Action Report (AAR), SRNS-J5480-2019-0023 for submittal per DOE O 151.1D (Attachment 3, 14a.(2)(f), "Comprehensive Emergency Management System". The Corrective Action Plan will be developed within 45 calendar days upon submission of this letter per DOE Order 151.1D (Attachment 3, 14b.(1)(c).

If you have any questions concerning this request, please contact Thomas J. Diaz at ext. 5-7817.

Sincerely,



Lee M. Schifer, Director
ESH&Q/Safeguards, Security & Emergency Services

Document Transmitted Contains OOU Information
When separated from enclosures, this transmittal
document does not contain OOU.

tjd/gsl

Att.

c: E. A. Szymanski, DOE-SR, 730-2B
A. S. Morton, 730-B
D. M. Delmore, 730-2B
H. Burgess, 730-2B
W. C. Swygert, 730-2B
M. T. Sautman, DNFSB, 703-41A
Z. C. McCabe, 703-41A
S. A. MacVean, SRNS, 730-IB
D. J. Carr, 730-IB
M. C. Gauthier-Love, 730-IB
S. A. Perella, 730-IB
R. M. Sprague, 730-IB
D. G. Murdoch, 707-1 2B
K. W. Whitt, 766-H
B. W. Lockhart, 703-A
R. G. Still, 704-3N
J. G. Hightower, 703-45A
N. M. Aguilar, 703-45A
B. L. Mitchem, 773-43A

C. O. Rowell, 773-45A
M. S. Kramer, 703-45A
T. J. Diaz, 703-45A
J. L. Mooneyhan, 704-59E
G. A. Mulligan, 772-F
Records Management, 773-5 2A
DOE ECA TS (File Copy) 730-B

Enclosure:

[2019 F-Area Emergency Preparedness Evaluated Exercise after Action Report](#)