



Department of Energy  
Savannah River Operations Office  
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DNF SAFETY BOARD  
DEC 23 2012

The Honorable Peter S. Winokur  
Chairman  
Defense Nuclear Facilities Safety Board  
625 Indiana Avenue, NW, Suite 700  
Washington, DC 20004

Dear Mr. Chairman:

SUBJECT: Transmittal of Defense Nuclear Facilities Safety Board (DNFSB) Recommendation 2012-1 Implementation Plan (IP) Deliverables 1-5, 3-3 and 3-4

This letter transmits the following deliverables consistent with Commitments 1 and 3 of the Department of Energy's IP for DNFSB 2012-1, Savannah River Site Building 235-F Safety. The deliverables included in the enclosed Annual Report includes the following:

Deliverable 1-5: Update planning schedule to reflect Plutonium Fuel Form cells 1 through 5 deactivation actions for the upcoming 12 months.


Deliverable 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.

Deliverable 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.

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 Patrick McGuire, Assistant Manager for the Nuclear Materials Stabilization Project at (803) 208-3927.

Sincerely,

  
fw David C. Moody  
Manager

NMPD-14-0008

Honorable Winokur

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DEC 23 2013

Enclosure:

Fiscal Year 2013 Annual Report  
for the United States Department  
of Energy IP for DNFSB  
Recommendation 2012-1  
Revision 1, 12/31/13

cc w/encl:

David Huizenga, EM-1  
Matthew Moury, EM-40  
Todd Lapointe, EM-41  
Mari-Josette Campagnone, HS-1.1

Enclosure: Letter, SUBJECT: Transmittal of Defense  
Nuclear Facilities Safety Board Recommendation 2012-1  
Implementation Plan Deliverables 1-5, 3-3 and 3-4,  
dated DEC 23 2013

**Fiscal Year 2013  
Annual Report  
for the  
United States Department of Energy  
Implementation Plan  
for  
Defense Nuclear Facilities Safety Board  
Recommendation 2012-1  
Revision 2**

*Savannah River Site Building 235-F Safety*



**Washington, DC 20585**

**December 23, 2013**

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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 1-5: Update planning schedule to reflect Plutonium Fuel Form (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.

In Fiscal Year (FY) 2013, Department of Energy Savannah River (DOE-SR) made a strong start on the 235-F Risk Reduction Project. Up to the point at which budget restrictions and sequestration in the second and third fiscal quarters of FY 2013 began to affect the Project's ability to maintain schedule, all IP Actions were completed as scheduled, including the Deactivation Project Plan. Progress continued at a reduced level in response to reduced funding, and increased again in the fourth fiscal quarter when reprogramming funds became available. A revised FY 2014 plan and schedule was developed and readied for implementation that included plans for the FY 2013 actions that could not be completed in FY 2013.

The Department of Energy entered FY 2014 under a Continuing Resolution (CR), which has again restricted the funding available for DOE-SR projects, including 235-F Risk Reduction. Despite this, DOE-SR, in its balancing of risks and priorities, has continued to allocate funds for the Project. Funding has been provided for continuing technical and planning work to support the beginning of Material at Risk (MAR) removal, for implementing the Deactivation Basis for Interim Operation (BIO) on a limited basis, and for accomplishing tangible field work in FY 2014. The Department anticipates funding for the remainder of FY 2014 and FY 2015 will become clear early in calendar year 2014. DOE-SR will re-evaluate planned activities for 235-F risk reduction for the remainder of FY 2014 and out-years and will work with DOE-Head

Quarters elements to provide written notification to the Board on the status of any Implementation Plan commitments that will not be completed by the planned date.

Attachment 1 contains a table that lists specific IP Actions completed in FY 2013 including actions completed as of the issuance date of this report. Attachment 2 contains a schedule summarizing planned actions/activities for the upcoming 12 months (Action 1-5).

## **FISCAL YEAR 2013 PROGRESS**

In FY 2013, DOE-SR developed the DOE IP for DNFSB Recommendation 2012-1, *SRS Building 235-F Safety*, which was transmitted by the Secretary of Energy on December 5, 2012.

Also during FY 2013, DOE-SR completed ten of the eleven IP actions due in FY 2013 in accordance with the original IP schedules. One IP Action (1-2, under which the Deactivation BIO for 235-F will be issued) was deferred until December 31, 2013 and will be completed on that schedule.

DOE-SR also made significant progress on preparing for the initiation of deactivation activities. The key accomplishments in FY 2013 are as follows.

1. Formation of a core project management team with a Project Manager specifically chosen based on his experience with high-impact projects at SRS and the Rocky Flats Environmental Technology Site; an Engineering Manager who is the site Subject Matter Expert (SME) on Deactivation and Decommissioning (D&D), and has extensive experience planning and executing deactivation projects; a Field Operations Manager who was the primary on-scene manager for the Transuranic (TRU) re-pack activities carried out under American Recovery & Reinvestment Act (ARRA), and who had a leadership role in ensuring lessons learned from the puncture wound incident were institutionalized and implemented in the field; and other core team members who collectively have considerable depth in key specialty areas such as rigging, glovebox work, Pu-238, deactivation, and Building 235-F.
2. Development and implementation of a project planning and execution process that utilizes a level of rigor that is usually found only on larger capital projects. This includes formal risk analyses, a multi-level Work Breakdown Structure, a multi-year resource-loaded implementation schedule, a resource-loaded execution schedule, and the use of formal Earned Value methods to help monitor project status.
3. Fabrication and installation of a PuFF Cell mock-up facility (based on PuFF Cell 2) that will be used for a variety of tasks, mostly in the pre-MAR-removal phase of the project. These include process and procedure development and validation, process training, operator qualification, work planning, and preparation for key field evolutions such as manipulator replacement.

4. Completion of a detailed Project Deactivation Plan covering the full life-cycle of the project. This Plan serves as the conceptual and planning guide for all subsequent risk-reducing work on this project.
5. Development and implementation of a Surveillance and Maintenance BIO, implementation of a transient combustible control program, evaluation of the fixed combustible load in the building, and development of a specific plan for fixed combustible removal, encapsulation, or isolation. The technical work on the design document to support fixed combustible removal was complete at the end of FY 2013.
6. Extensive walk-downs and reviews of drawings and documents to determine the plan for de-energization of unnecessary electrical circuits in the building. Development of a specific plan for de-energization. The design document needed to support implementation of the de-energization plan was at the 95% completion level at the end of FY 2013.
7. Engineering evaluation of the existing Fire Detection and Alarm System (FDAS) and the specification of upgrades needed. The technical work on the design document to support the FDAS upgrade was complete at the end of FY 2013.
8. Planning and conduct of Emergency Preparedness (EP) drills in F Area, centered around a radiological release from 235-F. Review and upgrade of protective action plans, procedures, and routines.

DOE-SR has made a strong start on this project and has the team and infrastructure in place to continue making progress.

#### **PLANNED PROGRESS FOR FISCAL YEAR 2014**

Despite funding limitations imposed by the FY 2014 CR, funds have been allocated to the 235-F project. If more funds become available as the year progresses, or if institutional priorities change, the DOE-SR team has plans in place to complete additional project work. The key specific activities that will be undertaken in FY 2014, based on current funding, are listed below.

1. Crew Retention and Training.  
Crew members with extensive hands-on experience working with Pu-238, including during the ARRA Legacy TRU campaign, have been assigned to this project. This includes operators, riggers, radiological control technicians and supervisors, foremen, and managers. Funding in 2014 keeps this crew together and prepares them to move into the MAR removal phase of the project. Qualifications have been established for crew members and training plans are in place. Classroom training has commenced, as has hands-on training in the mock-up facility.
2. Use of the mock-up facility.  
The mock-up facility will be used for process development, process validation, procedure development and validation, training development, and training conduct and evaluation.



The mock-up will be used to experiment with tools, develop requirements for tools to be developed, and field-test prototypes. These activities will be done primarily by the crew members who will be using the tools. Maximum benefit will be sought from methods and tools applied during the TRU re-pack campaign. The mock-up will be used to prepare for everything from relatively routine activities such as glove change-out to the replacement of manipulators. Drill training for possible off-normal events and emergencies will be conducted using the mock-up. As training progresses, mock-up activities will be performed using all the rigor expected on the job, including tools such as supplied-air suits and full radiological controls, to ensure the crew is prepared to work safely.

3. **Technical Document Preparation and Planning.**  
Technical documents (plans, designs, and various other forms of technical documents) will be developed in FY 2014. These support a wide range of activities needed to proceed with MAR removal. They include, but are not limited to, development of the cell-by-cell decontamination approach; development of a cell-by-cell material removal plan; completing smoke testing, glove installation, and temporary lighting; completing the design for breathing air distribution; preparing scoping documents for tooling, support tool evaluation in the mock-up; and preparing electrical and mechanical isolation indexes for cells 6-9.
4. **Deactivation BIO Implementation progress.**  
In FY 2014, DOE-SR will execute a Safety Basis Implementation Plan to implement the portions of the Deactivation BIO that can be implemented without allowing the project to proceed into the MAR removal phase. This will institutionalize improved controls over transient combustibles, achieve Safety System status for two key building systems (nitrogen back-up and emergency diesel), and provide other benefits such as shortening the “ramp-up” cycle to MAR removal and associated project activities. The work the Contractor is allowed to actually perform in the field will be clearly described in, and controlled through, the Authorization Agreement (AA).
5. **FDAS installation, testing, and acceptance.**  
This will be completed in FY 2014.
6. **Readiness to complete additional scope.**  
Provisions are in place to quickly apply additional funds that come available in FY 2014 to the project in short order. The scopes of work most ready to work, and that provide the most risk-reduction payoff, are the Fixed Combustible Removal and Electrical De-energization scopes.

## **UPDATED F AREA DRILL PLAN**

The updated F Area Drill Schedule for 2014 is shown in Attachment **3**. It is provided in the same format as the original deliverable provided to the Board for IP Action 3-3 in April 2013. It constitutes the annual updated drill plan to be provided in December each calendar year until the hazard is removed or mitigated, as required by the IP.

Building 235-F will be the host facility for the 2014 Site Evaluated Exercise, scheduled for May 14, 2014. The scope of play will include all F-Area Complex personnel, the SRS Fire Department, Wackenhut Services, Inc. – Savannah River Site (WSI-SRS), and the full site-level Emergency Response Organization (ERO). All other F-Area tenants (Mixed Oxide Facility (MOX), Waste Solidification Building (WSB), Savannah River Remediation (SRR), DOE-SR, National Nuclear Security Administration – Savannah River Field Office (NNSA-SRFO), and NA-262 SRS) will participate. An After-Action Report will be prepared after the Exercise.

MOX and WSB plans to conduct their normal severe weather drill, which involves all of their workers, in the April 2014 time frame and will document the results of this drill. The day of the site exercise, designated players (selected foremen) will participate by responding to normal communication announcements. These selected players will be expected to respond per their procedures.

## **ANNUAL UPDATE ON EP DRILL PERFORMANCE**

In addition to the submission of the 2013 235-F EP Drill Schedule, two important EP-related actions were completed in FY 2013:

1. Action 3-2, an assessment of the plans and procedures related to determination and implementation of protective actions following a radiological release from Building 235-F.
2. Action 3-4, the conduct of one formally assessed drill based on a radiological release from Building 235-F. This included evaluation of performance, and the development and submission of a formal after-action report.

Updates on each of these items are provided below.

### **Action 3-2, Protective Action Review**

An assessment of the existing protective action plans and procedures was conducted to ensure that the plans and procedures establish an effective process for determining and implementing protective actions and that, once implemented, the protective actions provide the best possible level of protection for F-Area personnel.

The results of the assessment indicate that the plans and procedures generally establish an effective protective action strategy, with some improvement opportunities noted, specifically in the selection of buildings that are suitable for use during a Remain Indoors protective action.

To address the improvement opportunity, the definition of “Remain Indoors” was revised to exclude those buildings that do not provide adequate protection against air infiltration. Emergency plans and procedures at both the site-level and facility-level have been reviewed to identify needed changes. Most procedures have been revised to incorporate

the revised definition. Some procedure changes are still in progress and are being tracked as commitment action items in the Site corrective action system until completion.

Within F-Area, a multi-disciplinary team walked down all F-Area Complex buildings to determine which structures provide the most protection during a “Remain Indoors” protective action and to verify that ventilation shutdown instructions were posted in buildings most suited for use during protective actions. Based on the results of the team’s evaluation, documented in a separate report, the structures that were not suitable for “Remain Indoors” were labeled by exterior postings.

Employees were educated on the change through Site Employee Communications, informational briefings, a revision to the F-Area Facility Entry Training module, and an F-Area Protective Actions Response pamphlet to serve as a quick reference guide.

The revised definition has also been institutionalized in General Employee Training (GET) and Consolidated Annual Training (CAT) to formally educate all site employees and visitors on the revised definition.

### **Action 3-4, Drill Conduct and Evaluation**

Drills involving an external event impacting Building 235-F, resulting in an unfiltered radioactive release, were conducted on May 15, 2013 and July 17, 2013. An additional drill was conducted on August 7, 2013 to validate the effectiveness of corrective actions taken following the first two drills.

The overall performance of these drills indicated the facility’s ERO is capable of responding effectively to a radiological release from Building 235-F and implementing protective actions to protect personnel in adjacent facilities and construction sites. However, several improvement opportunities were identified in the areas of:

- Radiological control practices
- Emergency Categorization and Classification
- Implementation of protective actions
- Drill conduct and control

### **Radiological Control**

**Radiological Protection Department’s (RPD) firefighter dress-down line was set up too far away from the Hot Zone, so that potentially contaminated firefighters had to walk farther to get out of bunker gear.**

Lesson Learned: When potentially contaminated firefighters are exiting the Hot Zone, they will be physically exhausted and their air supply is likely to be low. The dress-down line should be set up to minimize the distance the firefighters must walk to ensure they are taken off air and out of their bunker gear as quickly as possible.

**When RPD first identified contamination, the location was not marked in any way.**

Lesson Learned: The location where contamination is found should be marked to provide a visual indicator to all responders. This will minimize the potential for contamination to be spread unnecessarily.

**Few contamination data / field readings were received in the Control Room.**

Lesson Learned: Field measurements provide the best indication of the extent of the release and must be relayed to the Control Room to ensure that decisions are made using the best available information. The Incident Scene Coordinator (ISC) and RPD Coordinator should ensure that all known information is relayed to the Control Room promptly, including negative indications such as “No Detectable”.

All of the above lessons learned were distributed to appropriate personnel through a required reading.

These lessons learned will be incorporated into the annual SRS Fire Department Live Burn training. Facility Radiological Protection personnel support this training, providing an opportunity to share the lessons learned and demonstrate effective radiological control practices.

**Classification**

**Though the event was correctly classified as a Site Area Emergency, the 16 minutes between event recognition/identification/discovery and event classification exceeded the 15-minute time limit specified in DOE O 151.1c. Classification was successfully demonstrated during the August 7 drill.**

Corrective Action: The information below was briefed to F-Area Complex personnel with responsibility for emergency categorization and classification. An event must be categorized as an Operational Emergency as promptly as possible but no later than 15 minutes after event recognition/identification/discovery. The F-Area Complex Shift Operations Manager (SOM) has emergency classification authority for F-Area Complex facilities. Classification is made by comparing the incident information with the Emergency Plan Implementing Procedure, L2-1-EPIP-001, *F-Area Complex Facilities Emergency Classification*, and matching incident conditions with a specific emergency category. The SOM is required to contact the Emergency Duty Officer (EDO) using the Selective Signaling Terminal (SST) phone prior to making an emergency declaration and walk through the classification process in collaboration with the EDO. The 15 minute time period begins when event information and/or conditions are made available to the personnel in the facility.

Additionally, this information was provided to all site Area/Facility Emergency Coordinators (AECs/FECs) via Required Reading. Effectiveness of this corrective action will be verified through the conduct of drills. If the issue recurs, additional corrective actions will be identified and implemented.

### **Public Address (PA) Announcements**

**The F-Tank Farm Facility Emergency Coordinator did not ensure the Safety Alarm System (SAS) / warble for F-Tank Farm was sounded to gain attention of workers prior to making the PA announcement of Remain Indoors for Protective Actions. However, the FEC followed up by making radio and telephone announcements.**

Corrective Action: All SRR personnel responsible for directing implementation of protective actions have been briefed on the Protective Action process and the need to follow established procedures.

To improve the effectiveness of protective action implementation in F-Area, the Public Address system in F-Area is being modified to ensure that F-Tank Farm personnel receive protective action instructions from the F-Area AEC.

### **Controllers**

**Communication between Controllers was less than adequate, contributing to Player performance issues. Examples include:**

- Controllers did not clearly communicate the contamination readings that had been given prior to the arrival of RPD. Because of this, the line between the Hot and Warm zones was moved, causing one of the firefighters to walk past other personnel that were in lower levels of Personal Protective Equipment (PPE).
- Because RPD had to move, one RPD Controller was not aware of the contamination readings to be given at the Command Post, resulting in some confusion among Players. Because the MOX Services (gravel) road could not be closed, the Command Post was set up closer than it should have been which was inside the areas on the contamination map from the scenario. The decision was made NOT to give contamination data at this location, since the actual location was for drill purposes only. This decision was not properly communicated to Scene, RPD, and Command Post controllers.
- When three of the four firefighters on the Entry Team were taken out of their bunker gear for safety (heat stress) concerns, some Players were confused and did not understand that the firefighters would have still been in bunker gear and in play. Instead, the Players believed the firefighters had been surveyed clean, resulting in the firefighters getting less stringent surveys than appropriate. Controllers at the scene did not clearly communicate the reason for taking the

firefighters out of bunker gear to the Players, nor was the simulated status of those firefighters communicated to the Players.

Lesson Learned: Controllers must communicate decisions made to other affected Controllers to ensure that all Players are given consistent input. Controllers must provide consistent input to Players to ensure that Players are given an opportunity to demonstrate proficiency and to provide a valid, objective evaluation of performance.

**To minimize the impacts on traffic patterns within F-Area, the Controller organization determined roadblock locations within F-Area prior to drill initiation. The Controller's traffic control plan did not completely isolate the drill area.**

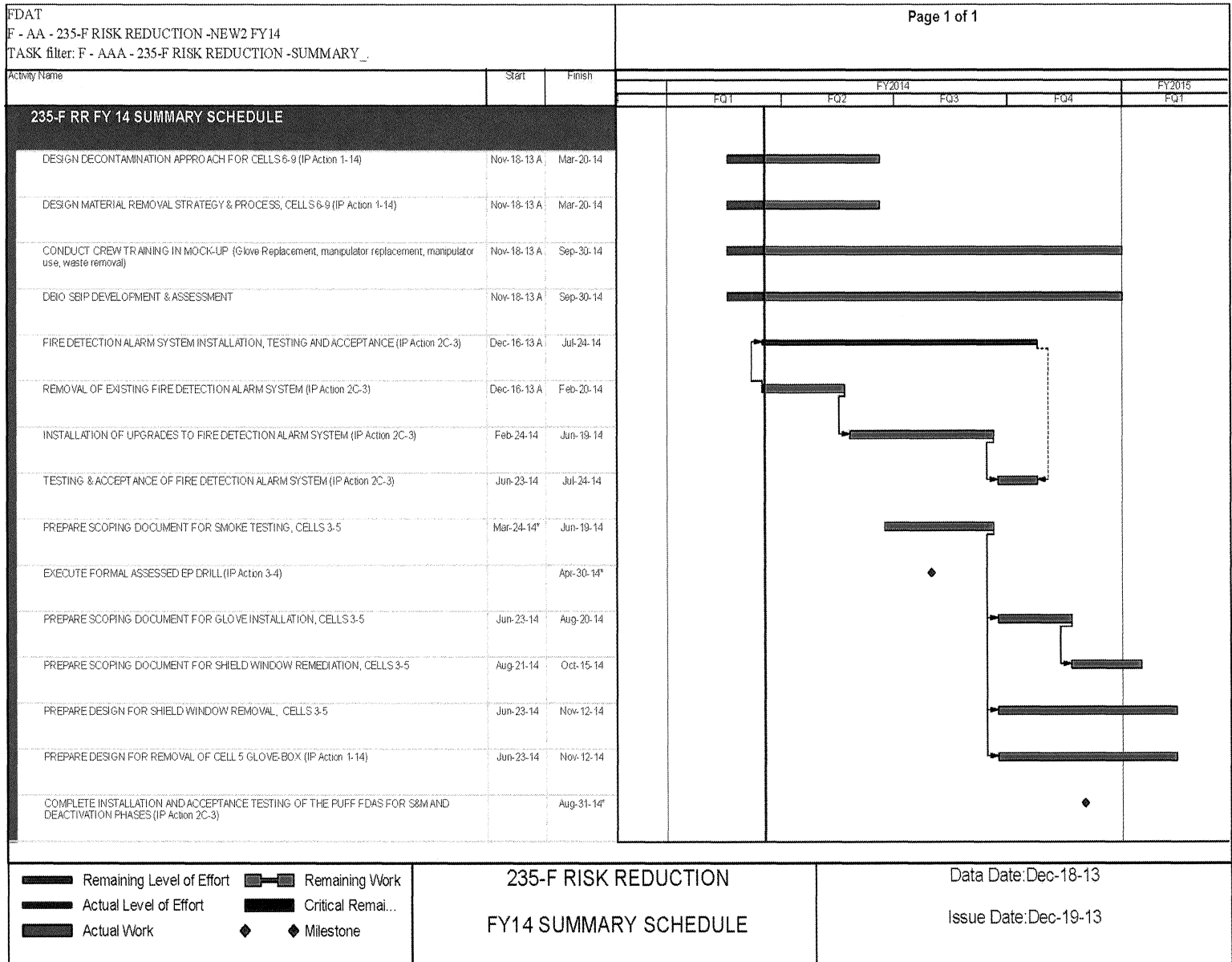
Lesson Learned: When limitations on drill conduct require Controllers to restrict Player actions, Controllers must ensure that planning is comprehensive to ensure that drill limitations do not create unexpected situations for Players to address.

All of the above lessons learned were distributed to appropriate personnel through a required reading. All lessons learned are evaluated for use during Controller/Evaluator Training. Issues with site-wide implication or significant potential to negatively affect either player performance or effective evaluation are discussed during training sessions. As course materials are revised, lessons learned from previous drills are incorporated directly into the training materials.

**Attachment 1**  
**Table of IP Actions Completed**

Action	IP MILESTONES COMPLETED IN 2013	Actual Completion Date
1-1	Complete project deactivation planning for PuFF Cells 1-9.	5/30/13
2a-1	Development of Building 235-F specific Transient Combustible Control Program.	2/15/13
2a-2	Evaluate fixed combustibles and define the fixed combustible removal, encapsulation, or isolation scope.	3/4/13
2b-1	Evaluate electrical components and define the scope for de-energization of components and the process for control of the resultant configuration.	3/4/13
2c-1	Complete evaluation of existing FDAS for functionality and maintainability.	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.	4/1/13
3-1	Develop a Calendar Year (CY) 2013 drill schedule for F-Area detailing planned frill dates involving Building 235-F including participation by all facilities and construction sites surrounding Building 235-F.	1/31/13
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.	2/28/13
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.	4/1/13
3-4	Execute at least one formally assess 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.	8/30/13
1-5	Update planning schedule to reflect PuFF cells 1 through 5 deactivation actions for the upcoming 12 months.	12/23/13
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>Note that this is required to be submitted in December of each year under the provisions of the IP.</i>	12/23/13
1-2	Issue the Building 235-F Deactivation BIO (which supersedes the S&M BIO) to include deactivation activities in PuFF cells 6-9.	12/23/13

Attachment 2  
235-F Risk Reduction Summary Schedule





**Attachment 3  
2014 F-Area Complex EP Drill Schedule**

## 2014 F-AREA COMPLEX EP DRILL SCHEDULE

Emergency Preparedness Coordinator: Batersa Mitchem  
Facility Point of Contact: William Tadlock

	MAY
Date	5/14/14
Type	235-F Radiological Release with Protective Actions  (Evaluated)  (MOX and SRR participation will be coordinated - both participated in FY13)

APPROVAL:

William Tadlock  
F-Area Complex Facility Manager

  
Signature

11/13/13  
Date