The Secretary of Energy
Washington, DC 20585

June 16, 2016

The Honorable Joyce L. Connery
Chairman
Defense Nuclear Facilities Safety Board
625 Indiana Avenue, NW, Suite 700
Washington, DC 20004

Dear Madam Chairman:

Enclosed is the Department of Energy's (DOE) Implementation Plan (IP) responding to the Defense Nuclear Facilities Safety Board (Board) Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant.*

The Department's response and acceptance letter, which was dated January 13, 2016, was published in the Federal Register on February 3, 2016.

DOE believes the enclosed IP is the most appropriate approach to implementing a more robust and self-sustaining Emergency Management Program at Pantex. The IP details a pragmatic and graded approach to address each of the three areas of concern identified by the Board in Recommendation 2015-1, which are the drill and exercise program, technical planning basis and decision-making tools, and providing timely and accurate information to the public regarding off-site radiological releases. The IP describes the actions to be taken to achieve successful implementation of the Recommendation.

We look forward to continued positive interactions with you and your staff. DOE will provide updates (with deliverables) to the Board on an ongoing quarterly basis until the IP is completed. Geoffrey L. Beausoleil, Manager, NNSA Production Office, has been assigned to be the Department's responsible manager for this Recommendation.

Should you have any questions, please contact either me or Mr. Geoffrey L. Beausoleil at (865) 576-0752.

Sincerely,

Ernest J. Moniz

Enclosure

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Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2015-1

Emergency Preparedness and Response at the Pantex Plant

June 2016

EXECUTIVE SUMMARY

On November 23, 2015, the Defense Nuclear Facilities Safety Board (DNFSB or the Board), approved Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant,* which identified three areas of concern with respect to the emergency preparedness and response capability at the National Nuclear Security Administration's (NNSA's) Pantex Plant: (1) inadequate drill and exercise programs, (2) no demonstrated capability to provide timely, accurate information to the public regarding off-site radiological releases, and (3) inadequate technical planning bases and decision-making tools. The deficiencies identified by the Board are with the implementation of existing requirements in DOE Order 151.1C, *Comprehensive Emergency Management System*, – not with the requirements themselves. The Department of Energy (DOE)/NNSA acknowledges the findings identified in the Recommendation and has developed this Implementation Plan (IP) to address those concerns.

The Pantex Emergency Management Program is capable of ensuring adequate protection of the public, environment, and workers at the Pantex Plant. The actions identified in this IP address the Board Recommendation through the enhancement of emergency preparedness and response at the Pantex Plant.

The methodology used to develop this IP included a series of self-critical causal analysis sessions employing subject matter experts (SMEs) in both emergency management and causal analysis; development of corrective actions addressing root causes and contributing factors; and identification of the associated milestones shown in Section 7 of this IP. Actions have been developed to address systemic and programmatic issues to allow for immediate improvement and to prevent reoccurrence.

The IP identifies the following significant causes and factors:

- There is no formal assignment of plant SMEs in the exercise and drill development process.
- The exercise schedule does not prioritize probability of event, consequence of event, or complexity of response.
- The Pantex Emergency Management Department was inadequately staffed during the Board's review period, in terms of both subject matter expertise and number of staff.
- Pantex does not incorporate all existing plant responders into the Emergency Response Organization (ERO) qualification program.
- Off-site radiological monitoring support is not provided during the initial response to a radiological event.
- Complex Emergency Actions Levels (EAL) were developed with the intention to reduce the likelihood of false alarms resulting in unwarranted emergency declarations and issuance of protective actions and protective action recommendations. This approach could result in delays in declaration of an emergency, implementation of protective actions, and providing protective action recommendations to the public.

During the causal analysis sessions, two overarching contributing factors were identified as contributing to all of the above significant causes and factors: (1) lack of sufficient management attention to effect improvement, and (2) inconsistent and ineffective contractor and Federal oversight of the program.

Prior to and during the DNFSB review period, though the need to improve was recognized by the managing contractor and NNSA, management attention and placement of resources were lacking, which resulted in limited progress towards improvement. Staffing of emergency management positions was accomplished through internal moves within the Pantex Plant and did not consider critical skills needed within the program. Emergency management budget resources fluctuated and overall plant-wide support was insufficient to fully implement needed improvements. As an example, inefficient management attention resulted in the inability to develop effective processes and procedures and continually improve EALs. A contributing factor was also insufficient staffing levels and inclusion of some staff that did not possess the skills necessary to accomplish identified needed tasks. This resulted in the ineffective implementation of requirements within the training and drills, exercise, consequence assessment, and notification and communication programmatic element.

Additionally, programmatic, contractor, NNSA Production Office (NPO), and DOE oversight was inconsistent prior to and during the review period. Contractor oversight of the program consisted of the completion of required internal management self-assessments with limited independent contractor reviews being conducted. Additionally, due to changes in NPO oversight personnel, NPO oversight was inconsistent and ineffective in driving change within the program. Though DOE Headquarter assessments were conducted, they did not result in significant changes to improve the program.

DOE is committed to achieving continuous improvement across its emergency management enterprise, including at the Pantex Plant. However, it is important to note that the Pantex Emergency Management Program has already made important improvements that have strengthened the program and its ability to respond appropriately. Improvement actions already completed or currently underway since the issuance of the 2015-1 report are identified later in this IP.

To address the issues identified in the Board Recommendation, this IP identifies actions intended to further improve performance in the drill and exercise program; the capability to provide timely, accurate information to the public regarding off-site radiological releases; and the technical planning bases and related decision-making tools. Actions identified to address the Board Recommendation include the development of a formalized SME-based Exercise and Drill Committee, ongoing revision and assessment of exercise and drill objectives, and formal education and communication with stakeholders. It also includes consistent radiological monitoring support for off-site monitoring, inclusion of all responders at Pantex into the ERO structure, and revision of the EALs.

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1. PURPOSE

The Pantex Emergency Management Program is capable of ensuring protection of workers, the public, and the environment. However, the Department of Energy (DOE) is committed to an improved Emergency Management Enterprise, and more specifically, to continuously improve emergency preparedness and emergency response capabilities at the National Nuclear Security Administration's (NNSA's) Pantex Plant. In particular, DOE recognizes that actions are needed to address deficiencies that were identified in Defense Nuclear Facilities Safety Board (DNFSB or the Board) Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant.* The actions identified in this Implementation Plan (IP) complement improvements completed or in progress since the review period on which the Board based Recommendation 2015-1. This IP identifies root causes and contributing factors that led to the deficiencies identified in the Recommendation, and actions to be taken or that have been taken to address the Board's recommendations to improve emergency preparedness and response at the Pantex Plant.

2. BACKGROUND

On November 23, 2015, the DNFSB approved Recommendation 2015-1, *Emergency Preparedness and Response at the Pantex Plant*. The Board published the Recommendation in the *Federal Register* on December 3, 2015, and amended its *Federal Register* Notice on December 10, 2015. The Recommendation was based upon interactions conducted from October 2012 to February 2015. The Recommendation included the following three Sub-recommendations:

1. *Ensure the Pantex Plant drill and exercise programs comprehensively demonstrate proficiency in responding to emergencies for all hazards, all facilities, and all responders, consistent with the technical planning bases and any updates to them, over a five-year period in accordance with DOE Order 151.1C (or subsequent revisions). As part of this demonstration of proficiency:*

    a. *Develop and institute a basis for conducting the drill program in support of emergency operations.*

    b. *Strengthen the exercise program to provide an adequate number of challenging scenarios per year, including at least one full-scale, site-wide exercise, in order to maintain qualifications and ensure proficiency of the emergency response organization and first responders.*

    c. *Conduct a comprehensive assessment of the drill and exercise programs bases, schedule, and execution against a risk-ranked set of:*
        i. *All hazards;*
        ii. *All facilities; and*

iii. All response elements.

d. Evaluate and improve the effectiveness of the NPO and contractor processes used to critique drills and exercises.

2. Develop and implement processes and demonstrate the capabilities to:

a. Ensure the timeliness and accuracy of notifications to State and local authorities is commensurate with the initiation of off-site release of radioactive material at the Pantex Plant.

b. Provide consistent radiological monitoring support if an accident releases radiological material off-site, until State resources arrive and can assume responsibility for off-site monitoring.

3. Evaluate, incorporate, and validate (correctness, completeness, and effectiveness), the following changes to the Pantex Plant decision-making tools and notification processes:

a. Evaluate the emergency action level (EAL) process for those accident scenarios identifiable solely via instrumented systems to reduce delays in determining and implementing protective actions.

b. For those accident scenarios that are not identifiable solely via instrumented systems, evaluate the range of emergency conditions and potential indicators, and identify where new monitoring systems can be added or existing administrative controls can be modified to improve timeliness of response.

c. For all scenarios, evaluate if some protective actions should be initiated based solely on initial indicators (i.e., a precautionary evacuation) while confirmatory indicators are sought.

d. Upon completion of these evaluations, incorporate new guidance and training for any changes made to the EAL decision-making tools and notification processes into the drill and exercise program.

DOE/NNSA understands Recommendation 2015-1, and recognizes the importance of correcting the deficiencies in the implementation of existing requirements to ensure the adequate protection of the public and the workers at the Pantex Plant. On January 13, 2016, the Secretary of Energy accepted Recommendation 2015-1. This IP was developed in coordination with DOE Headquarter elements, the NNSA Production Office (NPO), and Consolidated Nuclear Security, LLC (CNS) senior leadership.

3. UNDERLYING CAUSES

DNFSB Recommendation 2015-1 identified inadequate implementation of current requirements as the underlying cause resulting in the recommendations identified by the Board. Although DOE has indicated in the implementation plan for DNFSB Recommendation 2014-1, *Emergency Preparedness and Response*, that it will revise and update DOE Order 151.1C, *Comprehensive Emergency Management System*, DOE acknowledges the need to address the Board's concerns within Recommendation 2015-1 consistent with the current version of DOE Order 151.1C.

A series of causal analysis sessions employing a Pantex senior level excellence team and subject matter experts (SMEs) in emergency management were conducted to develop appropriate corrective actions allowing for immediate improvement and to prevent reoccurrence. The Casual Analysis and Mistake Proofing process was utilized to perform an in-depth analysis of the three sub-recommendations provided by the Board to determine contributing factors (Contributing Factors or CFs) and root causes (Root Causes or RCs) of the issues. The analysis identified the following Contributing Factors and Root Causes. In some cases, the causal analysis identified factors that contributed to more than one of the deficiencies, as identified by the Board in the sub-recommendations.

Inadequate Drill and Exercise Programs:

- There is no formal assignment of plant SMEs in the exercise and drill development process – Root Cause (RC1). The lack of consistent involvement of SMEs across Plant disciplines and off-site entities in drill and exercise planning contributes to issues with scenario realism and less than extensive play in some cases by all relevant facilities, systems, and responders.
- There is no formal communication of the long and short-range exercise plans to stakeholders – Root Cause (RC2). This hinders the incorporation of input from all stakeholders and their associated planning and full participation.
- Pantex does not incorporate all plant emergency response elements into the Emergency Response Organization (ERO) qualification program – Root Cause (RC3). While organizations such as Occupational Medicine and Radiation Safety have maintained separate qualification and drill programs, and participate in plant-wide exercises, formal incorporation into the ERO will ensure responder training, qualification, and participation consistent with the rest of the ERO.
- The Emergency Management Department (EMD) was inadequately staffed during the Board's review period, in terms of both subject matter expertise and number of staff – Root Cause (RC4). Several personnel with little or no emergency management background were assigned to EMD from other departments. A section manager position was not backfilled, and sections were combined under a single manager. Due to these staffing shortages, staff were overwhelmed, and strained to address program repair and program maintenance concurrently.

- There is limited independent assessment of exercise and drill objectives or criteria – Contributing Factor – (CF1). Inconsistent and inadequate participation and review by all plant disciplines, tenants, and external entities precludes appropriate input and feedback, which in turn hinders rigorous participation and demonstration of proficiency by all stakeholders.
- Critical exercise evaluation criteria are not fully identified – Contributing Factor (CF2). Without meticulous development and vetting of evaluation criteria by all stakeholders, this deficiency contributes to objectives and criteria that were in some cases not applicable, or failed to result in rigorous and self-critical evaluation.
- There is no formal process for the establishment of the yearly drill schedule consistent with the technical basis – Contributing Factor (CF3). Though a documented drill program exists, the process is inconsistently followed and does not result in the conduct of comprehensive and complex drills. This contributes to gaps in drilling all hazards, facilities, and responders, and precluded a truly incremental and progressive system of practice and demonstration of proficiency before going into more demanding exercises under full evaluation.
- The exercise schedule does not prioritize the probability of event, consequence of event, or complexity of response – Contributing Factor (CF8). This hinders implementation of a prioritized or graded approach to frequency and type of exercise scenarios.

No Demonstrated Capability to Provide Timely and Accurate Information to the Public Regarding Off-Site Radiological Releases:

- Radiological monitoring support is not provided during the initial response to a radiological event – Root Cause (RC5). With State of Texas resources located approximately 6-7 hours from Pantex, no "ground truth" validation of plume dispersion modeling would occur in off-site areas during the initial response stage.
- Complex EALs were developed with the intention of reducing the likelihood of false alarms resulting in unwarranted emergency declarations and issuance of protective actions and protective action recommendations – Root Cause (RC6). This could result in delays to event categorization, classification, and/or notification.
- There is no automated or electronic approval process for release of ongoing consequence assessment data to off-site agencies, which could aid in providing more timely information – Contributing Factor (CF4). The practice of faxing and/or emailing requires time-consuming steps that potentially delay providing products such as plume dispersion plots, notification forms, and media releases.
- Some Consequence Assessment Team, Plant Shift Superintendent (PSS), and Off-Site Liaison Coordinator personnel lack experience and training to ensure consistent and accurate relay of information – Contributing Factor (CF5). This contributes to the likelihood of off-site agencies not fully understanding critical information such as event conditions or protective action recommendations.

- Due to the aging infrastructure at the Pantex Plant, some instrumented systems used as initial indicators have a potential to produce false alarms, which led to the development of EALs that include confirmatory steps – Contributing Factor (CF6). These confirmatory steps require time to complete, comprising part of the 15-minute notification requirement.
- Protective Action Recommendations, plume-modeling output, or all hazard scenarios at Pantex are not fully understood by off-site officials – Contributing Factor (CF7). This contributes to the likelihood of misinterpretation, with associated risk for inaccurate implementation of protective actions for off-site populations.

Inadequate Technical Planning Basis and Decision-Making Tools:

- Complex EALs were developed with the intention of reducing the likelihood of false alarms resulting in unwarranted emergency declarations and issuance of protective actions and protective action recommendations – Root Cause (RC6). This could result in delays to event categorization, classification, and/or notification. For most events at Pantex, there is no avenue to implement precautionary site-wide protective actions until declaration of an emergency – Root Cause (RC7). This precludes personnel from taking potentially critical protective actions during the initial stages of an event.
- Though there is a documented technical basis for the program, neither the Emergency Planning Hazards Survey nor Emergency Planning Hazards Assessment (EPHA) have been approved by the NPO – Root Cause (RC8). As a result, the EM program is non-compliant with DOE O 151.1C, and there are scenarios in the published EPHA that are not reflected in the EALs.
- Due to the aging infrastructure at the Pantex Plant, some instrumented systems used as initial indicators have a potential to produce false alarms, which led to the development of EALs that include confirmatory steps – Contributing Factor (CF6). These confirmatory steps require time to complete, comprising part of the 15-minute notification requirement.

Two overarching Contributing Factors that were identified as resulting in Contributing Factors and Root Causes above were: (1) ineffective management, which resulted in excessive staff turnover, insufficient and ineffective staff, and changing organization of the Federal and contractor emergency management programs; and (2) inconsistent and ineffective contractor and Federal oversight of the program. In particular, the contractor self-assessment process and Federal oversight guidelines were inconsistently implemented during the review period, resulting in inadequate and delayed implementation of programmatic improvements.

4. BASELINE FACTS AND ASSUMPTIONS

- IP actions will not disrupt day-to-day operations of the Pantex Plant.
- Improvement items identified in this IP will be implemented by CNS Emergency Management and NPO, and will be documented and tracked to completion through the

CNS Problem Evaluation Report (PER) and Electronic Status And Routing System (E-STARS) tools, and the NPO ePegasus Issues Management System (ePegasus System).

- This IP incorporates requirements, as they currently exist in DOE O 151.C, *Comprehensive Emergency Management System*.

5. SUMMARY OF COMPLETED AND NEAR-TERM ACTIONS

Separate from and prior to the development of this IP, CNS has implemented a number of initiatives and actions to improve the effectiveness of emergency preparedness and response across the CNS Enterprise, and Pantex in particular. These actions were in recognition of the need to not only continuously improve the program, but to address self-critical evaluation and assessment. In July of 2015, emergency management was identified as a CNS Enterprise Key Initiative for Pantex and the Y-12 National Security Complex. The objective of this Key Initiative is to create a comprehensive, effective, and self-sustaining emergency management system across Pantex and Y-12. As part of the Key Initiative, a number of shared processes and technologies were implemented across the CNS Emergency Services Enterprise in addition to key staffing actions and other Pantex specific improvements.

A common operational excellence model for emergency management has been established driving consistency across the Enterprise. Based on the common operational excellence model, the CNS Enterprise Emergency Management Improvement Plan has been developed separate from this IP and includes an additional revision to the technical planning basis documents separated into geographical regions, as directed by NPO, and revisions to Emergency Plan Implementing Procedures to mirror the elements of DOE O 151.1C. Plans, procedures, guides and operator aides have been uniformly developed to ensure consistent implementation of requirements, leveraging best practices from across the DOE/NNSA Enterprise. In February 2014, the Emergency Planning Hazards Survey and Hazards Assessment were revised to include the most current hazard information and to incorporate additional hazard scenarios and comments received from reviews conducted by both NNSA and contractor personnel. NPO has agreed with the CNS hazard screening process and the identification of locations requiring further analysis in the Hazard Assessment. Those locations have been included in the revision of the Hazards Assessment that has been published and submitted to NNSA for review and approval. The “Active Shooter” EAL has been revised to administratively eliminate delays in providing protective actions to workers, and in concert with this IP, all other EALs, including EALs requiring both instrumented and non-instrumented initial indicators, will be evaluated and revised to decrease or eliminate delays.

The exercise process has been integrated within the DOE/NNSA Enterprise, leveraging resources between Pantex and Y-12 to improve responder proficiency and exercise conduct. Capitalizing on Y-12’s nationally recognized expertise in exercise design and conduct, Exercise Builder software, which was developed by DOE, has been implemented at Pantex; thus utilizing a common exercise planning process across the Enterprise to expand to three exercises scheduled for FY 2016. Pantex and Y-12 have provided exercise support to each other as

exercise controllers and evaluators during FY 2015 and 2016 drills and exercises to improve the effectiveness of the exercise critique process, with Pantex implementing guidelines for controllers and building wardens to perform drill and exercise critiques. Collaboration between exercise directors at Pantex and Y-12 and utilizing controllers and evaluators from across the CNS Enterprise has allowed for the identification of process improvements in both the exercise critique process and in the ERO. CNS Communications and Public Affairs provided personnel, process, and training in support of the Pantex Emergency Public Information Program. Enhancements include the ability to provide timely emergency information to off-site partners and media using social media, methods to obtain more timely release of information, and Joint Information Center staff training.

The training and drill process has been enhanced, both within the Emergency Management Department and for the ERO cadre. Recognized certifications in emergency management and Continuity of Operations (COOP) have been attained within the Department. National Incident Management System/Incident Command System (NIMS/ICS) courses were emphasized to establish unified command for fire and security responders. Training across teams and incorporating the lessons learned process is also playing a part in building cohesion across the ERO. Increased emphasis has been placed on being self-critical, implementing a plant-wide drill and exercise committee to plan rigorous objectives and evaluation criteria as well as provide guidelines for controllers and building wardens for holding critiques. Additional emphasis is also placed on identifying and correcting weaknesses from drills and exercises, utilizing the CNS Causal Analysis Report/Corrective Action Plan (CAR/CAP) process, and tracking corrective actions to closure through the CNS PER and E-STARS tools, as well as the NPO ePegasus System. These tools are institutionalized by CNS and NPO, and incorporate verification and validation quality checks to ensure actions are completed and effective. Future budget planning has been developed to include funding for the sustainment of these actions.

Emergency management technologies have been integrated across the CNS Enterprise to enable a common operational approach and shared situational awareness at both sites. Notification capabilities were combined into a single contract for an externally hosted notification/communications system in October 2015, providing increased capability and efficiency for notification of the Pantex ERO and Balance of Plant personnel. The Emergency Management Information System (EMInS), developed and used at Y-12, has been customized for Pantex, and Phase I implementation at Pantex was completed in December 2015. EMInS has been successfully used at Y-12 and has been recognized as a best practice for emergency information management within DOE. EMInS is utilized to effectively manage emergency event information including significant events, review and submittal of emergency public information, consequence assessment data and increased situational awareness throughout the response organization. Phase I use of EMInS was limited to the Pantex ERO and has been validated as effective. Phase II is to be completed by December 2016. Continued phased implementation of this software includes enhanced Geographical Information System (GIS) capabilities and off-site agency access to emergency information.

Staffing actions have been taken correcting previous management inattention by filling key emergency services management positions. This includes the Senior Director of Enterprise Emergency Services in May 2015, the Director of Pantex Emergency Services in July 2015, and the Manager of the Pantex Emergency Management Program in August 2015. The Senior Director of Enterprise Emergency Services is responsible for integrating the CNS Emergency Management Program across both Pantex and Y-12 through the identification and implementation of best practices. The Pantex Director of Emergency Services is the most senior manager at Pantex for Emergency Services and has the ability to request the support of the Pantex Plant Manager. Several additional critical positions were filled within the EMD to address both attrition and additional needs, including two technical planning basis analysts, two training and drills specialists, three plant shift superintendents, one issues management and causal analysis professional, and two professionals coordinating and administering a program of seventeen Management Self-Assessments for Fiscal Year (FY) 2016. A nationally recognized subcontractor in the area of technical planning basis has been incorporated into the team. EMD was restructured to establish a more effective span of control and focus on program elements, expanding to three sections encompassing the operations center; emergency plans and procedures; and training, drills, and exercises. In association with this IP, CNS will conduct a comprehensive staffing study to determine tasks required, labor required to achieve task, and skills required to fill full time positions within the program to ensure adequate and sustainable staffing is identified. The staffing study will be used as the baseline labor need for outlying years, and the results will be used to fill positions resulting from future attrition.

Pantex currently has an aging infrastructure of alarm systems; however, in conjunction with the long-term infrastructure revitalization initiative, both the fire alarm system and radiation alarm monitoring system are scheduled for replacement. Mastermind, the fire alarm system monitoring software, is budgeted for replacement in FY 2017. The radiation alarm monitoring system has been included in the **s**cope of the Bay and Cell Upgrade Project and is scheduled for completion in FY 2020. Further actions described in this IP will enhance the capability to initiate protective actions for plant personnel and provide protective action recommendations to off-site officials without reliance on the replacement of the infrastructure.

The drill and exercise program was expanded in FY 2015, implementing more formality and rigor. Training is incorporated into the drills, focusing on individual response elements and coordination and interaction between response elements. Exercise objectives and evaluation criteria have been refined and loaded into the Exercise Builder tool to allow traceability across all program elements, to establish more objective and self-critical evaluation, and to drive consistency within and across the entire ERO cadre. Demonstrating program improvement, the August 2015 exercise successfully demonstrated the ability to develop, conduct, and evaluate a rigorous and challenging full-scale exercise. This exercise incorporated plant-wide participation, integration with off-site agencies, events at multiple facilities, and validation of a revised Emergency Public Information process. Additionally, this exercise demonstrated improvements to integration with external entities, consequence assessment, and the ability of the controllers and evaluators to be self-critical, meeting objectives in these areas and

reflecting improvements since the Board's evaluation period and prior to the issuance of the Recommendation.

6. SAFETY ISSUE RESOLUTION

DOE has identified the following areas to address the Board's recommendation and to supplement previously identified improvements and corrective actions completed or in progress. DOE has determined these actions to be appropriate for continuously improving emergency preparedness and response at the Pantex Plant in a measured and effective manner.

All actions will be verified and validated by the contractor for effectiveness in accordance with the DOE O 151.1C Contractor Requirements Document, and reviewed for quality of implementation. Verification and validation will be accomplished throughout the completion of this IP through the EM Readiness Assurance process by the completion of self-assessments, drills, and exercises, as necessary.

During performance and execution of oversight activities, NPO will focus oversight and assessment activities on actions associated with this IP to validate and verify effectiveness in conjunction with the appropriate DOE O 151.1C element review.

All completed milestones will be validated for effectiveness, as applicable, and included in the corresponding quarterly update, as identified in Table 1.0, for submittal to the Board. In order to ensure sustainment of improvement, continued validation of effectiveness will be ongoing through Federal oversight activities and improvements in the contractor Readiness Assurance process.

NNSA will facilitate an Independent Effectiveness Review of NNSA oversight and contractor corrective actions as an independent verification and validation of completed actions from this IP.

6.1 Improve the Development, Conduct, and Performance of Drills and Exercises

6.1.1 Sub-recommendation 1.a - Pantex emergency management has recently strengthened the drill and exercise program by formalizing a site level Pantex Drill & Exercise Committee (PDEC). This committee is governed by a charter identifying roles and responsibilities, and consists of assigned representatives from areas across the plant site and off-site officials, including all responder organizations. The committee will meet on a regular basis to plan and coordinate their organization's participation in drills and exercises. Each member of the committee is responsible for providing input on:

- level of play,
- appropriate objectives and criteria for each drill/exercise,

- drill/exercise scenario for realism,
- exercise conduct or simulation as needed, and
- review and approval of the package for content and participation.

Membership from each organization, including Pantex response organizations, tenants such as the Office of Secure Transportation (OST) and the Weapons Evaluation Testing Laboratory (WETL), and off-site officials, as applicable, will enhance the Emergency Management Program's ability to provide scenarios that are commensurate with identified hazards represented at Pantex and ensure all plant responders have the opportunity to demonstrate capabilities. The response organization's committee members will also provide a schedule of drills that their organization will be conducting. This will provide the opportunity to discuss and resolve any scheduling conflicts for maximum level of participation. The formalization of the PDEC, fully supported by senior management, will enhance the planning process with improved scenario accuracy and realism. The PDEC will also help ensure a more knowledgeable and self-critical controller and evaluator cadre. The purpose of the committee and roles and responsibilities of its members will be documented in appropriate emergency management manuals, reporting forms, and work process documents.

The Pantex Emergency Management Program will identify the process for development of the annual EM Milestone Schedule to include drills that will demonstrate proficiency of the ERO consistent with the technical planning bases in support of emergency operations.

To ensure effectiveness of the implementation of the actions and to ensure long-term sustainability of the improvements, a comprehensive staffing study will be conducted to determine the number of needed staff and the skills required to maintain as well as repair the program. Once identified, the budget necessary to continue to support the needed staffing levels will be planned and executed in the outlying years. All emergency management job descriptions and requirements will be updated to include the specific knowledge, skills, and abilities needed.

6.1.2 Sub-recommendation 1.b - Pantex is supplementing existing Order requirements by reviewing plant hazards identified in the Emergency Planning Hazards Assessment to establish a frequency for conduct of exercises and drills based on the probability of occurrence, consequence of event, or complexity of response. Those events deemed to have higher probability, greater consequence, and greater complexity of response will be weighted more to ensure the appropriate frequency of exercises is conducted. Based on this review, an adequate number of challenging scenarios will be established to include at least one full-scale exercise conducted annually. This approach promotes a prioritized or graded method for establishing the appropriate frequency and type of exercise scenarios, and increased ability to develop and demonstrate response proficiency. Both the 5-Year Exercise Schedule and EM

Milestone Schedule will be communicated to CNS and NNSA senior leadership annually to ensure support and commitment of applicable plant resources to complete all scheduled drills and exercises.

6.1.3 Sub-recommendation 1.c – Pantex is setting a renewed vision for incorporating an all-hazard, all-facilities, all-responder approach. Pantex will conduct a risk ranked comprehensive assessment of the drill and exercise program basis, schedule, and execution. The 5-Year Exercise Schedule will incorporate risk rankings for all hazard scenarios, facility types from the Technical Planning Basis, and required response capabilities. The ERO will be expanded to incorporate additional established responder elements and associated equipment. This will help ensure training, qualification, and participation for these responder elements is consistent with the rest of the ERO. While these responder elements currently receive rigorous "skill of the craft" training essential to their response duties, higher level ERO structure training will also enhance their skill and capabilities for a coordinated interface and response. Additionally, participation in drills and exercises demonstrating proficiency will be tracked for responder qualification. Pertinent emergency management documents will be revised to reflect this methodology.

6.1.4 Sub-recommendation 1.d - The Emergency Management Program will evaluate and improve the effectiveness of the NNSA and contractor process used to critique drills and exercises. Guidelines will be developed and documented for use by both controllers and building wardens for conducting a "hot wash" following drills and exercises. An emergency response feedback process will be formalized and documented to include input from ERO responders, building wardens, and Balance of Plant personnel in order to collect feedback following exercises and for inclusion in the After Action Report. These process updates will be incorporated into the Control and Evaluation of Drill and Exercise training course for those individuals with controller and evaluator responsibility. An emergency response lessons learned process will be implemented to address past deficiencies and opportunities for improvement. These activities will help strengthen self-critical evaluation of response proficiency.

Critical evaluation criteria within drill and exercise objectives will be developed to better assess objectives and improve the process used to critique drills and exercises. Exercise objective and evaluation criteria will be reviewed and updated annually by members of the PDEC. These revised objectives and criteria will be utilized in the Exercise Builder tool for enhanced development and self-critical evaluation of drills and exercises.

CNS will evaluate and improve the Readiness Assurance process at Pantex through the identification and implementation of best practices. CNS will develop staff to effectively assess the program and identify concerns, allowing for continued sustainment of the program.

NPO-20 will evaluate Oversight Process NPO-3.4.1.1, and update the NPO-20 Survey Guide to include emergency management. A review of CNS exercise criteria will be completed to ensure critical exercise evaluation criteria are identified. NNSA will assess drills and exercises conducted by CNS to include planning, execution and evaluation. Additionally, NNSA will facilitate an Independent Effectiveness Review of NNSA oversight and contractor corrective actions as an independent verification and validation of completed actions from the IP.

6.2 Improving the Capability to Provide Timely Information to the Public Regarding Off-site Radiological Releases

6.2.1 Sub-recommendation 2.a - In order to establish a common understanding by off-site agencies on the kind of protective action information Pantex will provide, the methods used to produce it, and the timing to provide it, Pantex Emergency Management will offer recurring semi-annual briefings to off-site agencies and tenants on the process Pantex uses for the development of off-site Protective Action Recommendations (PARs), the creation of plume dispersion plots, and the format of information provided to off-site agencies. Additionally, Pantex Emergency Management will offer briefings to personnel with the need to know describing the hazards present at Pantex. This will help avoid any misinterpretation by off-site agencies, and reinforce correct implementation of protective actions for off-site populations.

The Initial Notification Form will be evaluated and revised to improve efficiency and timeliness in reporting. The Initial Notification Form will be incorporated into EMInS allowing for more timely completion by the Plant shift superintendents and automated distribution. This will ultimately decrease the time to notify off-site agencies of emergency events and PARs. Plant tenants will be included in the notification process to ensure needed information on emergencies is communicated to all partners accordingly.

Off-site agencies will be offered an opportunity to participate in planning efforts to enhance their access to EMInS as part of phased implementation, and will be offered user training on these improvements to EMInS. Phase II implementation of EMInS will include off-site access to event information, PARs, media releases, plume models, and other information critical to off-site agencies. These enhancements are scheduled for completion and implementation in December 2016. EMInS Phase II will undergo a complete Software Quality Assurance review and will be tested in drills and exercises conducted in 2017 to ensure effectiveness.

Consequences Assessment Team members, Plant shift superintendents, off-site liaisons, and executive team members will be trained to provide required information and products to off-site officials in a consistent and accurate manner. This will increase the confidence and reproducibility in information released.

6.2.2 Sub-recommendation 2.b – To conduct timely verification of consequence assessment data during an accident releasing radiological material off-site and in consideration of the time needed for State of Texas assets to reach Pantex from Austin, Pantex will evaluate and identify events in which consistent radiological monitoring support is needed until state resources arrive. In coordination with the State of Texas Department of State Health Services (DSHS) and the Pantex Radiation Safety Department, Pantex emergency management will identify methods to support, identify and obtain needed field-monitoring equipment, develop coordination protocol, and incorporate the support into the ERO structure and processes, to include training, drills, and exercises.

6.3 Improving the Pantex Plant Decision-Making Tools and Notification Processes

6.3.1 Sub-recommendation 3.a – Pantex has a set of EALs designed to provide preauthorized criteria for emergency classification, notification, and reporting. In order to improve upon the existing EALs, the CNS Emergency Management Program will evaluate the EAL process to identify opportunities to reduce delays in determining and implementing emergency categorization/classification, protective actions, and protective action recommendations. This evaluation will be performed for all accident scenarios to include those identifiable solely by instrumented systems. The intent of this evaluation is to reduce delays to event categorization, classification, protective actions/recommendation, and/or notification.

6.3.2 Sub-recommendation 3.b - For accident scenarios not identifiable solely by instrumented systems, the range of emergency conditions and potential indicators will be evaluated by CNS for new monitoring systems to be added, or modification of existing administrative systems, to improve timeliness of responses. This will improve the timelines of a response during the initial stages of an event.

6.3.3 Sub-recommendation 3.c - The CNS Emergency Management Program will evaluate all scenarios to determine if protective actions should be initiated based solely on initial indicators while confirmatory indicators are sought. In addition, scenarios will be evaluated which could escalate and result in a precautionary recommendation for evacuation of special populations off-site. This will enhance the ability of personnel to take critical protective actions during the initial stages of an event.

6.3.4 Sub-recommendation 3.d - The Emergency Planning Hazards Assessment will be updated by CNS to include changed hazard information not included in the published revision and submitted to the NNSA for approval. The NNSA will review and approve Emergency Planning Hazards Assessment as necessary. EALs will be revised by CNS and published based on the evaluations above and will include information identified during the revision of the Emergency Planning Hazards Assessment. EAL decision-making tools will be implemented into the phased deployment of EMInS for initial consequence assessment to enhance timely and

accurate declaration and notification of off-site agencies. In addition, the ERO and PSS will receive information and training reflective of the revised EALs. Drills and exercises will be conducted to ensure proficiency and effectiveness. The above evaluations and incorporation of the results into revised EALs will decrease time taken to appropriately identify emergency conditions, categorize and classify events, implement protective actions, and provide protective action recommendations.

7. MILESTONES

The actions below have been identified to address DNFSB Recommendation 2015-1 in a measured and effective fashion. Table 1.0 lists milestones identified from a causal analysis process for the identified sub-recommendations.

Milestones listed in Table 1.0 are actions that demonstrate full implementation and formalization into the EM Program. All necessary supporting activities, e.g., training, drills, assessments, etc., will be identified, tracked for completion, and completed prior to declaration of completeness of full implementation. All records will be maintained as required.

All actions will be verified and validated by the contractor for effectiveness in accordance with DOE O 151.1C and reviewed for quality of implementation. Verification and validation will be accomplished throughout the completion of this IP through the EM Readiness Assurance process by the completion of self-assessments, drills, and exercises, as necessary.

During performance and execution of oversight activities, NPO will focus oversight and assessment activities on actions associated with this IP to validate and verify effectiveness in conjunction with the appropriate DOE O 151.1C element review.

All completed actions will be validated for effectiveness, as applicable, for inclusion in the applicable quarterly update provided to the Board. In order to ensure sustainment of improvement, continued validation of effectiveness will be ongoing through Federal oversight activities and improvements in the contractor Readiness Assurance process.

NNSA will facilitate an Independent Effectiveness Review of NNSA oversight and contractor corrective actions as an independent verification and validation of completed actions from this IP.

Table 1.0 – Implementation Plan for Recommendation 2015-1 Milestones

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.1.1	Determine necessary staffing level of Emergency Management and skills needed to maintain as well as repair the program. **(RC4)(Management Attention)**	Staffing Study / CNS	Quarterly Update #1
6.1.1	Update EM job descriptions to reflect knowledge, skills, and abilities required to maintain the program. **(RC4))(Management Attention)**	EM Position Descriptions and Job Requirements / CNS	Quarterly Update #1
6.1.1	Formalize staffing requirements in Pantex Comprehensive Emergency Plan. **(RC4)(Management Attention)**	Published Pantex Plant Comprehensive Emergency Management Plan / CNS	Quarterly Update #2
6.1.1	Implement through the update and publication of the Training and Drills Program Manual : • Pantex Drill and Exercise Committee roles and responsibilities, • Basis for development of the annual EM Milestone Schedule to include drills that will demonstrate proficiency of the ERO consistent with the technical planning basis, and • Drill and Exercise Reporting Form to formally track Department/Division drills and exercises **(RC1, CF1, CF2, CF3)**	Published Training and Drills Program Manual / CNS	Quarterly Update #2
6.1.1	Implement through the update and publication of the Exercise Manual: • Pantex Drill and Exercise Committee roles and responsibilities **(RC1, CF1, CF2)**	Published Exercise Manual/CNS	Quarterly Update #2
6.1.2	Implement through the update and publication of the Exercise and Training and Drill Manuals:	Software Quality Assurance Documentation,	Quarterly Update #2

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
	• Exercise Builder Software at Pantex **(RC1)**	Published Training and Drills Program Manual and Exercises Manual / CNS	
6.1.2	Evaluate the 5-Year Exercise Schedule to include any additional hazards identified in the EPHA to meet the requirements of DOE O 151.1C **(RC8)**	Updated 5-Year (2016-2020) Exercise Schedule / CNS	Quarterly Update #1
6.1.2	Implement through the update and publication of the Exercise Manual: • Process and components for the development of the 5-Year Exercise Schedule, • Process for obtaining concurrence from the participating Drill and Exercise committee members for each exercise, and • Requirement to conduct annual briefing of short and long-range plans with senior management **(RC1, RC2)**	Published Exercise Manual / CNS	Quarterly Update #2
6.1.2	Evaluate hazards identified in the EPHA and identify those hazards with a higher likelihood, greater consequence, or increased complexity of response for inclusion into the 5-Year Exercise Schedule. **(CF8)**	Updated 5 Year (2016-2020) Exercise Schedule / CNS	Quarterly Update #1
6.1.3	Develop an Emergency Response Organization Element Table for the 5-Year Exercise Schedule **(RC3)**	Updated 5 Year (2016-2020) Exercise Schedule / CNS	Quarterly Update #1
6.1.3	Conduct a risk ranked comprehensive assessment of the drill and exercise program basis, schedule, and execution **(CF8)**	Contractor Assessment Report / CNS	Quarterly Update #1

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.1.3	Implement through the update and publication of new team procedures, Pantex Plant Comprehensive Emergency Management Plan, and the Emergency Response Organization Manual: • Additional response elements incorporated into the ERO **(RC3)**	Published Pantex Plant Comprehensive Emergency Management Plan and Emergency Response Organization Manual / CNS	Quarterly Update # 3
6.1.4	Develop and publish a Drill and Exercise Hot Wash Checklist to be used by controllers and building wardens to critique drills and exercises **(RC1)**	Published Drill and Exercise Hot Wash Checklist / CNS	Completed Closure will be provided in Quarterly Update #1
6.1.4	Implement through the update and publication of Training and Drills Program Manual, Exercises Manual, and Readiness Assurance Manual: • Emergency Response Lessons Learned process **(RC1)**	Published Training and Drills Program Manual, Exercises Manual, and Readiness Assurance Manual / CNS	Quarterly Update #2
6.1.4	Implement through the update and publication of the Building Warden Handbook and Building Warden Checklist: • Use of the Drill and Exercise Hot Wash Checklist **(RC1)**	Published Building Warden Handbook Checklist / CNS	Quarterly Update #2

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.1.4	Evaluate and implement resulting improvements through the update and publication of the Readiness Assurance Manual: • Requirements for an effective contractor self-assessment program • Sustainment of improvements through identification and implementation of best practices **(Oversight)**	Published Readiness Assurance Manual / CNS	Quarterly Update #2
6.1.4	Evaluate NPO Oversight process 3.4.1.1, and NPO Oversight Planning Process 3.1.2 **(Oversight)**	Revised process documents/package / NPO	Completed Closure will be provided in Quarterly Update #1
6.1.4	Update Safeguards & Security Survey Guide to include Emergency Management as needed **(Oversight)**	Revised documents / NPO	Quarterly Update #1
6.1.4	Review and evaluate the NNSA Emergency Management Oversight Planning Process (to include drills and exercises) to be incorporated in the S&S Oversight Guide **(Oversight)**	Revised process documents/package / NPO	Quarterly Update #1
6.1.4	Evaluate the CNS critical criteria for completion within objectives for drill and exercise conduct **(Oversight)**	Evaluation / NPO	Quarterly Update #1
6.1.4	Conduct assessment of drills and exercises to include the contractor's planning, execution, and evaluation **(Oversight)**	Assessment Report / NPO	Quarterly Update #3

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.2.1	Implement through the update and publication of Off-site Interface Manual: • Recurring briefings to off-site officials on the Pantex process of developing Protective Action Recommendations (PARs), and describing the process for providing plume models via e-mail and EMInS, and hazard scenario information **(CF7)**	Published Off-Site Interface Manual / CNS	Quarterly Update #2
6.2.1	Develop and deliver applicable training for Consequence assessment Team, PSS, Off-Site Liaison Coordinator, and Executive Team to promote consistent and accurate release of information. **(CF5)**	Training Completion Report / CNS	Quarterly Update #2
6.2.1	Implement Phase II of EMInS at Pantex: • Incorporate *Initial Notification Form* into EMInS to improve efficiency/timeliness, • Incorporate a plume model approval process through EMInS, • Incorporate initial consequence assessment tool, and • Implement external access to EMInS for AIP principals. **(CF4)**	Software Quality Assurance Document / CNS	Quarterly Update #3

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.2.2	Implement through the update and publication of Pantex Plant Comprehensive Emergency Management Plan, Emergency Response Organization Manual, and the Consequence Assessment Manual: • Events requiring radiological monitoring support, • Radiological monitoring support capabilities, and • Coordination with state and local officials. **(RC5)**	Pantex Plant Comprehensive Emergency Management Plan, Emergency Response Organization Manual, Consequence Assessment Manual / CNS	Quarterly Update # 3
6.3.1	Evaluate the EAL process to reduce delays in determining and implementing protective actions and protective action recommendations **(RC6, RC7, CF6)**	Memo to EM Department Manager on recommendations / CNS	Quarterly Update #1
6.3.2	Evaluate the EAL process for the range of emergency conditions and potential indicators to determine if new monitoring systems can be added, or modification of existing administrative systems can be performed to improve timeliness of response. **(RC6, RC7, CF6)**	Memo to EM Department Manager on recommendations / CNS	Quarterly Update #1
6.3.3	Evaluate if protective actions should be initiated for all scenarios based solely on initial indicators while confirmatory indicators are sought **(RC6, RC7, CF6)**	Memo to EM Department Manager on recommendations / CNS	Quarterly Update #1
6.3.4	Submit updated letter to NNSA revising schedule identified in SS&ES-FY16-1519479-4989-SS&ES to reflect approval dates listed in this IP **(Oversight)**	Copy of Correspondence / CNS	Quarterly Update #1

Corresponding Safety Issue	Milestone	Deliverable / Responsible Organization	Expected Completion Date
6.3.4	Revise Hazards Assessment to include new information if applicable and submit for approval. **(RC8)**	Revised Hazards Assessment / CNS	Completed Closure will be provided in Quarterly Update #1
6.3.4	Approve Hazards Assessment **(RC8)**	Approval Letter from NPO / NPO	Quarterly Update #1
6.3.4	Implement through the update and publication of EALs: • Changes from the revision of the Hazards Assessment, if applicable, and • Results of evaluations conducted in the IP. **(RC6, RC7, RC8, CF6)**	Published EALs / CNS	Quarterly Update #4

Verification, Validation, and Reporting			
Activity	**Milestone**	**Deliverable / Responsible Organization**	**Expected Completion Date**
Verification/ Validation of closure	CNS verify and validate any completed milestones through the conduct of the FY16 fourth quarter exercise	AAR / CNS	Quarterly Update #2
Verification/ Validation of closure	CNS verify and validate any completed milestones through the conduct of the FY17 second quarter exercise	AAR / CNS	Quarterly Update # 4
Verification/ Validation of closure	Verify and Validate completed actions for inclusion in Quarterly Report #1	Closure Package / CNS/NNSA	Quarterly Update #1
Verification/ Validation of closure	Verify and Validate completed actions for inclusion in Quarterly Report #2	Closure Package / CNS/NNSA	Quarterly Update #2
Verification/ Validation of closure	Verify and Validate completed actions for inclusion in Quarterly Report #3	Closure Package / CNS/NNSA	Quarterly Update #3
Verification/ Validation of closure	Verify and Validate completed actions for inclusion in Quarterly Report #4	Closure Package / CNS/NNSA	Quarterly Update #4

Verification, Validation, and Reporting			
Activity	**Milestone**	**Deliverable / Responsible Organization**	**Expected Completion Date**
Verification/ Validation of closure	NNSA to coordinate an independent effectiveness review of Pantex Emergency Management Program to include contractor and NPO with a focus on IP actions as an independent verification and validation of effectiveness of all completed actions and programmatic improvements.	EA Report / NPO	Quarterly Update #4
Reporting	Provide Quarterly update #1 to NNSA for distribution to DNFSB	Letter including implementation status and all completed deliverables / CNS/NPO	September 15, 2016
Reporting	Provide Quarterly update #2 to NNSA for distribution to DNFSB	Letter including implementation status and all completed deliverables / CNS/NPO	December 15, 2016
Reporting	Provide Quarterly update #3 to NNSA for distribution to DNFSB	Letter including implementation status and all completed deliverables / CNS/NPO	March 15, 2017
Reporting	Provide Quarterly update #4 to NNSA for distribution to DNFSB	Letter including implementation status and all completed deliverables CNS/NPO	June 15, 2017

8. SUMMARY

Pantex maintains an emergency management program capable of ensuring adequate protection of the public, workers, and the environment. The actions identified in this IP demonstrate DOE's commitment to continuously improving the Pantex drill and exercise program, the off-site notification and communication process, and the emergency decision-making tools. Additionally, CNS will ensure the sustainability and maintenance of the improvement through the commitment to an enterprise program consisting of the sharing and implementation of best practices and mutual support. These actions will improve the overall

effectiveness of the Pantex Emergency Management Program and will address the intent of the DNFSB Recommendation 2015-1 in a measured and prudent fashion.

9. ORGANIZATION AND MANAGEMENT

Overall execution of this IP is the responsibility of the NPO Manager, who is assigned as Responsible Manager. Completion of tasks identified within this IP is the responsibility of the CNS Senior Manager of Emergency Services at the Pantex Plant, CNS Enterprise Emergency Services Director, and the NPO Assistant Manager of Safeguards, Security and Emergency Services. Staff members of the CNS Emergency Management Department and the NNSA Cognizant Field Element will complete the actions identified, support development of technical products, and provide evidence of completion for the items committed to in this IP.

All contractor actions identified will be entered into the CNS Issues Management System, PER/ESTAR, with the associated completion dates. All NNSA actions identified will be entered into the ePegasus System with the associated completion dates. These actions will be monitored for progress. A report including evidence of completion of all actions will be compiled to provide documentation of the disposition of this IP and the associated actions.

As implementation of this plan is carried out, any modifications must be submitted by the Responsible Manager and approved by the Secretary of Energy. All modifications will be presented to the Board for acceptance.

All actions will be verified to be implemented and validated for effectiveness. This process will be conducted in accordance with the CNS Readiness Assurance process, the execution of NPO oversight activities, and the conduct of an independent review.

Quarterly reports will be provided to the Board for the duration of this IP, to include implementation status and deliverables completed. Quarterly report due dates have been developed based on anticipated date of acceptance of this IP by the DNFSB Board. A formal revision to this IP will be requested if the anticipated date of acceptance is not achieved. Deliverable dates associated with milestones listed in table 1.0 will not be affected by date of acceptance of this IP.

10. ROOT CAUSE TREE DIAGRAM

DNFSB Recommendation # 1

Root Cause Tree Diagram for Emergency Preparedness and Response at the Pantex Plant (February 2016)

LEGEND

- Contributing Factor
- Root Cause

DNFSB Concerns with Emergency Preparedness and Response at the Pantex Plant

Inadequate Drill & Exercise Program

Exercise program inadequate to develop and demonstrate proficiency

NPO & Contractor not self-critical assessing Drills/ Exercises thus Limits Programs Effectiveness

Exercise Objectives are inappropriately mapped to performance

Controllers/Evaluators do not always understand response and C/E duties

There is no formal assignment of plant Subject Matter Experts for involvement in the exercise and drill development process (RC 1)

Critical exercise criteria not Identified (CF 2)

Limited Independent Assessment on Objectives (CF 1)

Objectives are not always consistent with anticipated response

Appropriate SME input is only on a volunteer basis and is not formalized

There is no formal assignment of plant Subject Matter Experts for involvement in the exercise and drill development process (RC 1)

Scope of exercises changed during planning process requiring postponement

No or not enough Leadership support in the long range Exercise plan

No Formal Communication of the long and short range plan to stakeholders (RC 2)

Only one Annual Exercise has been conducted to meet hazards identified in EPHA and response elements by Pantex

EMD staff had a limited ability to support exercise development and conduct

The Emergency Management Department (EMD) was inadequately staffed during the Board's review period, in terms of both subject matter expertise and number of staff. (RC 4)

Responders, probability, consequence, and complexity were not included in the 5 Year Exercise Schedule

The exercise schedule does not prioritize probability of event, consequence of event, or complexity of response (CF8)

Pantex does not incorporate all existing plant responders into the ERO qualification program (RC 3)

Drill program inadequate to develop and demonstrate proficiency

All drills conducted at Pantex are not integrated into the EM Drill Program

Because drills are conducted outside of the scope of the ERO response in the EOC

Pantex does not incorporate all existing plant responders into the ERO qualification program (RC 3)

Drills were conducted based on minimum requirements

The Emergency Management Department (EMD) was inadequately staffed during the Board's review period, in terms of both subject matter expertise and number of staff. (RC 4)

There is no formal process for establishment of annual drill schedule consistent with the technical basis (CF 3)

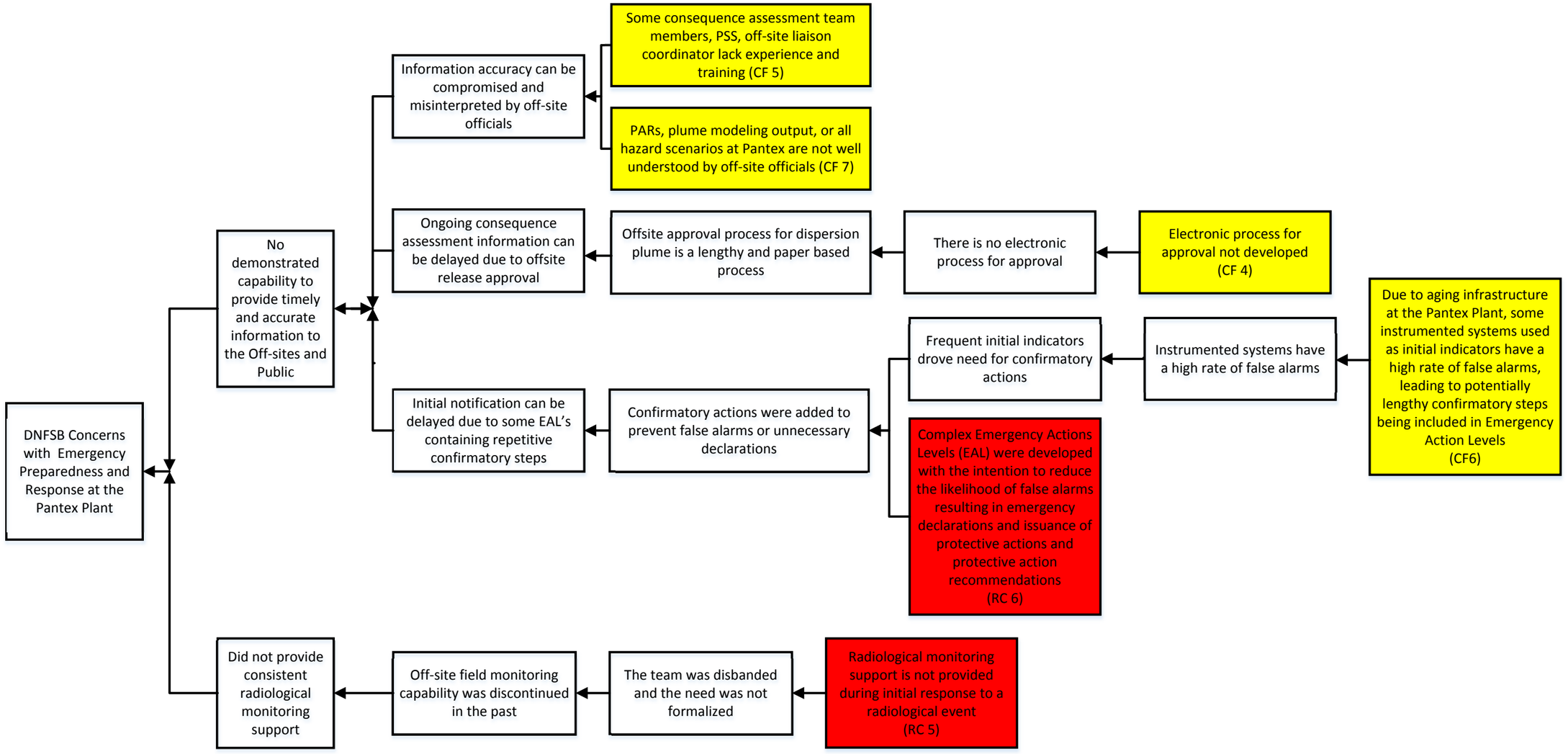
DNFSB Recommendation # 2

Root Cause Tree Diagram for Emergency Preparedness and Response at the Pantex Plant (February 2016)

LEGEND

- Contributing Factor

- Root Cause



DNFSB Recommendation # 3

Root Cause Tree Diagram for Emergency Preparedness and Response at the Pantex Plant (February 2016)

LEGEND

- Contributing Factor

- Root Cause