



**UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION I
2100 RENAISSANCE BLVD.
KING OF PRUSSIA, PA 19406-2713**

July 11, 2017

EA-17-047

Mr. Bryan Hanson
Senior Vice President, Exelon Generation, LLC
President and Chief Nuclear Officer, Exelon Nuclear
4300 Winfield Rd.
Warrenville, IL 60555

**SUBJECT: NRC INVESTIGATION REPORT NO. 1-2016-008 AND
THREE MILE ISLAND, UNIT 1 - INSPECTION REPORT 05000289/2017008**

Dear Mr. Hanson:

This letter refers to an investigation conducted by the U.S. Nuclear Regulatory Commission (NRC) Office of Investigations (OI) at your Three Mile Island Nuclear Station, Unit 1 (TMI). The investigation, which was completed on January 23, 2017, was conducted to determine whether a Chicago, Bridge, and Iron (CB&I) supervisor, while working at TMI, deliberately introduced and stored prohibited material in the TMI Unit 1 reactor building and falsified a related record. Based on the evidence gathered during the OI investigation, the NRC did not substantiate that the CB&I supervisor engaged in deliberate misconduct. However, two violations were identified.

Therefore, the NRC is documenting two findings of very low safety significance (Green), one which is licensee-identified, in this report. Both of these findings involved violations of NRC requirements and are being treated as a non-cited violations (NCV) consistent with Section 2.3.2.a of the Enforcement Policy.

You are not required to respond to this letter. However, if you contest the violations or the significance of these NCVs, you should provide a response within 30 days of the date of this inspection report, with the basis for your denial, to the Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC 20555-0001; with copies to the Regional Administrator, Region I; the Director, Office of Enforcement; and the NRC Resident Inspectors at Three Mile Island.

In addition, if you disagree with the cross-cutting aspect assigned in this report, you should provide a response within 30 days of the date of this inspection report, with the basis for your disagreement, to the U. S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, DC, 20555-0001; with copies to the Regional Administrator, Region I, and the NRC Resident Inspectors at Three Mile Island.

This letter, its enclosure, and your response (if any) will be made available for public inspection and copying at <http://www.nrc.gov/reading-rm/adams.html> and at the NRC Public Document Room in accordance with 10 CFR 2.390, "Public Inspections, Exemptions, Requests for Withholding."

Please note that final NRC investigation documents, such as the OI report described above, may be made available to the public under the Freedom of Information Act (FOIA), subject to redaction of information appropriate under the FOIA. Requests under the FOIA should be made in accordance with 10 CFR 9.23, "Requests for Records." Additional information is available on the NRC website at <http://www.nrc.gov/reading-rm/foia/foia-privacy.html>.

Should you have any questions regarding this letter, please contact Mr. Silas Kennedy at 610-337-5046.

Sincerely,

A handwritten signature in black ink, appearing to read 'SK', with a long horizontal stroke extending to the right.

Silas R. Kennedy, Chief
Division of Reactor Projects

Docket No. 50-289
License No. DPR-50

cc: Distribution via ListServ

SUMMARY

IR 05000289/2017008, 10/28/2015-01/23/2017; Three Mile Island, Unit 1, Problem Identification and Resolution

This report covers the period of time preceding the TMI 21st maintenance and refueling outage (T1R21) and subsequent inspection by resident inspectors of identified issues during T1R21 outage preparation. Inspectors identified one finding of very low safety significance (Green), which was a non-cited violation (NCV). The significance of most findings is indicated by their color (i.e., greater than Green, or Green, White, Yellow, Red) and determined using Inspection Manual Chapter (IMC) 0609, "Significance Determination Process" (SDP), dated November 15, 2016. Cross-cutting aspects are determined using IMC 0310, "Aspects Within Cross-Cutting Areas," dated December 4, 2014. All violations of NRC requirements are dispositioned in accordance with the NRC's Enforcement Policy, dated November 1, 2016. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 6.

Cornerstone: Mitigating Systems

- Green. The inspectors identified a finding of very low safety significance involving a non-cited violation (NCV) of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action Program," because Exelon did not effectively correct a condition adverse to quality regarding the implementation of controls for pre-staging of materials in the reactor building. Specifically, Exelon did not effectively implement corrective actions regarding the control of pre-staging materials in the reactor building during power operations, which resulted in unsecured prohibited material in a location that had the potential, during a large break loss of coolant accident (LOCA), to be transported to and impact the emergency core cooling system (ECCS) sump. Exelon documented this finding in issue reports 2608560 and 2578255. Corrective actions include Exelon to establish a focus team, led by the maintenance manager, to ensure pre-outage loading of the reactor building is conducted in accordance with requirements and directly supervised by Exelon personnel.

The performance deficiency is more than minor because, if left uncorrected, it has the potential to lead to a more significant safety concern. Specifically, without proper controls implemented, materials may be pre-staged in the reactor building in a quantity or configuration that may render the ECCS sump inoperable. The inspectors evaluated the finding against the Mitigating System Cornerstone using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, and determined this finding to be of very low safety significance (Green).

The finding has a cross-cutting aspect in the area of Human Performance, Field Presence, because Exelon senior managers did not ensure the oversight of work activities by supplemental personnel [H.2]. (Section 4OA2)

Other Findings

A violation of very low safety significance that was identified by Exelon was reviewed by the inspectors. Corrective actions taken or planned by Exelon have been entered into Exelon's corrective action program. This violation and corrective action tracking number are listed in Section 4OA7 of this report.

REPORT DETAILS

4. OTHER ACTIVITIES

4OA2 Problem Identification and Resolution (71152)

Routine Review of Problem Identification and Resolution Activities

a. Inspection Scope

As required by Inspection Procedure 71152, "Problem Identification and Resolution," the inspectors routinely reviewed issues during baseline inspection activities and plant status reviews to verify that Exelon entered issues into the corrective action program (CAP) at an appropriate threshold, gave adequate attention to timely corrective actions, and identified and addressed adverse trends. In order to assist with the identification of repetitive equipment failures and specific human performance issues for follow-up, the inspectors performed a daily screening of items entered into the CAP and periodically attended issue report screening and management review meetings. On October 28, 2015, inspectors reviewed an issue report (2578255) regarding non-compliant pre-staging of outage materials into the reactor building. Inspectors also reviewed the subsequent apparent cause report (ACE 2578255) and attended the December 15, 2015 management review committee meeting where CB&I contract management presented their conclusions to Exelon. Inspectors interviewed Exelon and CB&I staff. The inspectors performed walkdowns of the reactor building where pre-staging of material occurred. Documents reviewed are listed in the Attachment.

b. Findings

Introduction. The inspectors identified a finding of very low safety significance (Green) involving an NCV of 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action Program," because Exelon did not effectively correct a condition adverse to quality regarding the implementation of controls for pre-staging of materials in the reactor building. Specifically, Exelon did not effectively implement corrective actions regarding the control of pre-staging materials in the reactor building during power operations, which resulted in unsecured prohibited material in a location that had the potential, during a large break LOCA, to be transported to and impact the ECCS sump.

Description. On October 28, 2015, Exelon performed a reactor building loading walkdown to review the equipment staged for the upcoming outage. During the walkdown, Exelon noted that several items staged in the reactor building were not in accordance with TMI Procedure AP 1015, "Equipment Storage Inside Class 1 Buildings". Items inappropriately stored included loose plastic, light stands, light bulbs, Knaack locker box, and bolt cutters. Exelon immediately removed the prohibited items from the reactor building and documented the condition in issue report (IR) 2575255. The IR identified the condition as a violation of Technical Specification 6.8.1, "Procedures and Programs," which is documented in section 4OA7 of this report.

The inspectors identified that this violation was similar to NCV 05000289/2013005-01, Improper Storage of Material in Reactor Building (ADAMS Accession No. ML14041A047) and similar occurrences documented at TMI for the past two outages (IRs 1577100 and 1279816). In addition, a root cause evaluation (RCE 0388006) from a 2005 event, where supplemental personnel were conducting reactor building pre-staging unsupervised, had enacted a corrective action to prevent recurrence (CAPR 0388006-

24) to require direct oversight of reactor building loading by station personnel. This requirement currently manifests itself in three recurring work orders (R2233355-06, -07, -08) for Operations, Engineering, and Maintenance groups to provide portions of reactor building pre-staging oversight. It was determined that each work order was canceled without coordinating if any group was providing direct supervision. Hence, none of these groups performed pre-outage loading oversight of the reactor building performed by supplemental personnel. Therefore, the requirements established in 2005 for direct oversight as well as the corrective actions in 2011 (IR 1279816) and 2013 (IR 1577100) to reinforce those requirements were not properly implemented or effective.

Exelon entered this issue into their CAP as IRs 2608560 and 2578255. Planned corrective actions included Exelon establishing a focus team, led by the maintenance manager, to ensure pre-outage loading of the reactor building is conducted in accordance with requirements and directly supervised by Exelon personnel.

Analysis. The inspectors determined that Exelon's failure to effectively correct a condition adverse to quality regarding the implementation of controls for pre-staging of materials in the reactor building was reasonably within Exelon's ability to foresee and correct. Specifically, Exelon did not effectively implement corrective actions regarding the control of pre-staging materials in the reactor building during power operations, which resulted in unsecured prohibited material in a location that had the potential, during a LOCA, to be transported to and impact the ECCS sump.

The performance deficiency is more than minor because, if left uncorrected, it has the potential to lead to a more significant safety concern. Specifically, without proper controls implemented, materials may be pre-staged in the reactor building in a quantity or configuration that may render the ECCS sump inoperable. The inspectors evaluated the finding against the Mitigating System Cornerstone using Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, and determined this finding to be of very low safety significance (Green) because the degraded condition was not a design deficiency that affected system operability; did not represent an actual loss of function of a system; did not represent an actual loss of function of a single train or two separate trains for greater than its TS allowed outage time and did not represent an actual loss of function of one or more non-TS trains of equipment designated as high safety significant. The finding has a cross-cutting aspect in the area of Human Performance, Field Presence, because Exelon senior managers did not ensure the oversight of work activities by supplemental personnel [H.2].

Enforcement. 10 CFR 50, Appendix B, Criterion XVI, "Corrective Action," requires in part that measures be established to assure that conditions adverse to quality are effectively corrected. Contrary to the above, from October 2013 through October 2015, the measures established by Exelon's CAP did not assure that the condition adverse to quality regarding the implementation of controls for pre-staging of materials in the reactor building was adequately corrected. Specifically, Exelon did not effectively implement corrective actions regarding the control of pre-staging materials in the reactor building during power operations, which resulted in unsecured prohibited material in a location that had the potential, during a LOCA, to be transported to and impact the ECCS sump. Exelon captured this issue in their CAP as IRs 2608560 and 2578255. Planned corrective actions include Exelon to establishing a focus team, led by the maintenance manager, to ensure pre-outage loading of the reactor building is conducted in accordance with requirements and directly supervised by Exelon personnel. Since this deficiency was considered of very low safety significance (Green), and was entered

into the CAP for resolution, this violation is being treated as an NCV, consistent with the NRC Enforcement Policy. (**NCV 05000289/2017008-01, Failure to Correct Deficiency in Implementing Controls for Pre-Staging of Material in the Reactor Building**)

4OA6 Meetings, Including Exit

On July 7, 2017, inspectors presented the inspection results to Mr. T. Haaf, Plant Manager, and other members of the TMI staff. The inspectors verified that no proprietary information was retained by the inspectors or documented in this report.

4OA7 Licensee-Identified Violations

The following licensee-identified violation of NRC requirements was determined to be of very low safety significance and meets the NRC Enforcement Policy criteria for being dispositioned as a Non-Cited Violation.

Technical Specifications 6.8., "Procedures and Programs," requires, in part, that written procedures be established, implemented, and maintained covering the applicable procedures recommended in Appendix 'A' of Regulatory Guide 1.33, Revision 2, 1978.

Regulatory Guide 1.33, Revision 2, "Quality Assurance Program Requirements," Appendix A, requires administrative procedures for access to containment.

Exelon Administrative Procedure 1015, Revision 7, "Equipment Storage Inside Class I Building," requires that no equipment shall be stored, placed, or staged inside a Class I Building without an approved Equipment Storage Data Sheet (ESDS). It further states, in part, that within the reactor building materials such as plastic sheeting must be fastened/secured in such a way as to prevent them from being washed into the reactor building sump post-LOCA.

Contrary to the above, between October 27, 2015, and October 28, 2015, Exelon did not properly implement a procedure related to the staging of equipment in preparation for a Three Mile Island, Unit 1 refueling outage. Specifically, on October 28, 2015, Exelon performed a reactor building loading walkdown to review the equipment staged for the upcoming outage. During the walkdown, Exelon noted that several items staged in the reactor building were not in accordance with TMI Procedure AP 1015. Items inappropriately stored included loose plastic, light stands, light bulbs, a Knaack locker box, and bolt cutters. Exelon immediately removed the prohibited items from the reactor building and documented the condition in IR 2575255.

The finding is more than minor because it was associated with the availability and reliability attribute of the Mitigating Systems cornerstone and affected the cornerstone objective to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences. Specifically, the loose plastic had the potential to adversely impact the ECCS by compromising the recirculation suction flow path due to blockage of the suction strainer. The inspectors evaluated the finding using Inspection Manual Chapter 0609, Attachment 4, "Initial Characterization of Findings," and Appendix A, "The Significance Determination Process for Findings At-Power," Exhibit 2, and determined this finding screened as very low safety significance (Green) because, based on inspector review of a technical debris evaluation (ACIT

2578255-08) by Exelon, the finding did not represent an actual loss of function of a system.

ATTACHMENT: SUPPLEMENTARY INFORMATION

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee Personnel

E. Callan	Site Vice President
T. Haaf	Plant Manager
T. Arnold	Regulatory Assurance, CAP Manager
D. Atherholt	Manager, Regulatory Assurance (prior)
P. Bennett	Senior Manager, Systems Engineering
D. Divittore	Manager, Radiological Engineering
M. Fitzwater	Senior Regulatory Assurance Engineer
J. Goldman	Manager, Regulatory Assurance (current)
C. Keane	Engineer 2
J. Piazza	Senior Manager, Design Engineering
G. Smith	Director, Maintenance
M. Torborg	TMI Programs Engineering Manager

Other Personnel

E. Frederick	Supervisor, Chicago Bridge & Iron
R. Minnik	Site Manager, Chicago Bridge & Iron

LIST OF ITEMS OPENED AND CLOSED

Opened/Closed

05000289/2017008-01	NCV	Failure to Correct Deficiency in Implementing Controls for Pre-Staging Material in the Reactor Building (4OA2)
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LIST OF DOCUMENTS REVIEWED

Section 4OA2: Problem Identification and Resolution and Section 4OA7: Licensee-Identified Violations

Procedures

AP-1015, Equipment Storage Inside Class I Building, Revision 7
MA-TM-460-001, Planned Containment Entry – TMI 1, Revision 2
PI-AA-120, Issue Identification and Screening Process, Revision 1
PI-AA-125, Corrective Action Program (CAP) Procedure, Revision 2

Drawings

1E-153-02-002, Reactor Building Elevation 308 foot, Revision 6

Miscellaneous

ACIT 2578255-08, Reactor Building Debris Evaluation, dated November 5, 2015
Apparent Cause Investigation Report, RB T1R21 Pre-Staging Not In Compliance with ESDS Requirements (Issue Report 2578255), dated December 10, 2015
Management Review Committee Package, dated December 15, 2015

Pre-Load ESDS 2011-08

Technical Data Sheet, Griffolyn Type 55 FR

Technical Evaluation 1543836-02, Temporary Storage of Aluminum-bearing Zinc-bearing items,
and items with Unqualified Coatings in the TMI-1 Reactor building at Power

Work Order A2347103, Reactor Building Pre-Outage Staging of Materials, dated October 28,
2015

Issue Reports: 3948499 2608560 388006 2578255 2607357

LIST OF ACRONYMS

ACE	apparent cause evaluation
ADAMS	Agencywide Documents Access and Management System
CAP	corrective action program
CFR	Code of Federal Regulations
ECCS	emergency core cooling system
IMC	Inspection Manual Chapter
LCO	limiting condition of operation
LOCA	loss of coolant accident
NCV	non-cited violation
NRC	Nuclear Regulatory Commission
RB	reactor building
SSC	structure, system, and component
TMI	Three Mile Island Unit 1
TS	technical specifications
UFSAR	updated final safety analysis report
WO	work order