

January 15, 2016

MEMORANDUM TO: Dan Dorman, Regional Administrator, Region I
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FROM: Patricia K. Holahan, Director */RA/*
Office of Enforcement

SUBJECT: ENFORCEMENT GUIDANCE MEMORANDUM 11-003,
REVISION 3, DISPOSITIONING BOILING WATER REACTOR
LICENSEE NONCOMPLIANCE WITH TECHNICAL
SPECIFICATION CONTAINMENT REQUIREMENTS DURING
OPERATIONS WITH A POTENTIAL FOR DRAINING THE
REACTOR VESSEL

PURPOSE:

This enforcement guidance memorandum (EGM) provides direction on how to disposition boiling water reactor (BWR) licensee noncompliance with technical specification (TS) containment requirements during operations with a potential for draining the reactor vessel (OPDRV). It includes immediate actions criteria for OPDRV activities, and specifies a draindown time that will allow most routine activities to take place. This EGM further clarifies the U.S. Nuclear Regulatory Commission (NRC) staff's intent to ensure that water level monitoring detects a draining event with sufficient time to meet containment closure criteria during OPDRV activities, thereby providing a continuing reasonable assurance of safe operations during OPDRV activities.

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Revision 3 of this EGM contains editorial clarifications that are consistent with the original EGM guidance and extends the time period of enforcement discretion to December 31, 2017, or until 12 months after NRC staff approval of a generic solution, whichever occurs first. This permits licensee refueling outage planning while the NRC staff and the Boiling Water Reactor Owners Group (BWROG) finalize a generic solution for TS changes.

The generic solution for TS changes is intended to ensure that Safety Limit 2.1.1.3, "Reactor vessel water level shall be greater than the top of active irradiated fuel," will be met by focusing on the prevention of a draining event that challenges water inventory control while still providing mitigating strategies.

BACKGROUND:

Certain safety systems must be operable during OPDRV activities to mitigate draindown events, and to provide protection against untreated fission product release in the event that the reactor pressure vessel (RPV) water level drops and uncovers irradiated fuel. BWR licensee TS do not define the term OPDRV or identify specific plant actions that constitute OPDRV activities. Because a definition is not provided, the NRC staff expects BWR licensees to use the plain language meaning of OPDRV for determining applicable TS requirements. This means that any activity that could potentially result in draining or siphoning the RPV water level below the top of active fuel (TAF), without taking credit for mitigating measures, would be an OPDRV activity.

On April 3, 2010, the NRC issued a non-cited violation to Exelon Generation Co., LLC, Clinton Power Station, for making procedure changes that interpreted the term OPDRV, a violation of 10 CFR 50.59, "Changes, Tests and Experiments," (NRC Integrated Inspection Report 05000461/2010-003). Specifically, based on these procedure changes, the licensee conducted activities previously considered OPDRV activities without having to comply with OPDRV TS requirements. Since April 2010, the NRC staff learned that other BWR licensees made similar changes to their plant procedures to interpret the plain language meaning of OPDRV in a way that restricts the applicability of OPDRV TS requirements, or uses compensatory measures to avoid having to comply with the TS requirements.

The changes were made by the licensees to make maintenance operations more efficient and timely, resulting in reduced plant outage time. For example, BWR licensees selected a minimum size for an opening in the RPV located below the top of the fuel in order for a maintenance operation to qualify as an OPDRV activity. The selected hole size is large enough to allow the licensee to conduct under vessel work, such as control rod drive replacement, without having secondary containment¹, standby gas treatment, or an emergency core cooling system operable as required by TS. Licensees typically include a requirement in their procedures to conduct these activities with the reactor cavity flooded, have inventory replacement capability, and include physical barriers as compensatory measures in order to conclude that such activities would not have the potential to drain the reactor vessel. However, TS do not allow for the application of compensatory measures as a means of avoiding entry into TS limiting conditions for operation (LCO).

¹The majority of licensed BWR containment designs are secondary containment shutdown plants; therefore, the criteria and discussion below is written for this plant design by referring to "secondary containment." For the other BWR containment designs, "secondary containment" is understood to mean "primary containment" for a primary containment shutdown plant and "primary and secondary containment" for a primary and secondary containment shutdown plant.

On July 27, 2011, the NRC staff and the BWROG held a public meeting in Rockville, MD (Agencywide Documents Access and Management System (ADAMS) Accession Number ML112220018) to discuss OPDRV TS requirements. The purpose of the meeting was to gain a common understanding of what constitutes an OPDRV activity, and to consider whether the NRC staff needs to develop additional guidance (e.g., an improvement to the Standard Technical Specifications (STS)) to provide more clarity to the term. At the meeting, the BWROG presented the industry position that any operation that licensees can mitigate before uncovering irradiated fuel should not be considered an OPDRV activity. The NRC staff iterated that the plain language meaning of OPDRV activities applies. The NRC staff considers OPDRV activities to be any activity that could result in the draining or siphoning of the RPV water level below the TAF, without crediting the use of mitigating measures to prevent the uncovering of fuel.

The July 27, 2011, public meeting also resulted in the NRC staff decision to issue EGM 11-003, Revision 0, on October 20, 2011 (ADAMS Accession Number ML11251A230). The initial purpose of the EGM was to allow licensees who had already planned their outage OPDRV activities without establishing secondary containment to proceed with their plans. The actions detailed in the EGM provided an equivalent or greater level of safety than the current TS requirements for conducting OPDRV activities. The original expiration date for the EGM was December 31, 2013.

In preparation for further public meetings with the BWROG, the NRC staff performed a review of past licensing positions as well as staff interactions with the industry related to OPDRV practices. The review showed variability in NRC staff actions and communications resulting in inconsistent implementation of the plain language meaning of OPDRV. Accordingly, the NRC staff initiated an improvement to STS for BWR licensees to allow a graded approach to OPDRV requirements.

On December 20, 2012, the NRC staff approved EGM 11-003, Revision 1 (ADAMS Accession Number ML12263A173), which added clarifying language for the immediate actions criteria as a result of further NRC staff analysis of the OPDRV issue and NRC staff interactions with the BWROG. EGM 11-003, Revision 1 expired on December 31, 2013.

On February 13, 2013, the NRC staff and the BWROG held a pre-submittal meeting during which the BWROG provided Technical Specifications Task Force (TSTF) Traveler TSTF-542, Revision 0 (draft), "Reactor Pressure Vessel Level Water Inventory Control." TSTF-542 proposed changes to remove the existing STS requirements related to OPDRVs, and to add new requirements to control RPV water inventory. Due to the complex nature of the proposed STS change, the NRC staff made several official comments on the draft TSTF. Among others, the comments included that TSTF-542 should incorporate the immediate action criteria in this EGM as elements of a TS 5.5 program, required by a RPV Water Inventory Control LCO. Additionally, the NRC staff commented that the RPV Water Inventory Control LCO should distinguish between Mode 4 and Mode 5 operations. In Mode 4, the RPV inventory could quickly drain to the TAF because the head is on with reactor water level in the normal band. However, in Mode 5 the reactor cavity water inventory is available before the drain down to the TAF is reached. The BWROG received the NRC staff's comments on TSTF-542, Revision 0 (draft), and continued to work with the NRC staff to develop an appropriate generic solution.

On September 24, 2013, the NRC staff and the BWROG held a third and final pre-submittal meeting during which the BWROG presented an updated TSTF-542, Revision 0 (draft). The NRC staff agreed that the updated TSTF made significant progress toward addressing previous NRC staff concerns with the new TS limits for RPV water inventory control. Although the NRC staff had additional comments on the updated TSTF, the BWROG and the NRC staff agreed that submittal of TSTF-542, Revision 0, to the staff for review by December 31, 2013, was achievable.

TSTF-542 was not available as a TS consolidated line item improvement for use by licensees planning to enter a refueling outage after the expiration of EGM 11-003, Revision 1. On December 13, 2013, after reconsidering available regulatory options and reviewing industry operating experience, the NRC staff issued Revision 2 of EGM 11-003 (ADAMS Accession Number ML13177A128). Revision 2 extended the time period for enforcement discretion to December 31, 2015. This decision ensured continued safe operation of the plants and permitted licensee refueling outage planning while the NRC staff and BWROG finalize the generic solution for TS.

The BWROG formally submitted Revision 0 of TSTF-542 for NRC staff review on December 31, 2013 (ADAMS Accession No. ML14002A112). The NRC staff began its review of the submittal and found that additional information was required to complete its review. The NRC staff issued a Request for Additional Information (RAI) on October 10, 2014 (ADAMS Accession No. ML14279A271). The RAI was complex and required extensive industry efforts to provide a response. The BWROG submitted its response to the NRC staff's RAI as well as TSTF-542, Revision 1 in a letter dated September 15, 2015 (ADAMS Accession No. ML15258A850). The NRC staff reviewed the BWROG response and identified areas requiring additional information. On November 5, 2015, the NRC staff held a meeting with industry representatives to discuss the NRC staff's second RAI. The industry's formal response to the NRC staff's second RAI is expected February 29, 2016. The NRC staff anticipates the need for substantial agency resources for the associated technical review of the industry's response, and currently forecasts approval of Traveler TSTF-542 in late summer 2016.

The unanticipated delays in the issuance of TSTF-542 create the need to once again extend the time period for enforcement discretion approved through EGM 11-003, Revision 2. The NRC staff needs additional time to finalize the generic solution. The additional time will also allow BWR licensees adequate time to prepare and submit a License Amendment Request (LAR) to adopt the generic solution once approved. Therefore, this Revision 3 of EGM 11-003 extends the period of enforcement discretion through December 31, 2017, or until 12 months after staff approval of TSTF-542, whichever occurs first. Further BWR fleet-wide time period extensions of this enforcement discretion will not be considered without prior consultation with, and affirmative consent of, the Commission.

Basis for Granting Enforcement Discretion

The NRC staff will exercise enforcement discretion as set forth in this EGM to improve regulatory clarity in the interim for BWR plants, and to allow implementation of specific interim actions as an alternative to full compliance with plant TS while the generic solution is under development.

The NRC staff intends to use the enforcement discretion described in this EGM, integrated with the license amendment process, to resolve TS compliance issues created by the lack of clear regulatory guidance on the meaning of OPDRV and the inconsistent licensee implementation of the plain language meaning of the term OPDRV.

The NRC considers enforcement discretion related to secondary containment operability during Mode 5 OPDRV activities appropriate because the associated interim actions necessary to receive the enforcement discretion ensure an adequate level of safety by requiring licensees' immediate actions to: (1) adhere to the NRC plain language meaning of OPDRV activities, (2) meet the requirements that specify the minimum makeup flow rate and water inventory based on OPDRV activities with long drain down times, (3) ensure that adequate defense in depth is maintained to minimize the potential for the release of fission products with secondary containment not operable by (a) monitoring RPV level to identify the onset of a loss of inventory event, (b) maintaining the capability to isolate the potential leakage paths, (c) prohibiting Mode 4 (cold shutdown) OPDRV activities, and (d) prohibiting movement of irradiated fuel with the spent fuel storage pool gates removed in Mode 5, and (4) ensure that licensees follow all other Mode 5 TS requirements for OPDRV activities. During the time period of enforcement discretion, the staff will work with the BWROG to develop an improvement to the STS that licensees will be able to adopt through the NRC license amendment process.

To be eligible for this enforcement discretion, licensees must meet the minimum criteria established in this EGM as described below. In addition, each licensee that receives the enforcement discretion must submit a LAR to resolve the issue for its plant that the NRC staff finds acceptable in accordance with LIC-109, "Acceptance Review Procedures." The generic solution will be a change to the STS, and the NRC will issue a letter to the TSTF signifying final approval of the TSTF generic solution. Each licensee that receives enforcement discretion must submit a LAR within 12 months of the NRC staff's approval letter to the TSTF, or the licensee will be issued a TS violation. Licensees may submit a LAR to either adopt the NRC-approved approach or to propose an alternative approach for their plants.

ACTIONS:

Immediate Actions

In accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy, the agency will exercise enforcement discretion and will not cite licensees for TS violations related to the conduct of OPDRV activities with the secondary containment inoperable. Enforcement discretion will only be granted for outages occurring through December 31, 2017, or until 12 months after staff approval of a generic solution, whichever occurs first. Enforcement discretion is appropriate because the issue has low safety significance since licensees must implement compensatory measures to provide an adequate level of safety when using the discretion provided herein. The NRC will exercise enforcement discretion only if the licensee demonstrates that it has met the following criteria during an OPDRV activity:

1. The licensee shall consider any activity that could potentially result in draining or siphoning the RPV water level below the TAF, including operations involving aligning and realigning plant systems prior to achieving steady-state water level control, without taking credit for mitigating measures, to be an OPDRV activity. The addition and

removal of small volumes of water inventory from the RPV, for example control rod drive cooling water, is considered steady-state water level control and not an OPDRV provided that the instrumentation and valves for automatic isolation of the drain down path remain available. The licensee shall declare (log) that they are in an OPDRV and document the actions being taken to ensure water inventory is maintained, and defense-in-depth criteria are in place, prior to entering the OPDRV activity.

2. The licensee shall meet the following requirements, which specify the minimum makeup flow rate and water inventory:
 - a) During OPDRV activities the water level shall be equal to or greater than [23]² feet (RHR – High Water Level) over the top of the RPV flange and the gate to the spent fuel storage pool and to the upper containment cavity to dryer pool (as applicable) shall be removed.
 - b) During OPDRV activities, at least one safety-related pump shall be available (preferably aligned to the division with the required operable EDG), and it shall be aligned to a makeup water source with the capability to inject water equal to, or greater than, the maximum potential leakage rate from the RPV for a minimum time period of four hours. If at any time the water inventory requirement is not met or inventory makeup capability is lost, then actions shall be initiated to immediately suspend OPDRV activities.
 - c) During OPDRV activities, the time to drain down the water inventory from the RHR - High Water Level to the top of the RPV flange shall be greater than 24 hours based on the calculated maximum leak rate for OPDRV activities.
3. OPDRV activities shall be performed, to the maximum extent practicable, in a manner that maintains defense in depth against the release of fission product inventory. The following limitations shall apply:
 - a) OPDRV activities are prohibited during Mode 4 with secondary containment inoperable.
 - b) During OPDRV activities movement of [recently]³ irradiated fuel is prohibited with the spent fuel storage pool gates removed in Mode 5.
 - c) The capability to isolate the potential leakage path during OPDRV activities before the water inventory reaches the RPV flange shall be maintained.
 - d) At least two independent means of monitoring the RPV water level shall be available for identifying the onset of loss of inventory events during an OPDRV

² Use the plant-specific TS allowable value for RHR – High Water Level (23 feet is a typical value).

³ The bracketed term [recently] applies to licensees that have adopted the Alternative Source Term (10 CFR 50.67) and is bracketed here to maintain the convention applied in standard technical specifications (STS) to show that a plant-specific licensing basis determines the use of the bracketed STS language. Technical specifications under 10 CFR 50.67 require secondary containment to be operable during movement of “recently irradiated fuel assemblies”.

activity; at least one of these shall be an alarming indicator in the control room. One of the two indications may be by direct observation of the RPV water level, provided that such observation is continuous and the observer is in direct contact with the control room via a connection that does not require AC power. It is not necessary to modify existing instrumentation to provide the required indication (e.g., recalibration to cold-shutdown conditions). The RPV water level monitoring capability shall ensure that a draining event is detected with sufficient time to meet 3.e below.

- e) The RPV water level monitoring capability shall ensure that a draining event is detected with sufficient time to: (1) close at least one secondary containment access door in each access opening before water reaches the top of the RPV flange, and (2) close secondary containment equipment hatches before water reaches the top of the RPV flange.
4. Licensees must follow all other TS Applicability and Action requirements for Mode 4 and Mode 5 OPDRV activities. If a licensee has a TS requirement that is more restrictive or conservative than the criteria stated herein, it must follow its TS.
- a) Violations of other requirements (e.g., 10 CFR 50.59 and Criterion III, "Design Control," or Criterion V, "Instructions, Procedures, and Drawings," of Appendix B, "Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants," to 10 CFR Part 50, "Domestic Licensing of Production and Utilization Facilities") that may have contributed to the above TS violation may be considered for enforcement discretion under this EGM on a case-by-case basis. Regions should consult with the Office of Enforcement in those instances.
 - b) Violations associated with this EGM do not require discussion at an enforcement panel. They do require, however, the assignment of an enforcement action tracking number, and they shall be documented in an inspection report. The cover letter to the inspection report that discusses the violation should include the following or similar language:

A violation of technical specifications [insert the applicable TS number] was identified. Because the violation was identified during the discretion period described in Enforcement Guidance Memorandum 11-003, Revision 3, the NRC is exercising enforcement discretion in accordance with Section 3.5, "Violations Involving Special Circumstances," of the NRC Enforcement Policy and, therefore, will not issue enforcement action for this violation, subject to a timely license amendment request being submitted.

Long-Term Actions

1. The BWR Owners Group submitted a proposed TSTF Traveler that revises BWR/4 and BWR/6 OPDRV STS requirements for NRC staff review. The draft STS change currently being considered would replace the existing TS requirements related to OPDRVs with a new requirement to manage RPV Water Inventory Control. The proposed TS changes would require a determination of the minimum time required to

drain the RPV water level to the TAF if an unintended draining event were to occur. Compensatory measures are specified in the TSTF to provide reasonable assurance of safe operation through increased requirements as the drain time is shortened. The STS change to incorporate these new requirements will include model LARs and model no significant hazards consideration determinations, and a commitment for timely processing of license amendments by the NRC staff.

- 2 As iterated in the immediate actions, enforcement discretion will only be granted for outages occurring through December 31, 2017, or until 12 months after staff approval of a generic solution, whichever occurs first. To continue receiving this enforcement discretion, affected BWR licensees shall submit, within 12 months after NRC approval of the generic solution, a LAR that the staff accepts for review. The NRC will consider extending the 12-month period for a specific licensee to submit a LAR on a case-by-case basis with adequate justification from the licensee. This enforcement discretion will continue to be in place until the NRC dispositions a licensee's LAR. Further BWR fleet-wide time period extensions of this enforcement discretion will not be considered without prior consultation with, and affirmative consent of, the Commission.

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drain the RPV water level to the TAF if an unintended draining event were to occur. Compensatory measures are specified in the TSTF to provide reasonable assurance of safe operation through increased requirements as the drain time is shortened. The STS change to incorporate these new requirements will include model LARs and model no significant hazards consideration determinations, and a commitment for timely processing of license amendments by the NRC staff.

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