



UNITED STATES
NUCLEAR REGULATORY COMMISSION
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EGM 22-001

April 15, 2022

MEMORANDUM TO: David C. Lew, Regional Administrator, Region I
Laura Dudes, Regional Administrator, Region II
John B. Giessner, Regional Administrator, Region III
Scott Morris, Regional Administrator, Region IV
John Lubinski, Director, Office of Nuclear Material Safety
and Safeguards

FROM: Mark Lombard, Director
Office of Enforcement

SUBJECT: ENFORCEMENT GUIDANCE MEMORANDUM 22-001,
ENFORCEMENT DISCRETION FOR NONCOMPLIANCE OF
TORNADO HAZARDS PROTECTION REQUIREMENTS AT
INDEPENDENT SPENT FUEL STORAGE INSTALLATIONS

PURPOSE:

This enforcement guidance memorandum (EGM) provides guidance to U.S. Nuclear Regulatory Commission (NRC) staff on the exercise of enforcement discretion when a specific or general license (licensee) of an independent spent fuel storage installation (ISFSI) does not comply with its design or licensing basis for protection against environmental conditions and natural phenomena as required by Title 10 of the *Code of Federal Regulations* (10 CFR) Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste." Specifically, this EGM provides guidance to the NRC staff to exercise enforcement discretion for violations of 10 CFR 72.122(b), "Protection against environmental conditions and natural phenomena," 10 CFR 72.212, "Conditions of general license issued under 10 CFR 72.210," and/or 10 CFR 72.48, "Changes, tests and experiments" during ISFSI handling operations¹ when certain conditions are met by the licensee.

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¹ For the purposes of this EGM, "ISFSI handling operations" means all activities associated with the lifting, placement, and movement of spent fuel storage canisters, casks, or other structures, systems, and components important to safety.

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BACKGROUND:

During NRC inspections, the NRC has identified that some ISFSI licensees had not performed the necessary evaluations to demonstrate that their site-specific parameters with respect to severe weather events, including tornadoes, are enveloped by the design bases of the spent fuel storage cask system. These cases have been documented in inspection reports as a violation and/or unresolved items. Further, certain ISFSI licensees have inappropriately used the 10 CFR 72.48 process to implement administrative controls without submitting a license amendment request for prior NRC approval. Because the implementation of administrative controls would not meet the criteria for changes under 10 CFR 72.48(c), these changes should have been submitted to NRC for a license amendment request in accordance with 10 CFR 72.56, "Application for amendment of license" (specific license) or requested the certificate holder for a spent fuel storage cask design to submit a request under 10 CFR 72.244, "Application for amendment of a Certificate of Compliance" (general license).

Upon the development of dry spent fuel storage technologies, the NRC promulgated regulatory requirements for ISFSI designs to demonstrate that spent fuel storage systems are designed to withstand the effects of natural phenomena such as tornadoes during ISFSI handling operations. Conducting these ISFSI handling operations without a written evaluation that demonstrates that ISFSI structures, systems, or components (SSCs) important to safety are designed to withstand the effects of site-specific natural phenomena represents an unanalyzed condition and is not in compliance with applicable NRC regulations.

As stated in 10 CFR Part 72, the NRC authorizes the storage of spent nuclear fuel at an ISFSI facility under a site-specific or general license. The design, inspection, testing, and operational requirements of ISFSI SSCs important to safety are set forth in subpart F of 10 CFR Part 72, "General Design Criteria." For both site-specific and general licensees, Section 72.122(b)(1) and (2), "Protection against environmental conditions and natural phenomena," requires, in part, that ISFSI SSCs important to safety must be designed to accommodate and withstand the effects of natural phenomena, including tornadoes, without impairing their capability to perform their intended design functions. The design bases for these SSCs must reflect, in part, appropriate consideration of the most severe of the natural phenomena reported for the site and surrounding area. Additionally, 10 CFR 72.212(b)(6) requires, in part, that a general licensee review the Final Safety Analysis Report referenced in the Certificate of Compliance (CoC)², as amended, and the related NRC Safety Evaluation Report (SER), prior to use of its general license, to determine whether or not the reactor site parameters, including analyses of earthquake intensity and tornado missiles, are enveloped by the cask design bases considered in these reports.

BASIS FOR ENFORCEMENT DISCRETION:

In general, the NRC has extensive history analyzing severe weather events including tornado hazard scenarios using probabilistic methods (or risk assessments) in licensing on a case-by-case basis to assess specific plant features to prevent a release of radioactivity exceeding regulatory limits. For ISFSIs, such methods can be employed, supported by analysis, to

² Part 72, subpart L establishes requirements for the approval of spent fuel storage cask designs, as documented in an NRC Certificate of Compliance (CoC). The CoC specifies the cask requirements for normal, off-normal, and credible accident conditions in accordance with Section 72.236, "Specific requirements for spent fuel storage cask approval and fabrication."

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demonstrate that tornado hazards will not impair the capability of SSCs important to safety to perform their intended design functions.

The Office of Nuclear Reactor Regulation (NRR) completed a generic risk analysis of potential tornado missile protection non-compliances to examine the risk significance of tornado hazard scenarios (Agencywide Documents Access and Management System (ADAMS) at Accession No. ML14114A556). In this case, the generic bounding risk analysis performed by NRR concluded that a tornado missile scenario is of low-risk significance at power reactor sites, due in part to the low probability of wind speeds exceeding 75 miles per hour (less than 4×10^{-4} per year). This generic analysis did not specifically address ISFSI handling operations but there are several key insights in the analysis that may apply to a risk assessment for this issue. Specifically, rather than evaluate site-specific configurations, the NRR generic analysis used bounding assumptions regarding tornado and high winds initiating event frequencies (IEFs) coupled with bounding assumptions for missile strike area to develop conservative estimates of core-damage frequency. This generic analysis assumes that plants are in a condition vulnerable to a tornado for a full reactor-year worth of exposure time.

For ISFSI handling operations, the vulnerable configuration would be typically limited to a few weeks of exposure time per year which would result in additional conservatism to the results documented in the NRR generic analysis. Furthermore, ISFSI handling operations that may lead to loss of confinement of radioactive material due to a missile strike or high winds should be bounded by the assumptions regarding tornado and high winds IEFs. Appropriate administrative controls including compensatory measures would provide defense-in-depth and further reduce the likelihood of occurrence and mitigate loss of confinement events. This defense-in-depth approach should include provisions to (1) preclude ISFSI handling operations during periods of adverse weather or when adverse weather is predicted, and (2) provide compensatory measures to place important to safety SSCs in an analyzed condition or provide physical protection as necessary to maintain confinement of radioactive material during ISFSI handling operations.

In summary, the combination of the low probability of tornado events in conjunction with formally documented administrative controls that (1) restrict initiation of ISFSI handling operations during projected periods of adverse weather and, (2) cease ISFSI handling operations and place important to safety SSCs in a protected configuration or analyzed condition at the outset of adverse weather conditions, form the basis for the exercise of enforcement discretion for ISFSI handling operations. As a further condition of this enforcement discretion, licensees will conduct a site-specific assessment to determine the appropriate corrective actions to ensure that important to safety SSCs will not be adversely impacted by tornado hazards. As such, the exercise of enforcement discretion limited to the conditions of this EGM will not impose significant additional risk to public health and safety.

ACTIONS:

This EGM applies specifically to a discrete period when licensees conduct ISFSI handling operations without an analysis or evaluation as required by 10 CFR Parts 72.48, 72.122, or 72.212. The staff may exercise enforcement discretion in accordance with this EGM only when a licensee meets the following conditions:

1. Licensees will develop, revise, or review procedures to establish administrative controls that implement compensatory measures to mitigate tornado hazards during periods of ISFSI handling operations to include, at a minimum, the following:

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- a) Preclude starting ISFSI handling operations during periods of predicted adverse weather. For the purposes of this EGM, adverse weather should include any severe hazards weather advisory, watch, or warning related to tornado hazards.
 - b) Establish meteorological monitoring criteria and assign staff to monitor weather during ISFSI handling operations.
 - c) Describe actions to be taken if a severe weather hazard (e.g., weather advisory, warning, or watch) is predicted or issued for the area, including actions to cease ISFSI handling operations, and the actions necessary to place important to safety SSCs in a protected configuration or analyzed condition.
 - d) Minimize the duration of ISFSI handling operations during which ISFSI important to safety SSCs are in an unanalyzed condition.
2. Prior to starting ISFSI handling operations, licensees shall document (e.g., procedure, check list, log in the control room logs, etc.) that required weather checks, as described above, are complete.
 3. Licensees shall document within their corrective action program one of the following actions necessary to restore compliance:
 - a) for a specific licensee - submit a license amendment request within six months of the issuance date of this EGM,
 - b) for a general licensee - within six months of the issuance date of this EGM, request the certificate holder for a spent fuel storage cask design to submit a CoC amendment request, and adopt the amendment, if approved by the NRC, through a Part 72.212 evaluation, or
 - c) for either a general or specific licensee - prior to the expiration date of this EGM, implement physical design modifications and/or perform evaluations or analysis that demonstrates that SSCs important to safety are designed to withstand the effects of natural phenomena, including tornadoes and tornado-generated missiles.

The NRC staff will assign an enforcement action (EA) tracking number to any inspection report that documents using this EGM as the basis for exercising enforcement discretion. An enforcement panel is not required unless a site-specific issue warrants further evaluation; in this case another EA number would be required. The cover letter to the inspection report that discusses the violation should include the following or similar language:

“The NRC (or licensee) identified a violation of [state the regulation/requirement, e.g., the licensee’s current site-specific licensing basis, 10 CFR 72.122(b)(i), 10 CFR 72.48, etc.] associated with tornado hazard protection. Because this violation was identified during the discretion period covered by Enforcement Guidance Memorandum 22-001, “Enforcement Discretion for Noncompliance of Tornado Hazard Protection requirements at Independent Spent Fuel Storage

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Installations,” and because the licensee was implementing compensatory measures and has taken or plans to take the necessary actions to restore compliance, the NRC is exercising enforcement discretion by not issuing an enforcement action for the violation and is allowing continued ISFSI handling operations.”

On a case-by-case basis, a previously identified noncompliance within the scope of this EGM may be considered for enforcement discretion in accordance with Section 3.5, “Violations Involving Special Circumstances,” of the Enforcement Policy.

EXPIRATION:

This enforcement discretion will expire 2 years after the issuance date of this EGM.

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