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W3F1-2009-0043

September 16, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: NRC Inspection Report 50-382/2009-003
Reply to Non-Cited Violation
Waterford Steam Electric Station, Unit 3
Docket No. 50-382
License No. NPF-38

Dear Sir or Madam:

Entergy Operations, Incorporated hereby submits a reply to the NRC Green Non-Cited Violation for the failure to develop and have in place guidelines for the choice of protective actions during an emergency that were consistent with federal guidance. Entergy acknowledges the violation. Additional technical and regulatory information is included in Attachment 1, Reply to Non-Cited Violation.

Entergy has engaged other licensees and established that the application of protective actions by Waterford 3 is consistent with industry practice. We obtained local and state agency perspective, and received their acknowledgement that the application of protective actions as currently implemented by Waterford 3 has substantial merit and promotes public health and safety.

We believe the regulatory concern identified in the violation raises important generic technical and regulatory issues. We concur that preset protective actions based on plant conditions alone may not always constitute the best approach and that there are improvements that can be made to resolve these generic issues. We recommend that the resolution of this generic issue should be a Generic Communication with engagement and participation by all stakeholders, including industry, NEI, FEMA, and local and state agencies via the NEI Resolution Process.

IEOI
KRR

There are no regulatory commitments in this submittal. Should you have any questions or comments concerning this submittal, please contact Robert Murillo, Manager, Licensing at (504) 739-6715.

Sincerely,

A handwritten signature in cursive script that reads "Kenny J. Christian". The signature is written in black ink and is positioned below the word "Sincerely,".

KJC/JJL/jdw

Attachments:

1. Reply to Non-Cited Violation, NRC Inspection Report 50-382/2009-003

cc: Mr. Elmo E. Collins, Jr.
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Attachment 1

W3F1-2009-0043

**Reply to Non-Cited Violation
NRC Inspection Report 50-382/2009-003**

1.0 Restatement of Non-Cited Violation

The inspectors identified a noncited violation of 10 CFR 50.47(b)(10) for the licensee's failure to develop and have in place guidelines for the choice of protective actions during an emergency that were consistent with federal guidance. Specifically, the licensee's guidelines for extending existing protective action recommendations into additional geographical areas of the emergency planning zone under conditions of changing wind vectors were not consistent with the guidance of EPA-400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents." The licensee's practices resulted in unnecessary recommendations for protective actions in areas where valid dose projections show federal protective action guides are not exceeded, and may expose members of the public to unjustified risks. The licensee has entered this issue into their corrective action system as Condition Report CR-WF3-2009-03256.

This finding was more than minor because it was not similar to the examples of Manual Chapter 0612, Appendix E, and affected the emergency preparedness cornerstone objective because unnecessary protective actions may expose members of the public to an unjustified risk. The finding was associated with the emergency response organization attributes of 50.47(b) planning standards and training. This finding was of very low safety significance because it was not a risk significant planning standard functional failure or degraded function because licensee protective action recommendations would be issued in accordance with federal guidance for all areas of the emergency planning zone where Protective Action Guides are exceeded. This finding was evaluated as not having a crosscutting aspect because the finding was not indicative of current licensee performance (Section 1EP1).

2.0 Summary of Waterford 3 Position

We have reviewed the Non Cited Violation (NCV) referenced in NRC inspection report 05000382/2009-003. To address the NCV Entergy will evaluate EPA 400 requirements, review current industry practices, and consult with Waterford-3 Offsite Response Organization (ORO) stakeholders and based on the information obtained take actions as necessary to update the PAR process and procedures at Waterford 3.

Although we acknowledge the NCV, we offer the following additional information:

- The NCV is largely based on EPA-400 which is guidance that is primarily directed at Off Site Response Organizations (OROs) as stated in the forward to the document.¹
- The NCV appears to contradict some of the guidance in Regulatory Issue Summary (RIS) 2005-08 through which NRC endorsed the industry protective action implementation scheme.
- The NCV does not take into consideration the expectations of local Parish and Louisiana State government.

¹ EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", page iii.

- The NCV appears to place a heavy reliance on the accuracy of dose projections rather than recognizing that the accuracy of dose projections is limited particularly during the early phases of an event.

We believe the regulatory concern identified by the NCV raises important generic technical and regulatory issues and that this matter deserves follow up and technical analysis. The referenced bases in EPA-400 do not appear to support the position of basing all protective action recommendations solely on dose assessment subsequent to the initial plant-based recommendation. In addition, the NCV does not reference the information contained in other federal guidance that either does not support this methodology for making protective action recommendations or at the least makes the position unclear for industry. Furthermore, the approach taken by Waterford-3 is not isolated. It is, in fact, representative of current industry practice and the expectations of Off Site Response Organizations (OROs). In that regard, NRC should take into consideration the implications of this finding on current practices throughout the nuclear industry. Since OROs may be significantly impacted by the proposed NCV, FEMA is a stakeholder in this matter as well.

We concur that preset protective actions based on plant conditions alone may not always constitute the best approach and that there are improvements that can be made. Due to the significant precedent setting impact that this NCV creates, we recommend that the resolution of this generic issue should be a Generic Communication with engagement and participation by all stakeholders, including industry, NEI, FEMA, and local and state agencies via the NEI Resolution Process.

3.0 Discussion

COMPLEXITIES OF THE APPLICATION OF DOSE ASSESSMENT FOR PROTECTIVE ACTION RECOMMENDATIONS

The Environmental Protection Agency (EPA) recognizes that determining protective actions for actual or potential radiation exposure from nuclear power plant accidents is a complex and difficult activity². The process of predicting dose from any particular event is difficult and, in the early phases of an event, parameters other than projected dose provide a basis for decision making related to implementation of protective actions^{3,4}.

In the early phase of an accident, particularly when a facility is operating outside of its design basis, data suitable for dose estimation / projection may not be available⁵. EPA clearly recommends for such cases (early phases of an accident and beyond-design-basis conditions) emergency planning should establish emergency action levels (EALs) that trigger preset protective action strategies⁶. Furthermore, in the early phases of an

² EPA 400-R-92-001, "Manual of Protective Action Guides and Protective Actions for Nuclear Incidents", Section 2.3.1, page 2-5

³ EPA 400 Section 2.4, page 2-8

⁴ NUREG/BR-0150, "Response Technical Manual, RTM, Revision 5, October 2002, page G-3

⁵ EPA 400 Section 2.4, page 2-8

⁶ EPA 400 Section 2.4, page 2-8

event when accurate dose assessment data are not available, it is appropriate to use planned protective actions including evacuation and sheltering for designated areas⁷.

EPA guidance continues that after a release of radioactive material has commenced, when the release rate is measurable, and when characteristics of the release and release rate as a function of time can be determined, dose projections should be used for developing additional protective actions⁸.

In order to make reasonable dose projections, EPA indicates that the release characteristics (isotopic distribution, release rate, atmospheric stability, wind speed, wind direction) are necessary and appropriate. Dose assessment is so diverse and varied that it may take hours or days of dose projections, field data correlation and sample analysis to gain the requisite confidence in the degree of accuracy of the assessment. It could take many days before there could be a full deployment of the Department of Energy's Federal Radiological Monitoring and Assessment Center (FRMAC) capabilities. In addition, the concept of valid dose projection is not defined within EPA-400 and is subject to wide variation and latitude. Experience has shown that the uncertainties associated with dose projection may be quite large compared with actual field measurements. It is not unusual to experience differences between projected and measured doses as large as one or two orders of magnitude. This is due to the difficulty in accurately determining source term and dispersion parameters.

NRC guidance also indicates that relaxation of protective action recommendations is inappropriate until the threat of a release is over and any ground contamination has been characterized and discussed with state officials⁹. This could also be interpreted to extend to the nature of how protective action expansions are made based on changing plant or meteorological conditions.

NRC RIS 2005-08 endorsed an NEI paper on protective actions. The endorsed NEI position is that for a General Emergency a "default" protective action recommendation is to "Evacuate at least 2 miles around and 5 miles downwind and advise the remainder of the EPZ to go indoors and listen to EAS". The default PAR may be made based on plant conditions even when there is not radiological risk present at the time.

The referenced NCV attributes a performance deficiency in Waterford-3's method of extending protective action recommendations because those actions "may expose members of the public to unjustified risks." However, the very nature of default PARs endorsed in EPA-400 and NRC RIS 2005-08 fall on the side of conservative decision making since such actions could also expose members of the public to risks that are greater than might be attributed to subsequent radiation exposure.

EPA guidance does not take the position that plant conditions should not be considered in taking protective actions. It states that dose projections may be used in addition to plant conditions. EPA-400 notes that in the Early Phase of an event (up to several days) protective action recommendations are usually "based on the status of the nuclear

⁷ EPA 400 Section 5.2.2, page 5-4

⁸ EPA 400 Section 5.2.2, page 5-4

⁹ RTM; Revision 5, October 2002 page G-6

facility”¹⁰. Waterford-3 practices are consistent with this EPA-400 guidance. The EPA guidance does not place a preference on dose projections nor does it indicate that dose projections should be used alone disassociated from plant conditions. It indicates that dose projections are appropriately considered in conjunction with plant conditions. In apparent agreement with this concept, the flow chart in Figure G-1 of NRC’s Response Technical Manual indicates the need for continued assessment based on both plant conditions and field monitoring information following an initial Protective Action decision¹¹. Field monitoring and sample analysis in this context is part of the dose assessment process.

The NRC has a legitimate concern that protective action recommendations that are made in a “cook book” fashion may be overly conservative. Such recommendations would potentially create a health risk greater than that from a radioactive release if the “cook book” were to recommend actions in areas that were not currently or likely to experience the effects of a radioactive plume. In the case at hand, NRC is concerned that extending protective actions to additional areas as a result of a wind shift merely by extending a previous plant condition based PAR could be overly conservative. EPA guidance clearly directs consideration of protective actions for doses that will be accrued rather than dose that has already occurred¹². Thus, using this forward looking approach, dose assessments that would indicate a new but smaller down wind affected area than reliance on previous plant conditions would necessitate making a PAR that encompassed a smaller area.

This makes sense in principle but it is not so easy to do in reality. First, it is necessary to understand plant conditions and have confidence that they are such that release characteristics and release rates will, indeed, result in dose consequences that will affect areas smaller than those that would be based on previous plant conditions. Second, it is necessary to understand that meteorological conditions will also result in smaller affected areas. Third, it is appropriate to take into consideration the capabilities for protective action implementation by the local and state government, as appropriate. The parishes of St John the Baptist and St. Charles as well as the State of Louisiana have developed emergency plans and procedures which utilize the guidance in EPA-400 in so far as establishing preset protective actions for a general emergency at the Waterford-3 nuclear station. Those preset protective actions have been discussed with the licensee and have resulted in the current procedures and practices that occur during the early phase of a general emergency and when conditions change necessitating modification of protective actions.

REGULATORY GUIDANCE ON PROTECTIVE ACTIONS BASED ON PLANT CONDITIONS AND EMERGENCY CLASSIFICATIONS

The position taken in the NCV appears to be based on an interpretation that relies heavily on some of the guidance in EPA-400 to the exclusion of other factors in the same document and other regulatory guidance. EPA-400 recognizes the difficulties and uncertainty associated with the dose assessment process even under relatively good

¹⁰ EPA 400 Section 1.1, page 1-2, 1-3

¹¹ RTM, Revision 5, October 2002, page G-9

¹² EPA 400 Section 2.4, page 2-9

data gathering conditions and is not definitive on confidently using dose assessment as a primary determinant compared with evaluating plant conditions.

NRC has historically provided guidance documents to industry that emphasize the consideration for protective actions based on plant conditions. These include NRC Information Notice 83-28, NUREG-0654 Supplement 3 and RIS 2005-08. NUREG-0654 Supplement 3 indicates that plant conditions are the major determining factors in developing early protective action recommendations.¹³ This guidance document does not define the term "early," but also does not imply a position that this guidance only applies to the first recommendation and that all others are based on dose assessment results alone. EPA-400 defines the "early phase" as the period beginning at the projected (or actual) initiation of a release and extending to a few days later, when the deposition of airborne materials has ceased and enough information has become available to permit reliable decisions about the need for longer term protection.¹⁴

NUREG-0654 Supplement 3 also indicates that decision makers "consider" EPA PAGs in modifying initial protective actions.¹⁵ This direction to "consider" EPA PAGs does not appear to be direction to base all subsequent protective action recommendations on EPA PAGs alone. This direction may in fact be interpreted (as is common in the industry) to mean using the EPA PAGs to modify the recommendations based on plant conditions when doses in excess of the PAG values extend further downwind than the limits of the initial protective action recommendation.

RIS 2005-08 states that licensees who incorporate the "industry positions" detailed in the document would be compliant with the early phase protective action guidance.¹⁶ RIS 2005-08 indicates in an industry position that the minimum recommendation that shall be made at a General Emergency is to evacuate approximately 2 miles around and 5 miles downwind from the plant. Subsequent recommendations should be based on the EPA PAG's, changing plant conditions, field team data or changes in meteorological conditions.¹⁷ This guidance does not indicate that subsequent recommendations are to be based on dose assessment alone, but treats each condition as equal, including changing meteorological data (e.g., wind shift). This equal treatment of various parameters in the guidance is also illustrated by a decision flow chart.¹⁸ It is not clear in any of the guidance referenced above that EPA-400 protective action guides are applied very early in the event (after the initial minimum General Emergency recommendation) to the exclusion of all other bases for recommended actions, such as continuing General Emergency plant conditions.

Extension of the Waterford 3 offsite protective response sectors based on plant conditions when a winds shift occurs is a preemptory action just as the San Onofre Nuclear Generating Station (SONGS) procedural action of evacuation of the state beach at an Alert emergency classification is a preemptory action. The SONGS protective

¹³ NUREG-0654 Supplement 3 Section 1.B, page 1

¹⁴ EPA 400 Section 2.1.3, page 2-3

¹⁵ NUREG-0654 Supplement 3 Figure 1, page 1-19

¹⁶ RIS 2005-08, Section 1.0, page 1

¹⁷ RIS 2005-08, Section 2.3.1, page 3

¹⁸ RIS 2005-08, Section 3.0, page 5

action recommendation scheme was reviewed and approved by the NRC in 2006¹⁹. This example perhaps further illustrates the various and differing regulatory body of guidance and precedence available to licensees.

4.0 Industry Stakeholders and Generic Implications of the NCV

As part of the evaluation of the NCV, Entergy representatives canvassed 23 licensees to understand their experience with the type of issue presented. This effort demonstrated that many licensees use the PAR expansion method employed at Waterford-3 for a wind shift condition. Thus, the NCV has implications for many licensees and should be considered in that light as a generic issue that should be addressed more broadly.

5.0 Offsite Stakeholders

The substance of the proposed NCV has been shared with St. Charles Parish, St. John the Baptist Parish and the Louisiana Department of Environmental Quality. These agencies are in agreement with the strategy employed by Waterford 3 for making protective action recommendations and would be opposed to a significant change in the methodology currently used.

During an event of a magnitude that protective action recommendations would be appropriate, time is of the essence in promulgating the direction from government officials to members of the public. Preplanned protective action strategies such as those employed at Waterford 3 assist in expediting the flow of emergency information to the public because those recommendations are consistent with ORO expectations and emergency plans.

¹⁹ NRC ADAMS ML063400271 12/6/06, San Onofre Nuclear Generating Station, Units 1, 2, and 3, and Independent Spent Fuel Storage Installation - Re: Proposed Emergency Plan Changes to Revise the Protective Action Recommendation Methodology