



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

April 8, 2015

LICENSEE: FirstEnergy Nuclear Operating Company

FACILITY: Perry Nuclear Power Plant, Unit 1

SUBJECT: SUMMARY OF JANUARY 2015 MEETINGS WITH FIRSTENERGY NUCLEAR OPERATING COMPANY TO DISCUSS ALTERNATIVE SOURCE TERM IMPLEMENTATION AS A RESULT OF FUEL CHANGE

On January 7 and 28, 2015, the U.S. Nuclear Regulatory Commission (NRC) staff conducted Category 1 public meetings with FirstEnergy Nuclear Operating Company (FENOC, the licensee). Both meetings were held via teleconference. The purpose of these meetings were to discuss various topics related to the licensee's request to change the previously approved alternative source term (AST) methodology to reflect a change from General Electric (GE)-14 to Global Nuclear Fuel (GNF)-2 fuel at Perry Nuclear Power Plant, Unit 1 (Perry). The enclosure contains a list of attendees for both meetings.

BACKGROUND

In an application dated December 6, 2013 (Agencywide Documents Access & Management System (ADAMS) Accession No. ML13343A013), FENOC submitted a license amendment request which proposes to revise the Perry Updated Safety Analysis Report (USAR) to reflect updated radiological calculations performed using an AST methodology and a modification of the definition of DOSE EQUIVALENT IODINE-131 in the technical specifications (TS). The NRC staff transmitted the attached discussion topics to support both meetings. A revised version of these topics were later issued to the licensee in a letter dated January 15, 2015 (ADAMS Accession No. ML15014A283).

DISCUSSION

The NRC staff and the licensee discussed issues with the request primarily associated with the meteorology assumptions as discussed in Section 5.3 of Regulatory Guide 1.183 (ADAMS Accession No. ML003716792). The discussions included an explanation by the licensee regarding similarities (i.e., orientation of the air intakes relative to potential release points) and differences (i.e., elevation of the air intakes) between the Technical Support Center (TSC) and Control Room (CR) intake locations, and perceived effects on atmospheric dispersion values (x/Q) at the two locations had tracer gas measurements been made at the TSC air intake. The January 7th meeting covered the discussion topics, while the January 28th meeting focused primarily with modelling assumptions related to the discussion topics and the licensee's justifications for use of those assumptions.

The NRC staff had questions concerning the wind speeds during the tracer gas study as it appeared to cause sufficient building wake turbulence to mix or transport the tracer gas to the CR intakes and how those conditions might affect x/Q values at the TSC air intake which is at a

lower elevation. The licensee described the site configuration and how that information supported the χ/Q values at the TSC air intake. At the January 28th meeting, the licensee indicated that they would consider adjusting the χ/Q values to support the TSC analyses. The licensee also clarified that although mentioned in the submittal, the offsite TSC was located more than 10 miles from the facility and would not be credited as part of the onsite TSC analyses.

The licensee addressed the derivation of a 1-hour average TSC χ/Q value including ratios between dispersion modeling studies (using the then available Murphy-Campe modeling methodology for these situations and the original 3-year licensing basis meteorological data set) and the corresponding CR χ/Q value based on the tracer gas study.

The discussions continued to address further scaling of the 1-hour average TSC χ/Q value by applying time-dependent wind direction (but not wind speed) adjustment factors, based on guidance in the Murphy-Campe dispersion model, to derive χ/Q s for the 0- to 8-hour, 8- to 24-hour, 24- to 96-hour, and 96- to 720-hour accident time intervals.

During the January 7, 2015, meeting one member of the public was in attendance. This stakeholder made a comment regarding stress corrosion at nuclear facilities. No feedback forms were received. No commitments or regulatory decisions were made by the NRC staff during the meeting.

/RA/

Eva A. Brown, Senior Project Manager
Plant Licensing III-2 and
Planning and Analysis Branch
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-440

Enclosures:

1. List of Attendees
2. Discussion Topics

cc w/encl: Distribution via Listserv

Participants
Nuclear Regulatory Commission
Public Meeting with FirstEnergy Nuclear Operating Company
Regarding Updated Alternative Source Term

January 7, 2015

U. S. NUCLEAR REGULATORY COMMISSION

Jason White
Michael Mazaika
Undine Shoop
Eva Brown

FIRSTENERGY NUCLEAR OPERATING COMPANY

Robb Borland
Tom Lentz
Paul Messman
Earl (Tom) Tomlinson
Brad Ferrell
Al Widmer
Bob Coad
Phil Lashley

PUBLIC

Marv Lewis

January 28, 2015

U. S. NUCLEAR REGULATORY COMMISSION

Jason White
Michael Mazaika
Kenneth Erwin
Eva Brown

FIRSTENERGY NUCLEAR OPERATING COMPANY

Tom Lentz
Earl (Tom) Thomlinson
Brad Ferrell
Marvin Morris
Bob Coad

DISCUSSION TOPICS

ALTERNATIVE SOURCE TERM DESIGN BASES

FIRSTENERGY NUCLEAR OPERATING COMPANY

PERRY NUCLEAR POWER PLANT, UNIT NO. 1

DOCKET NO. 50-440

1. In the December 6, 2013, submittal, the licensee proposed to update Table 15.6-13 of the Updated Safety Analysis Report (USAR) to reflect two corrections to χ/Q values for the 24-96 hour χ/Q and the 96-720 hour χ/Q approved by the U.S. Nuclear Regulatory Commission (NRC) staff in March 1999. The change to the 24-96 hour (1-4 day) χ/Q is an order of magnitude increase (i.e., from E-5 to E-4).
 - a. Address whether the original values are currently credited to determine control room (CR) dose in any affected accident scenario.
 - b. Address the application of these corrected values in determining the CR dose for any affected accident scenario.
2. In Table 6-4 of the October 8, 2014, supplement, the licensee indicated that the onsite tracer gas study did not include sampling and estimation of X/Qs at the intakes to the building housing the onsite Technical Support Center (TSC) in its basement. The licensee discussed similarities in the exposures of the air intakes to the CR and the onsite TSC and how dispersion and dilution might be slightly different for the two receptor locations with the relative concentrations at the TSC expected to be somewhat lower. The short-term X/Qs for the onsite TSC appear to apply scaling factors using scaled time dependent wind direction factors. The licensee also indicates that the;

TSC intake....is located southwest of the control room intakes, on the southwest corner (west face) of the Service Building

- a. Discuss why the relationship between the CR X/Qs and the estimated TSC X/Qs, based on the tracer gas study and the estimated X/Qs at the air intakes for the onsite TSC, are not affected by the dispersion conditions at the corners of the Service Building.
- b. Discuss why the proposed, scaled X/Q values for the onsite TSC were not adjusted to account for the same measurement uncertainties in the tracer gas study as was the case for the CR X/Qs.
- c. As the resulting onsite TSC X/Q values were scaled, from earlier Murphy-Campe modeling results, which accounted for variations in wind direction and wind speed as input to the model, and the acknowledged limitation that the "testing may not have captured the full range of poor dispersion conditions". Explain the footnote on page 6 of the October 8, 2014, supplement, which states:

"Time dependent wind speed factors, which would have further reduced X/Qs, were not applied"

3. Figure 1 of Attachment 6 to the December 6, 2013, submittal, illustrates that the assumed direct release to atmosphere for this accident scenario is from the Auxiliary Building. Assuming a release location for the main steamline break outside containment (MSLBOC) accident that is different from the design-basis loss-of-coolant accident (LOCA) release location (i.e., from the outer edge of the Containment Building as indicated in Subsection 2.3.4.2 of the USAR), discuss the following:
 - a. Whether the distances to the exclusion area boundary and the low population zone receptors from the potential MSLBOC release point are less than the distances implied by assuming that the same X/Q values for the design-basis accident apply for the MSLBOC release scenario and either justify their applicability and use or revise as necessary;
 - b. The release elevation for the MSLBOC, its orientation (relative to True North) with respect to the CR air intake locations, and its distance to those intakes;
 - c. Given any differences and/or uncertainties noted previously for the onsite tracer study and its results (especially if source-receptor distances are less and/or orientations are different), address the use of the same adjusted CR X/Q values for the LOCA release scenario; and,
 - d. Confirm that the LOCA release still represents the controlling accident scenario for the CR.
4. In support of the NRC's staff confirmatory analysis of the estimated onsite TSC X/Q values and for the MSLBOC accident provide and discuss the following analysis inputs:
 - a. Sequential, hourly onsite meteorological data for a representative period of record (POR), including upper and lower measurement heights and units of measure (NOTE: previous confirmatory modeling analyses by the NRC were based on a 5-year POR from 1993 to 1997);
 - b. Scaled drawings showing the locations and heights of the release points for the LOCA and for the MSLBOC accident, the TSC and CR intake locations and heights, distances between the release points (sources) and receptors, and orientations relative to True North from the receptors to the sources, and from which building heights and dimensions can be determined; and
 - c. Release characteristics for each source, as applicable, including vertical velocity, flow rate, stack radius (and associated units of measure).

lower elevation. The licensee described the site configuration and how that information supported the χ/Q values at the TSC air intake. At the January 28th meeting, the licensee indicated that they would consider adjusting the χ/Q values to support the TSC analyses. The licensee also clarified that although mentioned in the submittal, the offsite TSC was located more than 10 miles from the facility and would not be credited as part of the onsite TSC analyses.

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DISTRIBUTION:

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ADAMS Accession No. ML15075A246

NRC-001

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