

From: Chawla, Mahesh
Sent: Thursday, January 14, 2010 3:32 PM
To: Alan I Hassoun
Cc: Goel, Vijay; Matharu, Gurcharan; Wilson, George; Pascarelli, Robert
Subject: Fermi 2 - LAR to Revise Degraded Voltage Function Requirements of TS Table 3.3.8.1-1 to Reflect Undervoltage Backfit Modification - ME 1477 - Revised RAIs

Sam,

Following is the revised version of the draft RAIs which were sent to you via e-mail on December 14, 2009. The reason for the revision is a result of the teleconference you had with NRC staff on 01/07/10. For your convenience, I have highlighted the revised portions in bold italics. Please let me know if you would like to have another teleconference with the NRC staff to discuss these changes. If no further clarifications are needed, I would like to transmit these in a letter to you.

"By letter dated June 10, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML091680379), Detroit Edition (the licensee) submitted a license amendment request (LAR) for Fermi 2 nuclear plant to revise the Degraded Voltage Function in the Technical Specifications (TS) Table 3.3.8.1-1. Specifically, the proposed amendment is to add new time delay logic associated with the degraded voltage function concurrent with a loss-of-coolant accident (LOCA).

By letter dated September 16, 2009 (ML093070294), the licensee provided supplemental information in response to the staff's request dated July 27, 2009. The NRC staff has reviewed the supplemental information provided by the licensee and has determined that additional information (follow-up) is required for the evaluation of the proposed change. Please let me know if you would like to have a teleconference to discuss the following information with the NRC staff.

Follow-up RAI #1: The licensee in its letter dated September 16, 2009, in response to RAI #1, stated that the minimum offsite voltage on the Division I, 120 kV system for which large motors can start and all safety related equipment can operate continuously with Load Tap Changer (LTC) operation on Transformer SS64 is 93.3%. The minimum offsite voltage on the Division II, 345 kV system for which large motors can start and safety related equipment can operate continuously is 98.4%.

(a) Explain the grid contingencies that were considered to ensure the switchyard voltages remain above the voltages identified, i.e., 93.3% at 120 kV and 98.4% at 345 kV at switchyard buses.

(b) Provide supporting data or analysis to show that the degraded voltage relay settings are adequate when the switchyard voltages are just above the minimum voltages identified above, to protect all Class 1E equipment.

(c) The degraded voltage relay (DVR) for Division I is set at approximately 96.9% and has a time delay of approximately 8.4 seconds for the LOCA case and 46.2 seconds for non LOCA case. The loss of voltage relay (LVR) for Division I is set at approximately 74.4%. The DVR and LVR protect safety related equipment. For the non LOCA event, there can be potential for the safety related equipment

to be subjected to approximately 75% bus voltage for up to 46 seconds (multiple grid issues, DVR timing out and LVR not actuated). Explain under this condition, how will the safety related equipment remain adequately protected.

Follow-up RAI #2: The licensee in its letter dated September 16, 2009, in response to RAI #1, stated that the existing ABB 27D relays will be replaced with ABB 27N relays and additional time delay relays to achieve the LOCA degraded voltage time delay logic.

Confirm that new ABB 27N relays will provide Technical Specifications (TS) Table 3.3.8.1-1 Function 2a and Function 2b of the previous 27D relays, and that Function 2c will be provided by new time-delay (TD) relays. Also, provide catalog information for these relays, including **logic drawings** showing function of these new relays.

Follow-up RAI #3: The licensee in its letter dated September 16, 2009, in response to RAI #1, in the discussion under the heading "Time Delay for Degraded Voltage (Without LOCA)", has considered start of two Residual Heat Removal (RHR) pumps, with two Core Spray pumps starting five seconds later, in each Division.

Clarify the purpose of starting of two RHR pumps, and two Core Spray pumps in each division in a non-LOCA scenario.

Follow-up RAI #4: The licensee in its letter dated September 16, 2009, in response to RAI #1, stated that the time delay for a degraded voltage with LOCA is established in pending changes to calculation DC-0919, Volume I for the new degraded voltage time delay. The time delay is selected based on the following:

- a) The maximum time delay which provides load shed and Emergency Diesel Generator (EDG) breaker closure (with RHR pump motor start) at or less than 10 seconds, consistent with the accident analysis.
- b) The minimum time delay that allows sequential starting of LOCA loads without separating from the offsite power supply.

Provide summary/excerpts from the dynamic analysis, which provides the worst case voltage transient profile at the safety-related buses (those provided with degraded voltage relays) following LOCA.

Preferably superimpose the characteristics of degraded voltage relays on the bus voltage transient profile to confirm that degraded voltage relays can ride through the voltage dips experienced during starting of large LOCA loads.

Follow-up RAI #5: The licensee in its letter dated September 16, 2009, in response to RAI #3b, stated that in case of degraded voltage relay tripping with 7.6 seconds to 8.4 seconds of LOCA signal, the loads will be resequenced and the RHR pump motor can re-start a minimum of one second after tripping while the motor is running.

Confirm that one second is adequate for RHR pump motor to decrease its residual voltage to less than 25% of its rated voltage (typically considered safe for restarting purpose). Also, explain the function of degraded voltage and loss of voltage relaying after the safety-related loads are shifted from offsite source to EDG.

Follow-up RAI #6: Function 2.c, Time Delay with LOCA, has been added to TS Table 3.3.8.1-1 with allowable values between 7.6 seconds and 8.4 seconds. Furthermore, the licensee stated in the September 16, 2009, letter that existing ABB 27D relays have been replaced by ABB 27N relays.

Provide calculations including the uncertainties used in the selection of the nominal trip setpoint, allowable value, as-found tolerance, and as-left tolerance for all the functions in TS Table 3.3.8.1-1 affected by the replacement of the existing ABB 27D relays by ABB 27N relays and the addition of the new relay for Function 2.c.

Follow-up RAI #7: Describe the measures to be taken to ensure that the associated instrument channel is capable of performing its specified safety functions in accordance with applicable design requirements and associated analyses. Include in your discussion information on the controls you employ to ensure that the as-left trip setting after completion of periodic surveillance is consistent with your setpoint methodology. Also, discuss the plant corrective action processes (including plant procedures) for restoring channels to operable status when channels are determined to be "inoperable" or "operable but degraded". If the controls are located in a document other than the TS, e.g., plant test procedure, describe how it is ensured that the controls will be implemented. "

Mahesh Chawla
Phone: 301-415-8371
Fax: 301-415-1222

mahesh.chawla@nrc.gov

E-mail Properties

Mail Envelope Properties ()

Subject: Fermi 2 - LAR to Revise Degraded Voltage Function Requirements of TS Table 3.3.8.1-1 to Reflect Undervoltage Backfit Modification - ME 1477 - Revised RAIs
Sent Date: 1/14/2010 3:12:37 PM
Received Date: 1/14/2010 3:32:00 PM
From: Chawla, Mahesh

Created By: Mahesh.Chawla@nrc.gov

Recipients:

hassouna@dteenergy.com (Alan I Hassoun)
Tracking Status: None
Vijay.Goel@nrc.gov (Goel, Vijay)
Tracking Status: None
Gurcharan.Matharu@nrc.gov (Matharu, Gurcharan)
Tracking Status: None
George.Wilson@nrc.gov (Wilson, George)
Tracking Status: None

Robert.Pascarelli@nrc.gov (Pascarelli, Robert)
Tracking Status: None

Post Office:

Files	Size	Date & Time
MESSAGE	18339	1/14/2010

Options

Expiration Date:

Priority: olImportanceNormal

ReplyRequested: False

Return Notification: False

Sensitivity: olNormal

Recipients received: