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FPL Energy.
Duane Arnold Energy Center

July 17, 2008

NG-08-0551
10 CFR 50.90

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

Duane Arnold Energy Center
Docket 50-331
License No. DPR-49

Response to Request for Supplemental Information Regarding Technical Specification Change Request (TSCR-106): "4160 Volt Emergency Bus Undervoltage (Degraded Voltage) Maximum Allowable Value"
Affected Technical Specification: Section 3.3.8.1

References:
1. Letter, R. Anderson (FPL Energy Duane Arnold) to Document Control Desk (USNRC), "Technical Specification Change Request (TSCR-106): 4160V Emergency Bus Undervoltage (Degraded Voltage) Maximum Allowable Value," dated May 30, 2008, NG-08-0366 (ML081630205)
2. Letter, K. Feintuch (USNRC) to R. Anderson (FPL Energy Duane Arnold), "Request for Supplemental Information Pertaining to a License Amendment Request to Revise the 4160 Volt Bus Undervoltage (Degraded Voltage) Maximum Allowed Value (TAC No. MD8950)" dated July 11, 2008 (ML081910106)

In Reference 1, FPL Energy Duane Arnold requested an amendment to the Duane Arnold Energy Center (DAEC) Technical Specifications (TS) revising the TS maximum allowable value for the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relays.

On July 2, 2008, the Staff sent, via facsimile, a request for supplemental information regarding Reference 1. The Staff held a telephone conference with FPL Energy Duane Arnold on July 2, 2008 to discuss the request for supplemental information and to request the supplemental information be provided by July 17, 2008. The Staff's request for supplemental information was formally transmitted to FPL Energy Duane Arnold by letter dated July 11, 2008, Reference 2. The response to this request is provided in the enclosure to this letter.

This letter makes no new commitments or changes to any existing commitments.

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NRR

If you have any questions or require additional information, please contact Mr. Steve Catron at (319) 851-7234.
I declare under penalty of perjury that the foregoing is true and correct.

Executed on July 17, 2008.

Richard L. Anderson
Vice President, Duane Arnold Energy Center
FPL Energy Duane Arnold, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, DAEC, USNRC
Resident Inspector, DAEC, USNRC
D. McGhee (State of Iowa)

Enclosure

Response to Request for Supplemental Information Regarding Technical Specification Change Request (TSCR-106): "4160 Volt Emergency Bus Undervoltage (Degraded Voltage) Maximum Allowable Value"

6 Pages to Follow

Response to Request for Supplemental Information Regarding Technical Specification Change Request (TSCR-106): "4160 Volt Emergency Bus Undervoltage (Degraded Voltage) Maximum Allowable Value"

NRC Question 1:

Setpoint Calculation Methodology: Provide documentation (including sample calculations) of the methodology used for establishing the limiting setpoint (or NSP [nominal setpoint]) and the limiting acceptable values for the As-Found and As-Left setpoints as measured in periodic surveillance testing described below. Indicate the related analytical limits and other limiting design values (and the source of these values) for the setpoint.

FPL Energy Duane Arnold Response:

During the telephone conference on July 2, 2008, it was agreed that FPL Energy Duane Arnold would provide a copy of the 4160 volt Emergency Bus degraded voltage setpoint calculation. The Staff agreed that the calculation would provide a complete and adequate response to this request for supplemental information. FPL Energy Duane Arnold calculation CAL-E95-006, Revision 4 is hereby provided as Attachment 1 to this Enclosure. It should be noted that this calculation conforms to the GE Setpoint Methodology, approved by the NRC in a safety evaluation report dated November 6, 1995.

NRC Question 2:

Safety Limit (SL)-Related Determination: Provide a statement as to whether or not the setpoint is a limiting safety system setting for a variable on which a SL has been placed as discussed in 10 CFR 50.36(d)(1)(ii)(A). Such setpoints are described as "SL-Related" in the discussions that follow. In accordance with 10 CFR 50.36(d)(1)(ii)(A), the following guidance is provided for identifying a list of functions to be included in the subset of limiting safety system settings (LSSSs) specified for variables on which SLs have been placed as defined in Standard Technical Specifications Sections 2.1.1, reactor core SLs and 2.1.2, reactor coolant system pressure SLs. This subset includes automatic protective devices in TSs for specified variables on which SLs have been placed that: (1) initiate a reactor trip: or (2) actuate safety systems. As such these variables provide protection against violating reactor core safety limits, or reactor coolant system pressure boundary safety limits.

Examples of instrument functions that might have LSSSs included in this subset in accordance with the plant-specific licensing basis, are pressurizer pressure reactor trip (pressurized-water reactors), rod block monitor withdrawal blocks (boiling-water reactors), feedwater and main turbine high water level trip (boiling water reactors), and end of cycle recirculation pump trip (boiling-water reactors). If the proposed setpoint is determined not to be SL-Related, explain the basis for this determination.

FPL Energy Duane Arnold Response:

Based on the following information, FPL Energy Duane Arnold asserts that the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum Allowable Value (AV) is

not a limiting safety system setting for a variable on which a safety limit (SL) has been placed as discussed in 10 CFR 50.36(d)(1)(ii)(A), i.e., not "SL-Related."

TS Bases Section 3.3.8.1, LOP [Loss of Power], Applicable Safety Analyses, LCO and Applicability discussion contains the following statements regarding 4160 volt Emergency Bus degraded voltage protection:

- [page 3.3-216] The LOP instrumentation also serves to provide protection for the ESF [Engineered Safety Features] from damage that could occur due to prolonged degraded voltage conditions on the grid.
- [page 3.3-216] Disconnecting the emergency buses from the offsite sources and starting the DGs [onsite emergency diesel generators] when a prolonged degraded voltage condition exists ensures that the ESF (e.g., large pump motors) are not damaged due to starting with insufficient voltage present.
- [page 3.3-218] A reduced voltage condition on a 4160 volt emergency bus indicates that, while offsite power may not be completely lost to the respective emergency bus, available power may be insufficient for starting large ECCS [Emergency Core Cooling System] motors without risking damage to the motors that could disable the ECCS function.

As noted in the TS Bases quoted above, the purpose of the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relays is to prevent an unexpected degradation of offsite power from reducing the voltage on the 4160 volt Emergency Buses below the minimum operating voltage for all safety loads. If offsite power experiences a voltage condition below the 4160 volt degraded voltage trip setpoint for a specified period of time, the buses will be disconnected from offsite power and automatically transferred to the onsite emergency diesel generators. The 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay *minimum* AV ensures that the Emergency buses are transferred to the onsite emergency diesel generators such that all safety loads are supplied a voltage greater than the required minimum operating voltage. The *minimum* AV for the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relays is unchanged. The *maximum* AV for these relays is established such that potential transients on the offsite power grid and bus voltage dips due to the starting of large motors will not cause a spurious transfer from the offsite power source to the onsite emergency diesel generators. The maximum AV for these relays prevents undesirable spurious transfers of loads to the onsite emergency diesel generators when grid voltages are adequate to support operation of the plant.

DAEC TS Section 2.1.1 defines the following Reactor Core SLs:

2.1.1.1 Fuel Cladding Integrity – With the reactor steam dome pressure < 785 psig or core flow < 10% rated core flow:
THERMAL POWER shall be ≤ 21.7% RTP [Rated Thermal Power].

2.1.1.2 MCPR [Minimum Critical Power Ratio] – With the reactor steam dome pressure ≥ 785 psig and core flow ≥ 10% rated core flow:

MCPR shall be ≥ 1.10 for two recirculation loop operation or ≥ 1.12 for single recirculation loop operation.

2.1.1.3 Reactor Vessel Water Level – Reactor vessel water level shall be greater than 15 inches above the top of irradiated fuel.

DAEC TS Section 2.1.2 defines the following Reactor Coolant System Pressure SL:

Reactor steam dome pressure shall be ≤ 1335 psig.

The design basis accidents and transients in the DAEC Updated Final Safety Analysis Report (UFSAR) do not credit the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relays in the mitigation of any analyzed event to protect any of the SLs listed above. These UFSAR events assume either no failure in offsite power, or a complete and instantaneous loss of offsite power; no UFSAR events assume a degraded voltage condition. In the event of a loss of offsite power, a separate set of relays, the 4160 volt Emergency Bus Undervoltage (Loss of Voltage) relays automatically transfer emergency safety feature electrical loads to the onsite emergency diesel generators in sufficient time to provide for safe reactor shutdown and to mitigate the consequences of a design basis accident such as a LOCA. The TS AV and trip setpoints for the 4160 volt Emergency Bus Undervoltage (Loss of Voltage) relays are unchanged by this request.

Thus, the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum AV is not a limiting safety system setting for a variable on which a safety limit (SL) has been placed as discussed in 10 CFR 50.36(d)(1)(ii)(A).

NRC Question 3:

For setpoints that are determined to be SL-related: The Nuclear Regulatory Commission (NRC) letter to the Nuclear Energy Institute SMTF [Setpoint Methods Task Force] dated September 7, 2005 (Agencywide Documents Access and Management System Accession No. ML052500004), describes setpoint-related TS (SRTS) that are acceptable to the NRC for instrument settings associated with SL-related setpoints. Specifically: Part "A" of the Enclosure to the letter provides limiting condition for operation notes to be added to the TS, and Part "B" includes a check list of the information to be provided in the TS Bases related to the proposed TS changes.

a. Describe whether and how you plan to implement the SRTS suggested in the September 7, 2005, letter. If you do not plan to adopt the suggested SRTS, then explain how you will ensure compliance with 10 CFR 50.36 by addressing items 3b and 3c, below.
b. As-Found Setpoint evaluation: Describe how surveillance test results and associated TS limits are used to establish operability of the safety system. Show that this evaluation is consistent with the assumptions and results of the setpoint calculation methodology. 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 criteria for determining operability of the instrument being tested are located in a document other than the TS (e.g. plant test procedure) explain how the requirements of 10 CFR 50.36 are met.

c. As-Left Setpoint control: Describe the controls employed to ensure that the instrument setpoint is, upon completion of surveillance testing, consistent with the assumptions of the associated analyses. If the controls are located in a document other than the TS (e.g. plant test procedure) explain how the requirements of 10 CFR 50.36 are met.

FPL Energy Duane Arnold Response:

As discussed in NRC Question 2 above, FPL Energy Duane Arnold asserts that the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum allowable value is not a limiting safety system setting for a variable on which a safety limit (SL) has been placed as discussed in 10 CFR 50.36(d)(1)(ii)(A), i.e., not "SL-Related." Therefore, NRC Question 3 is not applicable.

NRC Question 4:

For setpoints that are not determined to be SL-related: 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 process (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.

FPL Energy Duane Arnold Response:

The 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum and minimum allowable values are controlled by DAEC Technical Specifications in Table 3.3.8.1-1. As such, DAEC TS require they be functionally tested on a 31 day frequency, calibrated on a 12 month frequency and a logic system functional test performed on a 24 month frequency. The functional tests and calibration are performed via Surveillance Test Procedures (STPs). STPs are controlled by TS Section 5.4.1.a and non-compliance is subject to a Notice of Violation.

The 4160 volt Emergency Bus Undervoltage (Degraded Voltage) calibration procedure gives the following general instructions:

- Steps marked with a "TS" immediately to the right of the step signoff line are required by Technical Specifications. If these steps do not meet their acceptance criteria or cannot be performed, a NRC reportable condition may exist and shall be reported to the Control Room Supervisor (CRS) immediately.
- If any equipment or components are observed to be in a state of disrepair during the performance of this STP, appropriate corrective maintenance shall be initiated.
- The CRS shall be notified immediately and the appropriate Limiting Conditions for Operation section of Technical Specifications referred to whenever problems are encountered during the performance of this STP.
- An Action Request (AR) should be completed for any problems encountered with "TS" marked steps during the performance of this test/inspection. [An AR is a means of entering problems, concerns, issues and events into the Corrective Action Program.]

The calibration procedure identifies the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay as-found trip setting with a "TS." As described in the STP general instructions listed above, this identifies the as-found setting to be a TS required setpoint. If the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay trip is found to be outside the allowable voltage range of ≥ 3780V and ≤ 3822V, the procedure requires notification of the Control Room Supervisor who will determine whether TS Operability and NRC Reportability criteria are met and initiate Corrective Actions, such as recalibration, repair or replacement, accordingly. Such a finding would also prompt entry in LCO 3.3.8.1 Condition B for one or more Function 2 Loss of Power Instrumentation channels inoperable. Unplanned LCO entries are also entered into the Corrective Action Program.

The calibration procedure also identifies the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay as-left trip setting to be a TS required setpoint. The as-left voltage range is limited to within +/- 7 volts of the trip setpoint and results in an as-left voltage range that is narrower than the AV range as follows:

Nominal Trip Setpoint	Tolerance	Minimum	Maximum
3797.5 VAC	As Found/AV	3780 VAC	3822VAC
3797.5 VAC	As Left	3790.5 VAC	3804.5 VAC

If, during the calibration, the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay trip setting cannot be established within the As-left voltage range of ≥ 3790.5 V and ≤ 3804.5 V, the procedure requires notification of the Control Room Supervisor who will, as detailed above, take appropriate actions regarding TS Operability, NRC Reportability, Corrective Actions and LCO entry.

NRC Question 5:

The LAR in Exhibit A, Section 3.2, DAEC Licensing Basis, states, "The maximum allowable voltage for the 4160 volt Emergency Bus Undervoltage relays does not constitute a Limiting

Safety System Setting (LSSS)..." Provide justifications for this statement, specifically considering the requirements for LSSS specified in 10 CFR 50.36(d)(ii)(A).

FPL Energy Duane Arnold Response:

10CFR 50.36(d)(ii)(A) states: "Limiting safety system settings for nuclear reactors are settings for automatic protective devices related to those variables having significant safety functions." As discussed in FPL Energy Duane Arnold response to question 2 above, the purpose of the maximum AV for the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relays is to ensure that potential transients on the offsite power grid and bus voltage dips due to the starting of large motors will not cause a spurious transfer from the offsite power source to the onsite emergency diesel generators. The maximum AV for these relays prevents undesirable spurious transfers of loads to the onsite emergency diesel generators when grid voltages are adequate to support operation of the plant. As noted in our response to question 2 above, it is the 4160 volt Emergency Bus Undervoltage (Loss of Voltage) instrumentation, not the degraded voltage instrumentation, that is credited in the UFSAR evaluation of design basis accidents and transients. As such, the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum AV does not provide any safety significant function relied upon for safe reactor shutdown or to mitigate the consequences of a design basis accident. Thus, the 4160 volt Emergency Bus Undervoltage (Degraded Voltage) relay maximum allowable value is not an LSSS as defined in 10 CFR 50.36(d)(ii)(A).