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FPLEnergy.

Duane Arnold Energy Center

January 31, 2007

NG-07-0063

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
11555 Rockville Pike
Rockville, Maryland 20852

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

Response to Request for Additional Information Regarding Resolution of Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power"

References:
1. Nuclear Regulatory Commission (NRC) Generic Letter 2006-02, "Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated February 1, 2006
2. FPL Energy letter L-2006-073, "NRC Generic Letter 2006-02 60-Day Response," dated April 3, 2006
3. NRC letter, "Request for Additional Information Regarding Resolution of Generic Letter (GL) 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated December 5, 2006
4. NRC letter, "Revised Response Date for Request for Additional Information Regarding Resolution of Generic Letter (GL) 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power," dated December 13, 2006

In response to Generic Letter 2006-02 (Reference 1), FPL Energy Duane Arnold provided written response by letter dated April 3, 2006 (Reference 2).

In Reference 3, the NRC transmitted six requests for additional information (RAIs) for resolution of GL 2006-02 and a matrix listing the applicable RAI questions for each specific plant. Reference 4 requested that the RAI responses be provided to the NRC by January 31, 2007.

The enclosure to this letter provides FPL Energy Duane Arnold responses to RAI questions 2 through 5 for DAEC as requested by the NRC in Reference 3.

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RAI question 3 requests information about analyses, procedures, and activities concerning grid operation of which FPL Energy Duane Arnold does not have first hand knowledge and of which are beyond the control of FPL Energy Duane Arnold. In providing information responsive to RAI question 3, FPL Energy Duane Arnold makes no representation as to its accuracy or completeness.

This letter makes no new commitments nor changes to any existing commitments. If you have any questions, please contact Steve Catron at (319) 851-7234.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on the 31st day of January, 2007.

Gary Van Middlesworth
Site Vice President, Duane Arnold Energy Center
FPL Energy Duane Arnold, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, DAEC, USNRC
Senior Resident Inspector, DAEC, USNRC

Response to Request for Additional Information (RAI) Regarding Resolution of Generic Letter 2006-02, Grid Reliability and the Impact on Plant Risk and the Operability of Offsite Power

NRC RAI Question 2

Your response to question 2(f) did not identify the actions that would be taken if the online grid analysis tool (software program) that you rely upon as an input for offsite power operability became unavailable. If the online grid analysis tool that you use to determine if the offsite power is inoperable becomes unavailable, what actions would you take to determine if post-trip voltages will be acceptable, including any other compensatory actions, until the post-trip voltage is confirmed to be adequate?

As an example, the actions may include reliance on a backup (third party's) real-time contingency analysis or similar program, or relying on a grid planning study to confirm that the original assumptions bound the existing grid conditions.

FPL Energy Duane Arnold Response to Question 2

As stated in our response to 2(f), Procedure ACP 101.16 "Midwest ISO [Midwest Independent System Operator or MISO] Real-Time Operations Communication and Mitigation Protocols for Nuclear Plant/Electrical System Interfaces" states: "Should the Transmission Operator lose its ability to monitor or predict the operation of the transmission system affecting off-site power to the Nuclear Plant, the Transmission Operator shall notify the Midwest ISO, validate Midwest ISO's ability to monitor and predict the operation of the transmission system and then communicate to the Nuclear Plant."

Furthermore, as stated in 2(f) of our response to the Generic Letter, MISO provided the following information;

> "Should Midwest ISO lose its ability to monitor or predict the operation of the transmission system affecting off-site power to the Nuclear Plant, MISO shall notify the Transmission Operator.
>
> The Midwest ISO has developed Abnormal Operating Procedures (AOP) to guide its transmission system operation for failures of different components of analytical and communication tools. For loss of the MISO RTCA [Real-time Contingency Analysis], Midwest ISO will consider the results of the local transmission operator's analytical tools. For loss of both sets of tools, Midwest ISO Operating Engineer will attempt to use off-line power flow tools to replicate operating conditions and predict contingent operation."

Based on the above, a procedure is in place such that a loss of the local transmission operator's analytical tool will result in use of the MISO tool.

Conversely, a loss of the MISO tool will result in use of the local transmission operator's analytical tool.

In the event of the loss of both tools, MISO Procedures direct the MISO Operating Engineer to use off-line power flow tools to replicate operating conditions and predict contingent operation.

Therefore, procedures are in place such that the Duane Arnold Energy Center (DAEC) will continue to be notified of offsite power conditions that may affect operability even in the event of the loss of the Transmission Operator and/or MISO analytical tools.

NRC RAI Question 3

Your response to question 2(g) indicates that you have not verified by procedure the voltages predicted by the online grid analysis tool (software program) with actual real plant trip voltage values. It is important that the programs used for predicting post-trip voltage be verified to be reasonably accurate and conservative. What is the range of accuracy for your GO's [Grid Operator's] contingency analysis program? Why are you confident that the post-trip voltages calculated by the GO's contingency analysis program (that you are using to determine operability of the offsite power system) are reasonably accurate and conservative? What is your standard of acceptance?

FPL Energy Duane Arnold Response to Question 3

The local (American Transmission Company or ATC) and regional (MISO) grid operators' contingency analysis tools obtain data from thousands of data points. Contingency analysis is then performed via digital hardware, firmware and software. Per ATC, a range of accuracy is indeterminate for such a digital system.

FPL Energy Duane Arnold is currently working with the local and regional grid operators to ensure notification if either a planned outage or unplanned trip of grid equipment produces actual DAEC switchyard voltages that fall outside the predicted values. When the grid operator notifies FPL Energy Duane Arnold of such, it will be entered into the DAEC Corrective Action Program for appropriate review.

The contingency tool used by the local grid operator is fully within the purview of ATC. ATC has expressed confidence in their post trip voltage calculations based on experience with scheduled and forced outages across their transmission system. Both the local and regional grid operators have gained considerable operating experience from using the contingency analysis program to plan system outages and to operate a reliable transmission system on a day-to-day basis.

Based on the above information, FPL Energy Duane Arnold is confident that the post-trip voltages calculated by the grid operators' contingency analysis programs are reasonably accurate and conservative.

NRC RAI Question 4
In response to questions 3(a) you did not identify the loss of other critical transmission elements that may cause the offsite power system (OSP) to degrade, other than the loss of the nuclear unit. If it is possible for specific critical transmission elements (such as other generators, critical transmission line, transformers, capacitor banks, voltage regulators, etc.) to degrade the OSP such that inadequate post-trip voltage could result, have these elements been included in your N-1 contingency analysis? When these elements are included in your GO's contingency analysis model and failure of one of these transmission elements could result in actuation of your degraded voltage relay, is the offsite power declared inoperable? If not, what is your basis for not declaring the offsite power inoperable?

FPL Energy Duane Arnold Response to Question 4
FPL Energy Duane Arnold's grid reliability study included the effects of trips of the DAEC with contingencies for 68 transmission lines and 16 transformer outages as required by Mid-Continent Area Power Pool (MAPP)/Mid-America Interconnected Network (MAIN) for Iowa grid reliability and stability studies. The study concluded that all voltages at DAEC remain within the acceptance limits. Therefore, the DAEC offsite circuits have been analyzed to demonstrate that a trip of the DAEC turbine/generator does not lead to grid instability under the most probable "N-1" contingencies. As such, only a condition where the trip of the DAEC itself could lead to degraded switchyard voltage would cause the Technical Specification action for offsite circuits to be entered.

NRC RAI Question 5
Certain regions during certain times of the year (seasonal variations) experience higher grid stress as is indicated in Electric Power Research Institute (EPRI) Report 1011759, Table 4-7, Grid LOOP [Loss of Offsite Power] Adjustment Factor, and NRC NUREG/CR-6890. Do you adjust the base LOOP frequency in your probabilistic risk assessment (PRA) and Maintenance Rule evaluations for various seasons? If you do not consider seasonal variations in base LOOP frequency in your PRA and Maintenance Rule evaluations, explain why it is acceptable not to do so.

FPL Energy Duane Arnold Response to Question 5
Seasonal change, by itself, is not used as a criterion for adjusting parameters in the FPL Duane Arnold risk management tool (ORAM-Sentinel) to account for higher likelihood of the LOOP initiating event. Rather, ORAM-Sentinel allows the normal risk color to be elevated when switchyard activities or external conditions (i.e., impending severe weather or concerns about grid stability) are such that a higher than normal potential for losing offsite power is deemed to exist. ORAM-Sentinel contains toggle buttons representing "higher risk evolution" for various initiating events, including LOOP. This feature in ORAM-Sentinel allows scheduling and operations personnel to account for adverse conditions relating to switchyard and

grid stability, and to make appropriate adjustments to the conduct of planned and emergent maintenance work as necessary.

Guidance on the use of "higher risk evolution" buttons is contained in a work planning guideline which focuses on risk management while operating. Use of the button representing LOOP is recommended when multiple work activities are ongoing in the switchyard, when a potential for severe weather is anticipated, and when grid stability concerns exist as communicated by the transmission operator. Finally, FPL Energy Duane Arnold personnel manage the potential risk of LOOP events by scheduling planned maintenance of equipment relied upon for mitigating LOOP events during mild weather portions of the year. Such equipment includes the emergency diesel generators, the startup and standby transformers, the High Pressure Coolant Injection and Reactor Core Isolation Cooling high pressure injection systems, and the 125 and 250 volt batteries.

Although LOOP frequency in the DAEC Probabilistic Risk Assessment is not adjusted based on postulated seasonal effects, consideration of severe weather as well as factors that could affect offsite power supply provide an effective qualitative evaluation feature in the risk management tool.