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Director
Division of Systems Analysis and Regulatory Effectiveness
Office of Nuclear Regulatory Research
Mail Code 10 E32
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: Final Report: "Operating Experience Assessment – Effects of Grid Events on Nuclear Power Plant Performance"

Dear Mr. Eltawila:

We appreciate the opportunity to review and comment on the subject report. It appears the principle objectives of the NRC assessment of losses of offsite power (LOOP) are twofold:

1. to determine the extent to which nuclear power plant (NPP) trips are causing losses of offsite power (LOOP) and conversely, the extent to which LOOP are causing plant trips; and

2. to determine the extent to which deregulation in the electric power industry is impacting plant trips and LOOP.

The assessment focused on two distinct periods of time: before deregulation (1985-1996) and after deregulation (1997-2001).

Although we recognize the merits of periodically conducting such assessments of transmission grid performance and associated impacts on nuclear power plant performance, it is imperative that such assessments apply recognized methodologies and statistically valid bases especially when making conclusions. The conclusions in the report offer no direct insights on the impact of deregulation on LOOP or nuclear power plant performance. No data is provided to identify which events included in the study occurred at plants, switchyards or transmission grids that were subject to deregulation. Not all power generation and transmission systems were deregulated in 1997 and clearly not all of these systems are subject to deregulation today. Furthermore, not all electric utilities have decentralized in divesting transmission services. Any conclusion regarding the impact of deregulation cannot be substantiated without this important information.

The report acknowledges a deviation from past studies in the methodology for characterizing grid events. The methodology combines plant-centered events and switchyard events into the grid event category even though the initiating element was not at the grid. For example, in many of the events treated in this manner, plant electrical equipment is considered part of the transmission grid rather than the plant. As an example, refer to event numbers 21, 22, 36, 51, 55, 60, and 62. Similarly, other events whose cause was attributed to a malfunction in the plant switchyard are categorized as grid events. We believe that such characterization of events will skew the results and lead to incorrect conclusions. We believe that an event should not be considered as grid initiated, if the initiating device, system, etc. would not exist if the plant did not exist.

Of particular concern is the treatment of emergency diesel generator (EDG) starts and load runs. The report treats the EDG actuation as a LOOP and that LOOP duration is predicated on how long the EDG operated rather than how long offsite power was unavailable. The Electric Power Research Institute (EPRI) conducts annual assessments of losses of offsite power. A recent update included all events through 2002. We believe this would be a useful reference for NRC consideration. In preparing its annual loss offsite power update, EPRI determines how long offsite power is truly unavailable for each loss of offsite power event. In many events, backup offsite power is available but is not needed and not used. For example, at most plants, following the loss of offsite power to the safeguard buses, it is the plant management's decision to power these buses from the EDGs, even though a totally acceptable option would be to transfer to an available alternate offsite source. If powering these buses from the EDGs is the selected first choice, it is often possible to transfer the safety buses quickly from normal or backup offsite power if necessary. However, plant management frequently finds it more prudent to stay on the EDGs for a time and pursue more urgent tasks such as stabilizing plant systems.

The report indicates that the number of LOOP events is decreasing, but the median duration is increasing. Although this statement is true, it can be misleading as well. There have only been 4 long LOOP events since the beginning of 1998. Two weather-related events occurred in 1998, one lasted 8 hours and one lasted 23:03 hours. There was a non-weather related LOOP in 1999 that lasted 12:00 hours and a non-weather related LOOP in 2000 which lasted 33:34 hours. What has changed is the frequency of plant-centered short duration LOOP, such that the total LOOP frequency for a 5-year moving average has decreased from 0.056 LOOP per generating unit year in 1993 to 0.0014 LOOP per generating unit year in 2002. This decrease is explained by the fact that during the years 1998-2002 there have been only 7 losses of all offsite power: 5 of these lasted longer than 4 hours, and 4 longer than 8 hours. The more robust grids and switchyards reduced the incidents of minor, short duration LOOPS. What remains are the LOOP events associated with weather and major equipment failures.

The fact remains that the number of short, plant centered LOOP has gone down substantially, not that the number of longer duration LOOP has increased. Obviously if the frequency of short duration LOOP decreases, the median LOOP

duration increases. This report should include a more comprehensive discussion of such statistics.

We are also concerned with the treatment of the probability of a LOOP as a consequence of a reactor trip. The report contains a number of generalized conclusions that are based upon questionable statistical techniques; for example, it states that the probability of a LOOP given a trip has increased by a factor of 5 (from 0.002 to 0.01). The actual analysis in the report suggests that the overall probability has increased from 0.002 to 0.0045, a factor of 2.250. However, this is based upon 2 post-deregulation events. Statistically, it is not appropriate to draw conclusions from such a small sample size. According to the event descriptions, one of the two events was actually an operational problem that does not appear to be related to deregulation or grid conditions. Thus, with only one event, the probability is essentially unchanged (0.002 to 0.0023). The factor of 5 appears to be based upon an unspecified culling of the data that is restricted to summer operations. This undermines the validity of the statistics.

Lastly, we believe these concerns must be addressed in order for this report to provide useful and valid information relative to the impact of grid events attributed to deregulation. There are a number of assumptions and concluding statements made in the report that are derived from the methods for which we have expressed concerns as noted above.

We would be pleased to meet with NRC staff to discuss this report in further detail. In addition, we request that the staff consider a collaborative effort with industry to conduct an improved assessment on the relationship between deregulation, grid events and nuclear power plant safety. I will contact you to schedule a meeting.

Sincerely,

Alexander Marion

c: Mr. William S. Raughley, USNRC
Mr. Frank Rahn, EPRI