

November 15, 2001

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SUBJECT: SUMMARY OF AUGUST 30, 2001, PUBLIC TELECONFERENCE
WITH NUCLEAR ENERGY INSTITUTE (NEI), BOILING WATER
REACTOR OWNERS' GROUP (BWROG) AND OTHER
INTERESTED STAKEHOLDERS REGARDING POTENTIAL
CHANGES TO 10 CFR 50.46 (LOCA-LOOP REQUIREMENT)

The NRC staff held a public teleconference on August 30, 2001, in order to discuss BWROG interest in the staff's recommended changes to 10 CFR 50.46, specifically changes to the current requirement to postulate a loss of offsite power when performing thermal-hydraulic calculations to demonstrate meeting the emergency core cooling system (ECCS) acceptance criteria stipulated in 10 CFR 50.46. Terry Rieck, Exelon Corporation, led the discussions, which focused on the following five areas:

1. Overview of loss of coolant accident (LOCA)-loss of offsite power (LOOP) option (industry perception)
2. BWROG interest/motivation
3. Data gathering
4. Single failure criterion (tie to LOCA-LOOP)
5. Future plans

A summary of the discussions on each of these areas is provided below.

Overview of LOCA-LOOP Option (Industry Perception)

T. Rieck indicated that the industry perception of the LOCA-LOOP option from SECY-01-0133 was that if a set of LOCAs exists whose collective frequency when combined with the conditional probability of losing offsite power is below $10^{-6}/\text{yr}$, a coincidental LOOP would no longer have to be postulated as part of the design basis for this set of LOCAs. The NRC staff confirmed this understanding. The purported safety benefit of such a change would be that

diesel generator start times, and some ECCS valve stroke times, could be relaxed leading to an increase in equipment reliability (due to decreased wear and tear, etc.). Industry identified areas of potential unnecessary burden reduction as (1) increased analytical margin in ECCS thermal-hydraulic calculations, (2) reduced diesel generator (DG) and valve maintenance costs due to relaxed DG start times and ECCS valve stroke times, (3) relaxed DG redundancy requirements and (4) reduced DG loading. One BWROG representative indicated that the only physical changes that would be made at the plant would be with respect to motor-operated valves (MOVs) covered by Generic Letter (GL) 89-10. Another BWROG representative stated that even though some plants have already done analyses that would allow them to extend their DG start times from 10 seconds to something on the order of 20 seconds, no plants have pursued this due to the cost for new controllers, etc. Instead, these plants hold these studies in reserve, to be used in case a technical specification limit is exceeded. It was also stated by the BWROG that as an "off-the-cuff" guess, if the coincident LOOP assumption can be eliminated for all breaks greater than something on the order of 6-8 inches, then DG start times can be extended by a useful amount. However, if the LOOP assumption can only be eliminated for breaks greater than something on the order of 12-14 inches, the potential resulting increase in DG start time would probably only be a few seconds, and would not be worth pursuing.

It was noted that some issues that may need to be addressed as part of this effort include estimation of LOCA frequencies (including non-pipe-break sources of LOCAs and previous intergranular stress corrosion cracking [IGSCC] experience in BWR piping), conditional LOOP probabilities (i.e., updating the data in NUREG/CR-6538), delayed LOOP, the need for a living probabilistic risk assessment (PRA) or PRA update to demonstrate that there is no significant increase in core damage frequency (CDF), and grid stability (particularly in light of recent utility deregulation).

The staff noted that for calculating conditional LOOP, care will be given in crediting features that are out of the licensee's control (e.g., voltage control on the transmission grid), since they may change in the future. Also, the staff noted that in performing risk-informed evaluations, the scope extends beyond just design basis accidents (DBAs), i.e., it must be demonstrated that the ultimate plant changes would not adversely impact other risk-significant accidents.

BWROG Interest/Motivation

The BWROG offered the following perspectives:

- (1) The need to consider coincident LOOP for large-break LOCAs (LBLOCAs) results in a need for quick ECCS pump actuation, which, in turn, requires fast DG start. If the frequency of LBLOCAs is low enough, the coincident LOOP can be ignored; and DG and pump start times, pump flow requirements, and/or ECCS MOV stroke times (resulting from GL 89-10) may be able to be relaxed, which could lead to an increase in equipment reliability. Also, it may be possible to reduce DG load.
- (2) For small-break LOCAs (SBLOCAs), the coincident LOOP probably cannot be eliminated; however, since the reactor is not depressurizing rapidly, steam-driven pumps, diesel-driven pumps (if any), or other non-safety-related sources of water can be used. Therefore, even if coincident LOOP must be assumed, the DGs still may not need to start quickly, nor would as much pump flow be required.

Industry also indicated interest in risk-informed changes to the ECCS performance calculations (e.g., using best estimate analysis without uncertainty propagation) for low frequency combinations of events. The staff responded that this was being considered as part of the staff's longer term feasibility assessment of additional changes to 10 CFR 50.46.

Data Gathering

Industry stated a desire to be able to provide public comment on the revision to NUREG/CR-5750 or whatever data source is used for LOCA frequencies for this project. The BWROG believes that twice as much credit should be given for IGSCC mitigation efforts than is credited in the current NUREG/CR-5750. The BWROG has recently completed a study on IGSCC mitigation, and could provide this to the NRC in a few weeks.

Regarding the conditional probability of a LOOP, the staff is undertaking an effort to update the data from NUREG/CR-6538. The Electric Power Research Institute (EPRI) has performed a series of studies that cover LOOP data up through 1999. They have also completed preliminary analysis for data through March 2001. The EPRI report covering the 2000/2001 LOOP data is expected to be published in very early 2002. These reports also include valuable insights from plant personnel. Industry has offered to make these reports and data available to the NRC in the near-term. In response to a question from the staff regarding the availability of plant information or analysis pertaining to plant performance under degraded grid voltage conditions, the EPRI representative indicated that there is very little information available.

Single Failure Criterion (Tie to LOCA-LOOP)

This issue was not discussed extensively. It was noted that the most likely unnecessary burden benefit associated with replacing the single failure criterion in General Design Criterion (GDC) 35 with an ECCS reliability criterion is a potential increase in allowed outage time for some ECCS equipment. One of the principal issues that needs to be resolved is to what extent should credit be given to non-ECCS systems (e.g., reactor core isolation cooling [RCIC]). Also, consideration must be given to whether the Maintenance Rule is adequate for ensuring an acceptable level of performance for all of the equipment credited in the analysis.

Future Plans

The staff and industry agreed to hold a public meeting within a few weeks to further extend these discussions. At the upcoming meeting, it is anticipated that the staff would provide an update of its work on potential changes to 10 CFR 50.46 and related regulations, specifically with respect to the ECCS reliability requirements (i.e., LOCA-LOOP and the single failure criterion). It is anticipated that industry would provide the status and/or results of their information gathering activities, particularly with respect to IGSCC and non-pipe-break LOCAs, as well as the EPRI work on conditional LOOP. Industry and other stakeholders will also have the opportunity to provide the staff with any ideas they have regarding the approach for and uses of risk-informing the single failure criterion.

The teleconference concluded with the general agreement that the call was mutually beneficial.

The stakeholders developed a better understanding of the staff's activities for risk-informing 10 CFR 50.46, and the staff developed a better understanding of industry's interest in, and possible support for, these activities.

Attachments:

1. List of Participants

Project No. 689

cc: See next page

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