

September 26, 2003

Mr. Kenneth Putnam, Chairman  
BWR Owners Group  
Nuclear Management Company  
Duane Arnold Energy Center  
3277 DAEC Rd.  
Palo, IA 52324

SUBJECT: BOILING WATER REACTOR STEAM DRYER INTEGRITY

Dear Mr. Putnam:

On August 21, 2001, GE Nuclear Energy (GENE) issued Services Information Letter (SIL) No. 644, "Boiling Water Reactor Steam Dryer Integrity," to the licensees of nuclear power plants with boiling water reactor (BWR) nuclear steam supply systems designed by General Electric (GE). The SIL described an event at a BWR/3 that involved the failure of a steam dryer cover plate and the generation of loose parts. In response to a second steam dryer failure at the same plant approximately one year later, GENE on September 5, 2003, issued Supplement 1 to SIL No. 644. Supplement 1 described the second failure of a BWR/3-style steam dryer that occurred earlier in 2003 and updated and expanded the scope of the recommendations initially provided in SIL No. 644 on steam dryer integrity to all GE-designed BWR nuclear power plants if currently operating, or planning to operate, above their original licensed thermal power (OLTP).

During a July 25, 2003, meeting with the Boiling Water Reactors Owners Group (BWROG) and GENE on steam dryer failures, the BWROG stated that the steam dryer in a BWR does not perform a safety-related function. The NRC staff agreed. However, the NRC staff noted that the steam dryer must maintain its structural integrity such that an operational problem is not caused, or safe shutdown of the reactor is not prevented, by loose steam dryer parts in the reactor vessel or main steam lines (MSLs) leading to the turbine generator. Therefore, the NRC staff requested that the BWROG meet with the staff as soon as practicable after GENE had issued the revised SIL to discuss the recommendations in Supplement 1 and the response of BWR licensees to those recommendations. The NRC staff had requested that this meeting be held in the September 2003 timeframe.

The NRC staff reviewed the SIL and conducted a teleconference with you on September 17, 2003, to discuss the SIL and future actions. During the teleconference, we noted that the recommendations in SIL No. 644, Supplement 1 represent a good start in addressing the steam dryer integrity issue. In addition, we stated that the staff would like to discuss several aspects of these recommendations with the BWROG in a future meeting. To assist the BWROG in preparing for this public meeting, the staff's comments on SIL No. 644, Supplement 1 are summarized as follows:

1. SIL No. 644, Supplement 1 does not appear to address all of the potential factors that could affect the susceptibility of a steam dryer to failure during operation of a BWR above the OLTP. For example, in addition to steam dryer design and maximum MSL

steam velocity discussed in the SIL, the extent of the power level change from the OLTP, or the change in the MSL steam velocity, might also influence the susceptibility of a particular steam dryer to failure. Further, less stringent recommendations related to steam dryer integrity might be permissible where a BWR has only implemented or will only implement a minimal measurement uncertainty recapture power uprate. Please be prepared to discuss your criteria for establishing susceptible plants and the bases.

2. The recommendations in SIL No. 644, Supplement 1 focus on identifying steam dryer failure, such as by increased moisture content in the MSL steam flow and visual inspection of the steam dryer for cracks. However, these recommendations will only identify future failures of steam dryers after the fact. We believe that additional effort should be made to provide reasonable assurance that future steam dryer failures are highly unlikely, through such means as predictive analyses or instrumentation.
3. The basis for the applicability of internal steam dryer inspection recommendations in SIL No. 644, Supplement 1 only to the BWR/3 steam dryer design with internal braces is not apparent in that experience has suggested that cracking might initiate on the interior surface of the steam dryer.
4. SIL No. 644, Supplement 1 recommends the performance of "best effort" VT-1 visual inspections of the applicable steam dryers during an upcoming refueling outage. Although steam dryers in BWRs might not be subject to ASME Code inservice inspections, the intent of SIL No. 644, Supplement 1 with respect to satisfying the Code provisions in performing VT-1 visual inspections of steam dryers should be clarified.
5. SIL No. 644, Supplement 1 recommends inspection of BWR/4 and later steam dryer designs prior to initial operation above the OLTP, or within the next two scheduled refueling outages if already operating above the OLTP. This recommendation has the potential to allow the steam dryer at some BWRs operating above the OLTP not to be inspected for almost 4 years. Please discuss your basis for the timeliness of this recommendation.
6. SIL No. 644, Supplement 1 discusses recent steam dryer failures at one BWR in the United States. Recommendations to address steam dryer integrity should also incorporate applicable experience from other BWRs in the U.S. and in other countries. Please be prepared to discuss significant steam dryer failures in the U.S. and overseas.
7. With regard to power uprates, please be prepared to discuss what actions you intend to propose for BWRs planning to apply for future power uprates (i.e., measurement uncertainty recapture, stretch, and extended).
8. Please be prepared to discuss what actions not addressed in SIL No. 644, Supplement 1 should be taken for BWRs previously approved for power uprates.

The NRC staff is evaluating the development of an appropriate regulatory vehicle to ensure that all operational BWRs address the lessons-learned from the recent steam dryer failures and other applicable operating experience in a timely manner. As part of the upcoming public meeting, we request your assistance in providing the status of licensees' responses to

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SIL No. 644, Supplement 1 for each operational U.S. BWR, including the results of any recent steam dryer inspections. We also would like your views on an efficient and effective means for the NRC staff to monitor licensees' activities in response to SIL No. 644, Supplement 1 and to verify the completion of those activities.

Please contact me at 301-415-1445 to arrange the date for a public meeting to discuss the recommendations in SIL No. 644, Supplement 1 and the items noted above.

Sincerely,

**/RA/**

Alan B. Wang, Project Manager, Section 2  
Project Directorate IV-2  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Project No. 691

cc: See next page

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