



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
WASHINGTON, D.C. 20555-0001

EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
REGARDING CORE SPRAY INSPECTION PLAN FOR D3R14 REFUEL OUTAGE  
COMMONWEALTH EDISON COMPANY  
DRESDEN NUCLEAR POWER STATION, UNIT 3  
DOCKET NO. 50-249

1.0 INTRODUCTION

By letter dated October 3, 1996, Commonwealth Edison Company (ComEd, the licensee) submitted the core spray inspection plan for the Dresden Nuclear Power Station, Unit 3, upcoming D3R14 refuel outage. ComEd intends to implement the recommendations from the Boiling Water Reactor Vessel and Internals Project (BWRVIP) "BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (BWRVIP-18)," dated July 26, 1996, in the performance of internal core spray examinations and evaluations at Dresden, Unit 3. ComEd believes that the implementation of an inspection plan based upon these recommendations will satisfy the IE Bulletin 80-13, "Cracking In Core Spray Spargers," closeout commitment regarding the performance of core spray sparger examinations at each refuel outage.

2.0 EVALUATION

ComEd developed the internal core spray inspection plan in accordance with Section 3, Inspection Strategy, of BWRVIP-18. This section provides specific inspection recommendations for both baseline inspections and reinspection of piping locations, core spray spargers, hidden welds, piping and sparger surfaces away from the welds, piping and sparger brackets, and any repairs that might be in place. ComEd intends to perform the baseline inspection of these locations during the D3R14 refuel outage. The NRC staff notes that a safety evaluation report on BWRVIP-18 has not been completed at this time. The NRC staff is currently working on resolution of some outstanding issues with the BWRVIP on this document. However, these issues should not prevent licensees from following the guidance in BWRVIP-18 with the understanding that the NRC staff has not issued final approval of the guidance.

The BWRVIP-18 recommendations for the baseline inspection of the core spray spargers is discussed in Section 3.2.3, Sparger Locations. This section divides nuclear power plants into two types, geometry-tolerant plants and geometry-critical plants. The BWRVIP-18 defines these plant types as follows:

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Geometry-tolerant plants: These are plants where it has been shown that post-loss-of-coolant accident (LOCA) steaming of the water at two-thirds core height is sufficient to meet fuel safety limits, so spray distribution per the design is not essential. For such plants, it is only necessary to deliver core spray water inside the shroud to maintain two-thirds core coverage.

Geometry-critical plants: These are plants where post-LOCA steaming is not sufficient, so maintaining sparger geometry is critical to assure that the analyzed minimum spray flow rate into any given fuel bundle is accomplished according to the design.

ComEd has determined that Dresden, Unit 3, is a geometry-tolerant plant because the Dresden, Unit 3, LOCA analysis does not rely upon assumptions related to the sparger spray distribution. The LOCA analysis for Dresden, Unit 3, is performed using an NRC-approved Siemens Power Corporation (SPC) methodology. According to SPC, the amount of cooling provided by the low pressure coolant injection (LPCI) system prior to core reflood is limited by countercurrent flow conditions and not by the core spray distribution. The spray heat transfer coefficients used by SPC are supported by tests with countercurrent flow conditions at the upper tie plate. Therefore, the SPC LOCA analysis methodology does not rely on any assumptions related to the LPCI flow distribution (Reference 3). Notwithstanding, the NRC staff contends that no reliance on cooling from LPCI spray distribution is based on the assumption that the jet pumps are intact and, thus, core spray water will be delivered to the core prior to reflood. The NRC staff can not conclude that Dresden, Unit 3, is a geometry-tolerant plant at this time based on the status of the review of BWRVIP-18.

In addition, the NRC staff notes that the baseline inspection of the core spray spargers is less comprehensive for geometry-tolerant plants than geometry-critical plants. These differences involve the type of inspection that is performed at specific sparger locations, i.e., CS VT-1 versus VT-3 for locations S3 and SB, and the time when the reinspection is performed, i.e., one cycle for geometry-critical versus two cycles for geometry-tolerant. These issues are currently being discussed with the BWRVIP. Nonetheless, the NRC staff finds that the proposed baseline inspection of the core spray spargers provides an acceptable level of safety to that provided in past core spray sparger inspections under IE Bulletin 80-13.

On this basis, the NRC staff concludes that the proposed baseline inspection plan for the core spray spargers is acceptable. Resolution of the remaining issues with respect to BWRVIP-18 should also resolve the determination whether Dresden, Unit 3, is geometry-tolerant plant and the acceptable reinspection interval of the core spray spargers.

ComEd stated that if the installation of a new repair is required, then the repair will be baseline-examined in accordance with Section 3.2.4 of BWRVIP-18. In addition, if repairs are required, then the licensee should provide an evaluation of the repairs to the NRC staff prior to restart of the unit.

### 3.0 CONCLUSION

The NRC staff concludes that the proposed baseline inspection of the core spray spargers is acceptable for Dresden, Unit 3, D3R14 refuel outage. The resolution of the remaining issues related with the NRC staff review of BWRVIP-18 should also resolve Dresden, Unit 3, status as a geometry-tolerant plant and the appropriate reinspection interval of the core spray spargers. Based on the above, the NRC staff has concluded that there is reasonable assurance that plant operation in this matter poses no undue risk to the health and safety of the public.

The NRC staff is presently reviewing BWRVIP-18 and while the NRC staff has not identified any major deficiencies in the BWRVIP's technical assessment, neither has the NRC staff made a determination as to its acceptability. Therefore, the licensee should be advised that if concerns are found during the review of BWRVIP-18 and the licensee follows the BWRVIP-18 guidance, the NRC staff may request that the licensee also address these concerns from a plant-specific basis.

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Date: April 5, 1997

#### 4.0 REFERENCES

1. Perry, J. S., Commonwealth Edison Company, to USNRC, "Dresden Nuclear Power Station Unit 3 Submittal of Core Spray Inspection Plan for Dresden Unit 3," October 3, 1996.
2. Boiling Water Reactor Vessel and Internals Project (BWRVIP), "BWR Core Spray Internals Inspection and Flaw Evaluation Guidelines (BWRVIP-18)," EPRI TR-106740, July 1996.
3. Riddle, J.H., Siemens Power Corporation, to R.J. Chin, Commonwealth Edison Company, "Importance of LPCS Spray Distribution During a LOCA," August 30, 1996.