



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
RELATED TO THE USE OF DYNAMIC ROD WORTH MEASURING TECHNIQUE  
COMMONWEALTH EDISON COMPANY  
BYRON STATION, UNITS 1 AND 2; AND BRAIDWOOD STATION, UNITS 1 AND 2  
DOCKET NOS. STN 50-454, STN 50-455, STN 50-456, AND STN 50-457

1.0 INTRODUCTION

By letter dated February 8, 1999 (Reference 1), Commonwealth Edison Company (ComEd, the licensee) notified the NRC of its intention to use the Westinghouse developed Dynamic Rod Worth Measurement (DRWM) technique for future low power physics testing (LPPT) at Byron Station and Braidwood Station. Clarifying information was provided by ComEd in its letter of April 23, 1999 (Reference 2). The supporting analytical computations for this technique will be performed by ComEd.

NRC approval for use of DRWM in LPPT is based on using the technique as outlined in the Westinghouse report, Westinghouse Dynamic Rod Worth Measurement Technique, WCAP-13360-P-A, October 1998 (Reference 3). Reference 3 also includes the five criteria for a utility to use to demonstrate competencies to perform DRWM calculations.

2.0 EVALUATION

Compliance with the criteria listed in Reference 3 and notification of compliance with the criteria to the NRC, along with the date(s) of the intended first application of the codes to determine the DRWM physics constants for LPPT were the conditions specified for NRC approval of a utility's performance of its own physics calculations to support the use of DRWM. The NRC has the option to audit the utility's application of the program to ensure compliance. The five criteria are: (1) eligibility of codes for DRWM computations, (2) application of procedures to DRWM computations, (3) training and qualification of utility personnel, (4) comparison calculations for the DRWM technique, and (5) quality assurance and change control.

In the February 8, 1999 letter, the licensee stated how each of the criteria is to be met. ComEd will be using the same codes and procedures that were approved for Westinghouse use of DRWM. This satisfies Criteria 1 and 2. Westinghouse performed the first application of DRWM during the startup of Byron Station, Unit 2, Cycle 8 on May 18, 1998, and Braidwood Station, Unit 1, Cycle 8, on November 13, 1998. The analytical computations to support the DRWM were performed by Westinghouse. Station personnel have received training on procedures, the use of the Advanced Digital Reactivity Computer (ADRC) and application of the ADRC to perform LPPT using DRWM. The training was appropriate and satisfies Criterion 3. The February 8, 1999, letter also contained the DRWM measured and predicted rod worths by

ENCLOSURE

Westinghouse and ComEd, as well as the appropriate comparisons. These comparisons showed that ComEd met the acceptance criteria listed in Criterion 4 and, thus, Criterion 4 is satisfied. Application of the codes and procedures is controlled by the ComEd Quality Assurance Program which meets the requirements of 10 CFR Part 50, Appendix B. Furthermore, ComEd has a procedure for implementing changes in the methods and procedures and a provision for informing Westinghouse of problems or errors such that they can be resolved. Thus, ComEd has satisfied Criterion 5.

ComEd supplemented their submittal with a letter dated April 23, 1999 (Reference 2), which provided clarification and additional information. The licensee's letter stated that there are no significant differences between core loading schemes for the Byron and Braidwood Stations. Furthermore, the rod cluster control assembly bank layouts are identical at the Byron and Braidwood Stations. Therefore, the comparisons provided to satisfy Criterion 4 are appropriate for both the Byron and Braidwood Stations. Thus, the validation of the DRWM methodology for use by ComEd applies to both units at each station.

### 3.0 CONCLUSION

The staff has reviewed the referenced information and concluded that adequate justification has been provided to support the licensee's use of the DRWM technique at Byron and Braidwood Stations.

Principal Contributor: M. Chatterton

Date: November 8, 1999

#### 4.0 REFERENCES

1. Letter from R.M. Krich, ComEd, to U.S. NRC Document Control Desk, "Use of the Westinghouse Dynamic Rod Worth Measurement Technique," dated February 8, 1999.
2. Letter from R.M. Krich, ComEd, to U.S. NRC Document Control Desk, "Supplemental Information Regarding the Use of the Westinghouse Dynamic Rod Worth Measurement Technique," dated April 23, 1999.
3. WCAP-13360-P-A, Revision 1, Chao, Y.A., Easter, M.E., Hill, D.J., Chapman, D.M., Grobmyer, L.R., Hoerner, J.A., Westinghouse Dynamic Rod Worth Measurement Technique, dated October 1998.