

94-03

**OCONEE UNIT 3
DISLODGED STEAM GENERATOR TUBE PLUGS
JANUARY 10, 1994**

PROBLEM

FOURTEEN STEAM GENERATOR TUBE (SGT) PLUGS DISLODGED FROM STEAM GENERATOR. EIGHT OF THESE PLUGS WERE LOCATED IN REACTOR VESSEL.

CAUSE

B&W CREW FAILED TO RECOGNIZE THE IMPROPER FUNCTION OF THE PLUG INSTALLATION TOOL.

SAFETY SIGNIFICANCE

- **STEAM GENERATOR TUBES THAT BECAME UNPLUGGED COULD RUPTURE.**
- **POTENTIAL IMPACT ON RCS AND FUEL INTEGRITY.**

DISCUSSION

- **DURING THE REFUELING OUTAGE STARTED ON JANUARY 2, 1994, THE LICENSEE FOUND 8 STEAM GENERATOR TUBE PLUGS IN THE REACTOR VESSEL.**
- **THESE PLUGS WERE INSTALLED IN THE PREVIOUS OUTAGE IN AUGUST 1992.**
- **INSPECTION REVEALED 14 MISSING PLUGS IN THE "B" STEAM GENERATOR OUTLET SIDE. 14 OTHER PLUGS EXHIBITED BORON DEPOSITS.**

**CONTACT: T. KOSHY, DORS/OEAB
REFERENCE: DAILY CALLS WITH REGION**

**AIT: NO
SIGEVENT: NO**

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- **DISLODGED PLUGS AND THE QUESTIONABLE PLUGS WERE INSTALLED BY ONE B&W NIGHT SHIFT CREW USING THE "ROGER ROLL TOOL".**
- **THE PLUGS ARE MADE OF INCONEL 690.**
- **PLUGS ARE INSTALLED USING A ROLLING PROCESS UNTIL A DESIRED TORQUE IS REACHED. A CALIBRATED CLUTCH MECHANISM DISCONNECTS THE AIR SUPPLY TO TERMINATE THE TORQUING. THE TORQUE EXERTED ENSURES ADEQUATE EXPANSION OF THE PLUG IN THE SGT.**
- **RETROSPECTIVE REVIEW OF THE AUDIO / VIDEO TAPE INDICATED INADEQUATE TORQUING.**
- **THE TOOL HAD SATISFIED THE CALIBRATION REQUIREMENTS BEFORE AND AFTER INSTALLATION.**
- **THE CREW DID NOT IDENTIFY INADEQUATE TORQUING DURING THE IN-PROCESS INSPECTION OR IN THE INSPECTION OF DATA SHEETS THAT INDICATED A RELATIVELY SHORTER DURATION FOR TORQUING.**
- **THE LICENSEE CONTINUES TO LOOK FOR REMAINING PLUGS AND IS FORMULATING AN INSPECTION PLAN FOR ASSESSING RCS INTEGRITY.**

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GENERIC IMPLICATIONS

- THE QUESTIONABLE TOOL WAS USED AT 7 B&W PLANTS AND AT VC SUMMER.
- B&W HAS NOTIFIED ALL PLANTS AND CAUTIONED FOR INCREASED VIBRATIONS AND STEAM GENERATOR TUBE LEAKAGE.
- B&W REVIEW OF ALL APPLICABLE DOCUMENTATION WILL BE COMPLETED BY 1-21-94.
- AN ANALYSIS DONE FOR WESTINGHOUSE PLUGS IN 1984 FOR TMI CONCLUDED THAT THE PLUGS WOULD NOT AFFECT PLANT SAFETY.

FOLLOW UP

- A MANAGEMENT CONFERENCE CALL WAS CONDUCTED WITH THE LICENSEE AND B&W.
- A REGION-BASED SPECIALIST WAS SEND TO THE SITE. REGION IS MONITORING LICENSEE'S ACTIONS.
- AN INFO. NOTICE IS PLANNED.