Ref: 10CFR50.36(c)(2)

LOUISIANA POWER & LIGHT / WATERFORD 3 SES • P.O. BOX B • KILLONA, LA 70066-0751

MIDDLE SOUTH UTILITIES SYSTEM

June 20, 1988

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QA

U.S. Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
Reporting of Special Report

Attached is Special Report Number SR-88-005-00 for Waterford Steam Electric Station Unit 3. This Special Report is submitted per 10CFR50.36(c)(2) and Technical Specifications 3.3.3.3.a and 6.9.2.

Very truly yours,

N.S. Carns
Plant Manager - Nuclear

NSC/WEM:rk

Attachment

cc: R.D. Martin, NRC Resident Inspectors Office, INPO Records Center (J.T. Wheelock), E.L. Blake, W.M. Stevenson, D.L. Wigginton

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SPECIAL REPORT

SR-88-005-00

Inoperability of Passive Seismic Monitor Due to Excessive Heat and Vibration

INTRODUCTION

At 0641 hours on May 11, 1988, Waterford Steam Electric Station Unit 3 was in the refueling mode when Operations personnel declared Seismic Monitor SM-IYR-6021 inoperable. The monitor is a Triaxial Peak Accelerograph (TPA) located on 2A intermediate leg Reactor Coolant System (RCS) piping approximately five feet from the base of 2A Reactor Coolant Pump (RCP), and had been damaged due to normal RCS piping heat and vibration. This device is a passive recorder which provides local indication only and no control functions.

Since the monitor was inoperable for 30 days as of June 10, 1988, this ten day Special Report is submitted pursuant to Technical Specification 3.3.3.3.a and 6.9.2. The monitor will be relocated to a suitable location during the third refueling outage. Since another TPA located on Safety Injection Tank 1B provides a means for comparing the RCS response of an actual seismic event to the design analysis, there is no safety significance to this event.

NARRATIVE

At 0641 hours on May 11, 1988, Waterford Steam Electric Station Unit 3 was in the refueling mode when Operations personnel declared Seismic Monitor SM-IYR-6021 inoperable. Maintenance personnel discovered the monitor had been damaged when they attempted to perform procedure MI-3-342, "Triaxial Peak Accelerographs Channel Calibration", which satisfies Technical Specification (TS) surveillance 4.3.3.3.1. The plastic Lexan mounting board appeared to be deformed and embrittled and the mounting assembly was loose. The transverse and longitudinal accelerometers were found damaged. The probable cause of this failure was attributed to vibrations from RCP 2A and excessive heat.

This monitor is located on 2A intermediate leg Reactor Coolant System (RCS) piping approximately five feet from the base of Reactor Coolant Pump (RCP) 2A. There is another monitor of this type, SM-IYR-6020, located in containment on the Safety Injection Tank (SIT) 1B lifting lug. The monitors sense and record peak accelerations in the longitudinal, transverse, and vertical directions. They are self-contained passive devices requiring no internal or external power or control connections and provide local indication only. The purpose of the devices is to sense and record peak acceleration on three metal scratch plates for use in comparison of the RCS response to an actual seismic event with the design analysis. SM-IYR-6020 and 6021 satisfy Regulatory Positions C.1.a(1) and (2) respectively of Regulatory Guide 1.12, "Instrumentation for Earthquakes." The location of SM-IYR-6020, SIT 1B, is designated as "Reactor Equipment," and the location of SM-IYR-6021 is "a selected location on the reactor piping."

A review of past documentation revealed a history of problems with this monitor. Special Report (SR) 85-001 reported a failure of SM-IYR-6020 and 6021 on September 5, 1985. This was approximately six months after plant startup. At this time, SM-IYR-6020 was located on the Pressurizer Lifting Lug. The mounting block and all three sensor damping arms for SM-IYR-6020 were found to be melted away. Two of the damping arms were also broken, and the instrument was severely burned. One of the damping arms was found broken on SM-IYR-6021. An engineering evaluation described the mode of failure as due to excessive heat and vibration. However, the evaluation stated that SM-IYR-6021 had not been inspected since original installation and probably had become damaged due to high vibrations on RCP 2A which were corrected in March 1984 prior to plant startup. Further evaluation of documentation which was evidently not considered in the original evaluation revealed the monitor had been successfully calibrated on November 8, 1984; thus, both monitors had likely become damaged due to a combination of normal operating RCS heat and vibration.

Since the 1985 evaluation did not identify a problem with the location for SM-IYR-6021, this monitor was repaired, calibrated, and reinstalled by April 5, 1986, in the same location. Station Modification (SM) 1297 was initiated to relocate SM-IYR-6020 to the SIT 1B lifting lug. This monitor was calibrated and reinstalled in the new location by the end of the first refueling outage. This new location has proven to be satisfactory.

During the first refueling outage, SM-IYR-6021 was inspected, and the three sensors were found damaged. Although the work package attributed the cause of the damage as excessive vibration which occurred during decontamination of the monitor in preparation for this calibration, it is likely the sensors had become damaged during normal RCS operation. Decontamination of the monitor may have resulted in additional damage to the sensors. This was the first inspection/calibration of SM-IYR-6021 since it had been placed in service in April 1986. The monitor was calibrated and reinstalled in the same location in January 1987, and was discovered damaged during its next inspection on May 11, 1988.

Since this location has been identified as unacceptable for the monitor, it has not been reinstalled, but an evaluation to determine a suitable location for the monitor is in progress. The new location will probably be the Safety Injection System (SIS) combined flow line to the loop (common line shared by the SIT and Low Pressure Safety Injection discharge). This line meets the regulatory requirements for being on "Reactor Piping" since this is an ASME Class 1 section of piping and is part of the RCS pressure boundary. The advantages of this location are lower ambient temperature conditions, normally stagnant flow, lower process line temperature conditions, and reasonable access. This change is consistent with other plants, which have either located or relocated this monitor to SIS piping. Design changes are being initiated to relocate this monitor during the third refueling outage.

Until this instrument is relocated to another location, the capability remains available to determine the effect of a seismic event on the RCS. SM-IYR-6020 is available to provide a means of comparing the effect of an actual seismic event with the design analysis. Seismic monitors located on the containment basemat and wall provide data to determine input forcing functions to RCS supports to compare with design seismic inputs. Since there is sufficient capability to monitor a seismic event, there was no safety significance to this event.

PLANT CONTACT

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