LICENSEE EVENT REPORT (LER)

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Title (4)

UNIT 3 CORE ALTERATIONS INITIATED WITHOUT AUDIBLE NEUTRON SOURCE RANGE INDICATION IN CONTAINMENT

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
Month	Day	Year	Year	/// Sequential Number ///	Revision Number	Month	Day	Year	Facility Names	Docket Number(s)
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OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
6		___ 20.402(b)	___ 20.405(c)	___ 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10)	0 0 0	___ 20.405(a)(1)(i)	___ 50.36(c)(1)	___ 50.73(a)(2)(v)	___ 73.71(c)		
		___ 20.405(a)(1)(ii)	___ 50.36(c)(2)	___ 50.73(a)(2)(vii)	___ Other (Specify in Abstract below and in text)		
		___ 20.405(a)(1)(iii)	X 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)			
		___ 20.405(a)(1)(iv)	___ 50.73(a)(2)(ii)	___ 50.73(a)(2)(viii)(B)			
		___ 20.405(a)(1)(v)	___ 50.73(a)(2)(iii)	___ 50.73(a)(2)(x)			

LICENSEE CONTACT FOR THIS LER (12)

Name	TELEPHONE NUMBER AREA CODE
R. W. Krieger, Station Manager	7 1 4 3 6 8 - 6 2 5 5

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS

SUPPLEMENTAL REPORT EXPECTED (14)		Expected Submission Date (15)	Month	Day	Year
___ Yes (If yes, complete EXPECTED SUBMISSION DATE)	XX NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

At 0521 on 2/19/92, with Unit 3 in Mode 6 for the Cycle 6 refueling, it was determined that the source range neutron flux monitor was not providing audible indication in containment at the commencement of core reload, as required by Technical Specification (TS) 3.9.2, "Refueling Operations, Instrumentation." Core alterations were promptly secured. Core alterations were subsequently resumed at 0630 on 2/19/92 following restoration of the source range neutron flux monitor audible indication.

The inoperable audible indication was the result of the Audible Count Rate (ACR) booster amplifier having been placed in the "off" position. Prior to the commencement of core reload, Operations personnel erroneously concluded that the audible indication was functioning properly, but that the background count rate without a neutron source was not sufficiently high to produce an audible output that could be heard above the containment background noise. Consequently, the undetected problem with the audible indication did not become evident until the first fuel assembly was placed in the reactor, and a condition prohibited by the TSs had already occurred.

The ACR booster amplifier was re-energized, thus restoring containment audible count rate. Corrective actions include review of this event by appropriate Operations personnel, procedure modifications, and strengthening of administrative controls governing the installation and use of the ACR booster amplifier.

Only one fuel assembly had been loaded into the reactor when core alterations were suspended. There is therefore no safety significance associated with this event, since it is not possible for a criticality condition to occur with a single fuel assembly in the core.

Plant: San Onofre Nuclear Generating Station
Unit: Three
Reactor Vendor: Combustion Engineering
Event Date: 02-19-92
Time: 0521

A. CONDITIONS AT TIME OF THE EVENT:

Mode: 6, Refuel
RCS Temperature: Ambient

B. BACKGROUND INFORMATION:

1. Neutron Flux Monitoring System:

The neutron flux monitoring system [IG] includes neutron detectors [DET] located around the reactor core [AC] and signal conditioning equipment located in the containment building [NH], control area [NA], and in the penetration area. Neutron flux is monitored from source levels through full power operation, and signal outputs are provided for reactor control, reactor protection [JC], and information display. A total of six channels of instrumentation are provided; two source range channels and four safety channels (the safety channels were not involved in this event and will not be discussed).

The source range channels provide source level neutron flux information from 1E-1 to 1E+5 counts per second (cps) to the reactor operator for use during extended shutdown periods, initial reactor startup, and startup after extended periods of reactor shutdown, such as core refueling operations. Each channel consists of a fission chamber - type detector, one preamplifier [AMP], a signal processor, logarithmic amplifier, and test circuitry. These channels provide readout and audio count rate information but have no direct control or protective functions.

2. Operating Instruction SO23-3-3.25.1:

Operating Instruction SO23-3-3.25.1, "Once A Shift Surveillance (Modes 5-6)," requires while in Mode 6, shiftly verification that both startup channels are indicating 2 to 20 counts per second and that audible indication in containment and the control room is provided.

3. San Onofre Nuclear Generating Station (SONGS) Refueling Procedure Information:

SONGS Refueling Procedure, SO23-X-7, "Nuclear Fuel Movement," requires that a response check of the neutron flux detectors be performed prior to loading fuel into a defueled reactor vessel. The response check is accomplished by moving a single fuel assembly (providing a neutron source) into the core and passing it near adjacent neutron detectors to establish a

signal level which is compared to a base "noise" level. The noise level is determined by measuring the neutron counts of the defueled core. A Signal-to-Noise-Ratio (SNR) is then computed based on these measurements.

4. Technical Specification (TS) 3.9.2, "Refueling Operations, Instrumentation":

   TS 3.9.2 requires that a minimum of two source range neutron flux monitors be OPERABLE and operating, each having continuous visual indication in the control room and one having audible indication in the containment and control room while in Mode 6. Action A requires that, with one of the required monitors inoperable or not operating, CORE ALTERATIONS or positive reactivity changes are to be immediately suspended.

   TS 4.9.2 surveillance requirements state that each source range neutron flux monitor shall be demonstrated OPERABLE by the performance of:

   a. A channel check at least once per 12 hours,

   b. A channel function test within 8 hours prior to the initial start of core alterations, and

   c. A channel functional test at least once per 7 days.

   As discussed in the Basis of TS 3.9.2, the OPERABILITY of the source range neutron flux monitors ensures that redundant monitoring capability is available to detect changes in the reactivity condition of the core.

5. Containment Source Range Audible Count Rate (ACR) Booster Amplifier:

   During refueling operations, an ACR booster amplifier is installed to increase the audible containment neutron source range indication volume level above containment background noise.

C. DESCRIPTION OF THE EVENT:

1. Event:

   At 0521 on February 19, 1992, with Unit 3 in Mode 6 for the Cycle 6 refueling, it was determined that the source range neutron flux monitor selected to provide audible indication in the containment building was not operating prior to the commencement of core reload, as required by TS 3.9.2. This condition was discovered during the SNR determination of the neutron flux detectors. Core alterations were secured by placing the first fuel assembly in its designated core location.

   Core alterations were resumed at 0630 on February 19, 1992, after restoring the containment source range neutron flux audible indication to service.

2. Inoperable Structures, Systems or Components that Contributed to the Event:

None.

3. Sequence of Events:

TIME	ACTION
0521	Core alterations commenced as the first fuel assembly is lowered into the reactor vessel for neutron flux detector SNR determination. Core alterations subsequently secured.
0630	Core alterations resumed after restoring the containment neutron flux audible indication to service.

4. Method of Discovery:

As described in section C.1 above.

5. Personnel Actions and Analysis of Actions:

Operators responded properly by promptly securing core alterations upon discovery that the containment source range monitor audible indication was inoperable.

6. Safety System Responses:

Not applicable.

D. CAUSE OF THE EVENT:

1. Immediate Cause:

The ACR booster amplifier for the containment count rate speaker was found to be in the "off" position. Our investigation has not determined the circumstances that resulted in de-energizing the amplifier.

2. Intermediate Cause:

The Shift Superintendent (SS) and the Control Room Supervisor (CRS) (both utility, licensed) erroneously concluded that the audible indication was functioning properly. Although the audible indication could not be heard when checked, it was concluded that, with no neutron source in the reactor, the background count rate was not sufficiently high to produce an audible output that could be heard above the containment background noise. Consequently, the once-per-shift Operations surveillance was modified to delete verification of containment audible indication prior to commencing core reload.

3. Root Cause:

Operations personnel involved in the preparations for core alterations did not recognize that failure to positively validate the audible indication (for example, by waving a neutron source other than a fuel assembly in front of the detectors) prior to commencement of core reload may result in a violation of TSs. By using a fuel assembly to validate the audible indication, an undetected problem with the equipment would not become evident until a condition prohibited by the TS had already occurred.

4. Contributing Cause:

Administrative controls governing the installation and use of the ACR booster amplifier were deficient in that use of the amplifier was not reflected in affected operating procedures. As a result, some Operations personnel were not familiar with the use and operation of the ACR booster amplifier.

E. CORRECTIVE ACTIONS:

1. Corrective Actions Taken:

The ACR booster amplifier was re-energized, thus restoring containment audible count rate.

2. Planned Corrective Actions:

a. This event will be reviewed by appropriate Operations personnel, with emphasis on ensuring that the TSs are thoroughly considered when performing procedure modifications.

b. The shiftly source range monitor verification surveillance procedure will be modified to include acceptance criteria suitable for determining source range monitor operability prior to the commencement of core reload when the reactor is defueled.

c. The source range monitor channel check functional test procedure was performed properly and in accordance with TSs. Notwithstanding this, since the functional test does not include verification of speaker operation, the procedure will be modified to include a step to verify speaker operation.

d. Administrative controls governing the installation and use of the ACR booster amplifier will be strengthened.

F. SAFETY SIGNIFICANCE OF THE EVENT:

At the time core alterations were secured, only one fuel assembly had been loaded in the core. There is therefore no safety significance associated with this event since it is not possible for a criticality condition to exist with a single fuel assembly in the core.

G. ADDITIONAL INFORMATION:

1. Component Failure Information:

Not Applicable.

2. Previous LERs for Similar Events:

Not Applicable.