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SUBJECT: LER 89-006-01:on 891127,polar crane Tech Spec violated due to mgt deficiency,inadequate policy.

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DUKE POWER

March 7, 1990

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, DC 20555

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 287/89-06 Supplement, Revision 1

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 287/89-06, Revision 1, concerning the polar crane Technical Specification violated due to management deficiency, inadequate policy. This supplement is being issued to give further information on root cause and safety analysis.

This report is being submitted in accordance with 10 CFR 50.73 (a)(2)(i)(B). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

H. B. Barron
Station Manager

RSM/ftr

Attachment

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(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Oconee Nuclear Station, Unit 3	0 5 0 0 0 2 8 7	1 OF 0 8

TITLE (4)
Polar Crane Technical Specification Violated Due to Management Deficiency, Inadequate Policy

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)
1 1	2 7	8 9	8 9	— 0 0 6 —	0 1	0 3	0 7	9 0		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9): N

POWER LEVEL (10): — 0 —

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: *(Check one or more of the following)* (11)

20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
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, NRC Form 366A)*
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)
Henry Lowery, Chairman Oconee Safety Review Group	8 0 3 8 8 5 - 3 0 3 4

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)

☐ YES *(If yes, complete EXPECTED SUBMISSION DATE)* ☒ NO

EXPECTED SUBMISSION DATE (15): MONTH | DAY | YEAR

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

On November 27, 1989, at approximately 1530 hours, with Unit 3 in a refueling outage, the reactor building polar crane was operated with the main hook over the fuel transfer canal during tendon surveillance while fuel movement was in progress. This was a violation of Technical Specification 3.12.1. Upon subsequent removal of the polar crane from the fuel transfer canal area, the NRC inspector also noticed that the crane flagman was stationed on the 3rd. floor instead of on top of the secondary shield wall. This was a violation of Technical Specification 3.12.4. This condition was identified by a resident NRC inspector during a tour of the reactor building. Immediate corrective actions were to suspend fuel movement, terminate the tendon surveillance, and remove the polar crane from the fuel transfer canal area. The root cause of this incident is Management Deficiency, inadequate policy. After the polar crane was removed from the fuel transfer canal area, fuel movement was resumed.

☆ U.S.GPO:1984-0-454-481/18759

BACKGROUND

The reactor building [EIIS:NH] polar crane is used for removing and reinstalling shield blocks, the reactor vessel head, upper vessel internals [EIIS:AC], the reactor coolant pumps, and on occasion, other miscellaneous equipment and loads. Use of the polar crane during outages is controlled/scheduled by the Reactor Building Coordinator who is part of the outage planning group.

The fuel transfer canal forms a passageway in the reactor building extending from the reactor vessel to the reactor building wall (see figure-page 7). It is formed by an upward extension of the primary shield walls. The enclosure is a reinforced concrete structure lined with stainless clad plate to form a canal above the vessel which is filled with borated water for refueling evolutions. Fuel movement is defined as any time a fuel assembly is attached to a fuel handling bridge, the auxiliary hoist, or is in the fuel transfer carriage mechanism which transports spent fuel assemblies to and from the reactor building and spent fuel pool.

Technical Specification 3.12.1 states, "The reactor building polar crane shall not be operated over the fuel transfer canal when any fuel assembly is being moved."

Technical Specification 3.12.4 states, "When the reactor vessel head is removed and the polar crane is being operated in areas away from the fuel transfer canal, the flagman shall be located on top of the secondary shield wall when the polar crane hook is above the elevation of the fuel transfer canal."

EVENT DESCRIPTION

On November 8, 1989, Unit 3 shutdown to start a refueling outage. As part of this outage, work request (WR) 57997C was planned to perform secondary shield wall tendon surveillance. In order to perform surveillance on tendons, the polar crane was needed to lift and position the jacking ram which tests the tension of the tendons. This work was coordinated around the availability of the polar crane which was controlled by the Reactor Building Coordinator. In previous outages, this work had been completed during early morning hours when fuel movement was not in progress and while the fuel transfer canal was full of water. The reason for having the canal full of water is for shielding purposes.

On November 15, WR 57997C was started. On November 22, surveillance was being performed on tendons located at the South end of the fuel transfer canal. This work was terminated later that day because of high dose rates in the area due to the fuel transfer canal being drained to facilitate valve maintenance. This situation was looked into by outage management and it was decided on November 24 to resume the tendon work on the morning of November 27 when the transfer canal would be refilling in preparation for fuel movement. This depth would provide enough shielding for the tendon surveillance to continue. It was also discussed that resuming tendon surveillance on this date might interfere with refueling which was previously scheduled to begin on the same date. However, this schedule was approved because, as outage management understood the scope of the job, the polar crane would not be operated over the fuel transfer canal, only to the side of it. They also assumed that the procedure, MP/O/A/1710/22, "Crane-Polar or CRD-Operation Over Fuel Transfer Canal with Open Reactor Vessel", would cover operation of the polar crane in situations, such as this, where the load on the crane would only be close to the canal and not directly over the water surface.

On November 27, at approximately 0730, Reactor Building Coordinator A (RBC-A) contacted Operations Coordinator A (OC-A) for permission to use the reactor building polar crane to reinstall an exhaust fan which had been removed to facilitate previous tendon surveillance. These fans were located at the Southeast edge of the fuel transfer canal. Because fuel movement was scheduled to begin by mid morning, OC-A granted RBC-A permission to use the polar crane but told RBC-A to ensure that polar crane operation around the fuel transfer canal was controlled by the use of an appropriate maintenance procedure.

At approximately 1000 hours, CMD Technician A (CMD-A), a member of the tendon surveillance crew, contacted the Senior Reactor Operator (SRO-A) in charge of fuel handling for permission to start tendon surveillance. SRO-A granted CMD-A permission to begin work on the tendons. CMD-A then asked SRO-A for permission to operate the polar crane over the fuel transfer canal since it was called for in the procedure (MP/O/A/1710/22). SRO-A told CMD-A that he could not give permission to operate the polar crane over the fuel transfer canal because fuel movement was ready to begin. CMD-A stated that he had a procedure that would cover operation of the polar crane over the transfer canal. However, because the jacking ram used to do tendon surveillance was positioned over the canal walkway and not over the canal water surface, the step in the procedure to stop fuel movement while moving the crane over the transfer canal was signed as not applicable. Tendon surveillance was subsequently started and the polar crane was used to lift the jacking ram into place along the Southeast end of the fuel transfer canal.

At approximately 1330, Reactor Operator A (RO-A), the main fuel bridge operator, questioned the position of the polar crane near the fuel transfer canal and asked SRO-A if he was aware of work ongoing in the Southeast corner of the fuel transfer canal area which involved use of the polar crane. SRO-A stated that he was aware of the tendon surveillance and fuel movement continued. At 1530, fuel movement was stopped to repair an audible neutron flux monitor [EIIS:IG]. During this hold, a resident NRC inspector, who was touring the reactor building at the time, questioned RO-A about the main hook of the polar crane being over the fuel transfer canal. RO-A directed the NRC inspector to confer with SRO-A since he had previously said that clearance had been given to work there. After discussions between the NRC inspector and SRO-A, the main hook of the polar crane was determined to be over the Southeast corner of the fuel transfer canal which was in violation of Technical Specification 3.12.1. Immediate corrective actions were to not allow fuel movement to resume until the polar crane was removed from the fuel transfer canal area and work in the fuel transfer canal was terminated. During removal of the polar crane from the fuel transfer canal area, the NRC also noticed that the flagman was stationed on the 3rd. floor instead of on top of the secondary shield wall as specified in Technical Specification 3.12.4. This constituted a violation of Technical Specification 3.12.4. Fuel movement was resumed at 1707 hours.

CONCLUSIONS

The root cause of this incident is Management Deficiency, due to inadequate policy concerning operation of the polar crane over the fuel transfer canal as specified by Technical Specification 3.12. The basis for this cause is discussed below and contains many contributing factors. It is concluded from investigation that all personnel involved with the decision to allow tendon surveillance at the South end of the fuel transfer canal to commence concurrently with fuel movement did not fully understand what "operation of the polar crane over the fuel transfer canal" meant. Most people interviewed were under the mistaken impression that it pertained to lifting/suspending a load from the polar crane hook and moving this load across the surface of the water while fuel movement was taking place. It was also assumed that the load, in this instance, only pertained to what was rigged to one of the crane's hooks and did not include the crane's other hook if it was not involved in the lift. In addition, there was a misunderstanding of what "over the fuel transfer canal" meant. According to the basis of Technical Specification (TS) 3.12, "The fuel transfer canal will be delineated by readily visible markers at an elevation above which the reactor building polar crane would not normally handle loads." Not only are there no markers in Unit 3's

reactor building to designate the boundaries of the "fuel transfer canal", the personnel involved in this incident had mistakenly believed the boundary to be the surface of the water contained within the canal. Therefore, when it was decided to use procedure MP/O/A/1710/22, "Crane-Polar or CRD- Operation Over Fuel Transfer Canal with Open Reactor Vessel", steps to stop fuel movement were marked not applicable due to the belief that because the load was not over the water, it was not necessary to stop fuel movement. It was originally thought that the use of this procedure would ensure compliance with TS 3.12 although this procedure is written to make a one-time-only move of a load across the fuel transfer canal and only after fuel movement is stopped. These misunderstandings by personnel of the TS were in error and led to the inappropriate use of a procedure which resulted in a TS violation.

It is also concluded that the crane operator training, given by the Production Training Support group, is deficient in that it makes no reference to, nor includes any of the requirements of, Technical Specification 3.12. It was found during interviews that although some of the crane operators and flagmen knew that the main hook of the polar crane was considered part of the load, they did not know that there was a TS related to operation of the polar crane over the fuel transfer canal.

Therefore it can be seen that managements misinterpretation of TS 3.12 led to the scheduling of tendon surveillance, which required the use of the polar crane, during a period of time which conflicted with fuel movement and to the use of a procedure which did not cover the scope of the work. A contributing cause of the violation of TS 3.12.4, stationing of the flagman on the 3rd. floor instead of on top of the secondary shield wall, is Inappropriate Action, failure to follow procedure. In this incident, a procedure was used but the step requiring the correct position of the flagman was not followed. These misunderstandings combined with the lack of training on the requirements of TS 3.12 led to the subsequent violation.

A review of events occurring within the last 12 months revealed no other similar events with the same root cause. Therefore, this event is classified as nonrecurring. There were no radiation exposures, radioactive releases, or injuries associated with this event. The health and safety of the public were not compromised. This incident did not involve any component failure; therefore, it is not NPRDS reportable.

CORRECTIVE ACTIONS

Immediate

1. Fuel movement was suspended until the polar crane was removed from the fuel transfer canal area.

2. Tendon surveillance work taking place at the Southeast end of the fuel transfer canal was terminated until fuel movement was completed.

Subsequent

1. Maintenance Engineering wrote a training package on the use of the polar crane over the fuel transfer canal which clarified the requirements of Technical Specification 3.12.

2. Polar crane operators and flagmen received training on Maintenance Engineering's clarification of Technical Specification 3.12.

3. Maintenance added a caution statement to standing work requests on secondary shield wall tendon surveillance to observe requirements of Technical Specification 3.12 while performing work.

Planned

1. Production Training Support group will incorporate Technical Specification 3.12 into their crane operator training.

2. Maintenance will revise MP/O/A/1710/22, "Crane-Polar or CRD-Operation Over Fuel Transfer Canal with Open Reactor Vessel," to reflect requirements of Technical Specification 3.12.

3. Maintenance will delineate canal boundaries as defined in Technical Specification 3.12.

4. Compliance will pursue writing an interpretation of Technical Specification 3.12 which will define what is meant by "operation of the polar crane" and establish the boundaries of the "fuel transfer canal."

SAFETY ANALYSIS

The basis for Technical Specification 3.12 is to restrict the use of the polar crane over the fuel transfer canal while the reactor vessel head is removed in order to preclude dropping of materials or equipment into the reactor vessel and possibly damaging the fuel assemblies to the extent that it would cause a release of fission product gases which were contained in the gap between the fuel pellets and cladding.
If it is assumed in this incident that the main hook of the polar crane, which was over the fuel transfer canal during fuel movement, had dropped

into the canal, it is likely, due to its position at the Southeast corner of the canal, that it would not have damaged any fuel assemblies. This would be due to the fact that fuel movement was taking place at the north end of the canal. At the time the polar crane main hook was determined to be over the Southeast corner of the fuel transfer canal, there were only 9 fuel assemblies in the reactor vessel and 5 of these were new. Due to the configuration of the 4 previously irradiated fuel assemblies and the size of the main hook, it is safe to assume that if the main hook had fallen into the reactor vessel, it would have not damaged more than 2 irradiated fuel assemblies. If the worst case is assumed, that 2 irradiated fuel assemblies are damaged to the extent of releasing fission products, any releases would be well below 10CFR100 limits and would be monitored and controlled. Furthermore, during this incident, containment integrity was maintained as required by the Refueling Procedure and Technical Specification 3.8.

Therefore, since nothing was dropped into the fuel transfer canal and no fuel assemblies were damaged, the health and safety of the public were not impacted by this event.

FUEL TRANSFER CANAL