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AUTH.NAME AUTHOR AFFILIATION
LOWERY,H.R. Duke Power Co.
BARRON,H.B. Duke Power Co.
RECIP.NAME RECIPIENT AFFILIATION

SUBJECT: LER 91-004-00:on 910208,work crew installed 3/4 inch conduit through firewall separating east & west penetration rooms. Crew mistakenly assumed wall not firewall.Caused by failure of crew to follow procedures.Individuals counseled.

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Duke Power Company
Oconee Nuclear Station
P.O. Box 1439
Seneca, SC 29679

(803)885-3000

DUKE POWER

April 19, 1991

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

Subject: Oconee Nuclear Station
Docket Nos. 50-269, -270, -287
LER 287/91-04

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a)(1) and (d), attached is Licensee Event Report (LER) 287/91-04 concerning a degraded fire barrier.

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

xc: Mr. S. D. Ebneter
Regional Administrator, Region II
U.S. Nuclear Regulatory Commission
101 Marietta St., NW, Suite 2900
Atlanta, Georgia 30323

Mr. L. A. Wiens
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

NRC Resident Inspector
Oconee Nuclear Station

INPO Records Center
Suite 1500
1100 Circle 75 Parkway
Atlanta, Georgia 30339

M&M Nuclear Consultants
1221 Avenue of the Americas
New York, NY 10020

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED OMB NO. 3150-0104
EXPIRES: 4/30/92

ESTIMATED BURDEN PER RESPONSE TO COMPLY WTH THIS INFORMATION COLLECTION REQUEST: 50.0 HRS. FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO THE RECORDS AND REPORTS MANAGEMENT BRANCH (P-530), U.S. NUCLEAR REGULATORY COMMISSION, WASHINGTON, DC 20555, AND TO THE PAPERWORK REDUCTION PROJECT (3150-0104), OFFICE OF MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

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) Inappropriate Action, Failure to Follow Procedure, During a Nuclear Station Modification Implementation Results in a Degraded Fire Barrier

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)
0 2	0 8	9 1	9 1	0 0 4	0 0	0 4	1 9	9 1		0 5 0 0 0
										0 5 0 0 0

OPERATING MODE (9)	POWER LEVEL (10)	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
N	0	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) (b)	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
Henry R. Lowery, Chairman	AREA CODE 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	MANUFAC-TURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFAC-TURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

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

On February 8, 1991, during the implementation of a Nuclear Station Modification (NSM), a work crew installed 3/4 inch conduit through the firewall separating the East and West Penetration rooms for Unit 3. The breach was not sealed nor was a fire watch established as required by Technical Specifications. The crew had mistakenly assumed the wall was not a firewall and failed to follow the implementation procedure for the NSM. On March 20, 1991, at 0800 hours, a Technical Support Leader was reviewing the paperwork on the NSM due to questions by one of the crew members concerning the unsealed penetration. His review identified the wall as a fire barrier. It was determined that the breach had indeed been made to a firewall without the required compensatory actions. They then initiated action to get the breach sealed. The repairs were completed that afternoon and the fire barrier was declared operable at 1950 hours. Unit 3 was at 100% full power when the incident occurred and remained there until it was shutdown for a scheduled refueling outage on February 13, 1991. The unit reached cold shutdown on February 15, 1991, at 1235 hours. The root cause of this incident was assigned Inappropriate Action, failure of the work crew to follow procedure. A contributing cause was Management Deficiency, inadequate planning. Corrective actions included repairing the breached fire barrier, counseling of the individuals involved, and procedure revision.

BACKGROUND

A firewall (EIIS:KP) is a structure which is designed to impede the travel of smoke or flame. Firewalls are used to impede the spread of a fire to areas containing safety related equipment.

At Oconee, two Penetration Rooms are located in the Auxiliary Building (EIIS:NF) adjacent to the Reactor Building (EIIS:NH). The Penetration Rooms are the location of most fluid and electrical penetrations to and from the Reactor Building. Safety related equipment such as Engineered Safeguards System (EIIS:JE) and Emergency Feedwater System (EIIS:BA) valves are located in the Penetration Rooms. The Penetration Rooms are identified as East Penetration Room and West Penetration Room and are separated by a firewall with a fire door.

Oconee Technical Specification 3.17, "Fire Protection and Detection Systems", requires all fire barrier penetrations protecting safety related areas to be operable. If such a barrier is not operable, Technical Specifications further require that a determination of fire detection instrumentation for the affected area be made. If the instrumentation is operable, a fire watch, which consists of a physical inspection of an area or equipment to determine if a fire or threat of fire exists, shall be performed every hour. If fire detection instrumentation is not operable, then a continuous fire watch is required.

Nuclear Station Modification (NSM) 32845, Part AL1, "CAD Doors for Vitalizing West Penetration Room and Cask Decontamination Room," involved the upgrading of security requirements in the Unit 3 West Penetration Room. One of the upgrades was the installation of a computerized security badge card reader (CAD) on the wall between the West and East Penetration Rooms. It required running a 3/4 inch conduit through the wall separating the two rooms.

Work requests are used to document the work performed on most station equipment. The work request form includes a section which specifies the Quality Assurance (QA) condition of the equipment. QA condition is the level of the Quality Assurance Program that has been applied to certain areas of design, construction, operation and maintenance. The QA condition for fire protection equipment is QA 3.

EVENT DESCRIPTION

Nuclear Station Modification (NSM) 32845, Part AL1, was scheduled to be implemented on Unit 3 beginning February 8, 1991. Unit 3 was at 100 percent full power and it was desired to complete the NSM prior to the Unit's upcoming refueling outage scheduled to begin on February 13, 1991.

The NSM was scheduled and planned using Work Request (WR) 98672 which stated: "Install the CAD doors for NSM 32845 per the instructions in TN/3/B/2845/0/AL1. NRC Commitment." In Section II of the WR, which

specifies additional requirements, instructions, and procedures to use, the Quality Assurance (QA) condition was denoted to be not applicable (N/A). This section had been previously prepared by the Technical Support Leader and the Accountable Engineer for the NSM.

On February 8, 1991, the NSM implementation was assigned to one of the Construction and Maintenance Department (CMD) crews that normally perform NSM work. The CMD Crew Supervisor was attending scheduled training and a crew member was assigned duties as the Temporary Supervisor. Temporary Supervisor (TS) A reviewed his work list for the day and assigned various jobs to the seventeen crew members. The NSM for the West Penetration wall was assigned to two temporary employees and, along with TS A, they reviewed the scope of the job. They reviewed the NSM implementation package which included the work request, the implementing procedure and drawings. They then visited the job site at the West Penetration Room to investigate the job.

From this review, TS A made the assumption that the wall was not a fire barrier but some type of moisture barrier. He then instructed the workers to install the hardware, drill the hole for the conduit, and install the conduit. He decided that the penetration did not have to be sealed after the conduit was installed and that a fire watch was not required. TS A stated that he based this decision on the following; he had nothing in his work package to indicate that the wall was a fire barrier, the work request indicated that there was no QA condition, and he observed no local signs to denote the wall as a fire barrier. He also stated that, in his experience, most of the fire barrier walls were 10 inches thick whereas this wall was only 6 inches thick.

The NSM implementing procedure, TN/3/B/2845/00/AL1, "Implementing Procedure for Vitalization of the West Penetration Room and Cask Decontamination Room," had instructions to install the CAD hardware on the wall that separates the East and West Penetration Rooms. After the steps that called for the installation of the hardware, step 8.7.2 stated, "Install conduit per DRG. 0-909D and IP/0/A/3010/003A". Drawing 0-909D, which was a detailed drawing of the installation of the hardware and conduit in relation to the wall, had no indication that the wall was a fire barrier. IP/0/A/3010/003A, "Procedure for Mounting Field Run Instrument Tubing and Cable Support System" was the procedure that the Accountable Engineer had included in the implementing procedure to control any penetration of fire barriers. The reference to fire barrier control is in the procedure section under a list of notes located before the action statements. Note 10 states, "New penetrations shall be assigned an appropriate firestop number by the responsible Maintenance Engineer." Note 11 states, "Breached firestops shall be opened and repaired in accordance with the appropriate firestop procedure." TS A stated that he did not read this section of the procedure and had decided that he did not have to use it as directed by the implementing procedure because, in his mind, he was not penetrating a fire barrier.

TS A left the work area in the West Penetration Room to check on other jobs involving his crew. He made several progress checks with the workers in the Penetration Room during the day. Later in the afternoon

of February 8, 1991, the workers completed NSM 32845, Part AL1 and signed the procedure step denoting the job was complete. They had drilled a 1 inch hole in the wall and installed a 3/4 inch conduit.

On February 13, 1991, at 1500, Unit 3 was removed from service to begin a scheduled refueling outage. The unit reached cold shutdown at 1235 hours on February 15, 1991.

On March 19, 1991, the CMD crew member that had drilled the hole and installed the conduit told the CMD Crew Supervisor that he had noticed a large gap between the conduit and wall and questioned if it should be sealed. The CMD Crew Supervisor contacted the crew that seals firestops and asked them to seal this penetration. Later that afternoon the sealing crew contacted the CMD Crew Supervisor and informed him that the conduit had penetrated a fire barrier and they would need a firestop number from the responsible Maintenance Engineer before they could seal it. The CMD Crew Supervisor then contacted CMD Scheduler A, who had scheduled the NSM work, for help on resolving the problem. CMD Scheduler A attempted to contact the Technical Support Leader for the NSM but was unable to reach him. Since it was late in the afternoon, CMD Scheduler A decided he would pursue the problem the next day.

On March 20, 1991, at 0730 hours CMD Scheduler A contacted the Technical Support Leader (TSL) and informed him of the potential problem. The TSL said he would review the problem. At 0800 hours, while reviewing the paperwork on the NSM, he noticed a drawing that identified the wall as a fire barrier. He contacted the CMD Crew Supervisor and informed him of his suspicions but that he needed to talk with TS A and the crew that had installed the conduit. TS A was not working on site and was unable to be contacted. The TSL then contacted the Accountable Engineer and informed him of his findings and concerns and questioned him for further guidance. The Accountable Engineer made several attempts to telephone Unit 3 Operations Manager and the Safety Group Manager but was unable to contact them. At 1300 hours the Accountable Engineer contacted the Maintenance Engineer that assigned firestop numbers and questioned him as to what should be done. The Maintenance Engineer said he would investigate and call him back. The Accountable Engineer was contacted by the Maintenance Engineer with an assigned penetration number to firestop the penetration. At 1500 hours the Accountable Engineer contacted the TSL with the information and instructed him to proceed with the repairs to the fire wall. At 1715 a fire watch was established at the breach and the repairs began. The firewall was declared operable at 1950 hours on March 20, 1991.

CONCLUSIONS

The root cause of this event is Inappropriate Action, followed no procedure when one existed, on the part of Temporary Supervisor (TS) A. TS A was controlling the procedures used to install the conduit through the Penetration Room wall. The Nuclear Station Modification (NSM) implementing procedure TN/3/2845/00/AL1 had a step stating "Install

conduit per DRG. 0-909D and IP/0/A/3010/003A". TS A made the assumption that the wall was not a fire barrier and chose not to use the IP/0/A/3010/003A (IP) procedure to install the conduit. A note in the IP, if read and used, would have directed the procedure user to have the penetration assigned a firestop number. This would have alerted personnel that the wall was a fire barrier. It certainly can be supported that the IP could have been enhanced to adequately control the work which breached the fire barrier. The procedure relied only on a note at the front of the procedure and it also had a less than adequate statement of the Purpose and General Description. On the other hand, it is not permissible for a the procedure user to disregard a direct step in a procedure. At the minimum, if the procedure is wrong, a procedure change would be the proper way to fix the problem.

A contributing cause to this event is Management Deficiency, inadequate planning in the development of the NSM package. There were several opportunities in the planning and development of the NSM package to clearly denote that the wall in the Penetration Room was a fire barrier. The controlling procedure for the NSM implementation should have stated explicitly that the Penetration Room wall was a fire barrier. The Oconee Nuclear Station Projects Services Manual, in its Technical Review Guidelines, states that the procedure should "include adequate steps to control and repair work which violates a fire barrier....". The NSM implementing procedure referred only to a procedure to field route the conduit and it did not specifically state, as an action step, the precautions that would be necessary to prevent a breach of a fire barrier. Furthermore, neither the drawings specified to route the conduit nor the Work Request used to plan the work, were designated as Quality Assurance condition 3. This would have indicated that the installation involved fire protection. Also, the Maintenance Procedure for sealing firestops was not specified on the Work Request or in the implementing procedure as required by Station Directives.

The firewall between the Unit 3 East and West Penetration Rooms was breached with a one inch hole from February 8, 1991, to March 20, 1991. A 3/4 inch conduit was placed in this penetration without sealing. Since the Unit was shutdown for a refueling outage on February 13, 1991, at 1500 hours and reached cold shutdown at 1235 hours on February 15, 1991, and remained at cold shutdown until March 21, 1991, Technical Specification for Fire Protection was violated for approximately 7 days. Station Administrative controls for compensatory actions in cases where fire barriers are breached do not distinguish between Technical Specification required operability and other operational status. Thus, Station Administrative controls were violated from the time the fire barrier was breached until the time a fire watch was established when the repairs were started. Also, once the problem was identified, there was less than adequate response in taking immediate corrective actions to resolve the problem. This indicates a less than adequate understanding of Station Administrative controls for fire barriers. It is concluded that the response would not have been different had the Unit been above cold shutdown, when Technical Specification requires compensatory action. The planned corrective action addressing this awareness problem should preclude a similar situation.

A review of events occurring over the last two years indicate that this is a recurring problem. PIR 4-090-0027 describes an event which occurred on February 21, 1990, involving the unattended breach of a fire door on the High Pressure Service Water [EIIS:KP] pump enclosure. The root cause of that event was inappropriate action on the part of a work crew. A work practice deficiency in Planning and Scheduling Management was also identified. A corrective action was to assess the need to include fire barrier concerns in the planning process and was addressed to the Station Maintenance Planning and Scheduling Section. The Station Planning and Scheduling Section is a separate group from the Construction and Maintenance Division (CMD) planning group. A training package was issued to the Station planners, who were encouraged to be aware of fire barrier situations in the planning process. The similar nature of the two events indicate that the previous corrective action was not effective. The training package was not distributed to all personnel who plan Work Requests. Those groups omitted from the previous report will be included in the corrective actions of this report.

This event is not NPRDS reportable. There was no release of radioactive material or exposure to radiation involved. This event did not involve any personnel injuries.

CORRECTIVE ACTIONS

Immediate

None

Subsequent

1. The Safety Section was notified of a fire barrier degradation.
2. A firewatch was established every hour from the time that the wall was identified as a fire barrier until the breach was sealed.
3. The penetration was repaired with fire retardant sealant.

Planned

1. The Temporary Supervisor and involved workers will be counseled to follow appropriate procedures when installing Nuclear Station Modifications.
2. IP/0/A/3010/003A will be revised to include the identification of fire barriers in action steps.
3. A training package will be issued to all Projects Services Accountable Engineers and Construction and Maintenance Division (CMD) Technical Support Leaders emphasizing the importance of a complete review of the Fire Protection System

requirements when preparing implementing procedures and Work Requests for Nuclear Station Modifications.

4. A training package will be issued to Integrated Scheduling Shift Managers and Operations Unit Supervisors emphasizing the responsibility to include fire barrier information if called upon to plan work requests during emergencies or urgent situations.

5. A training package will be issued to station CMD personnel involved in NSM work which emphasizes the importance of administrative controls of fire protection systems. The deficiencies of this report will also be discussed.

SAFETY ANALYSIS

The East and West Penetration Rooms house portions of redundant systems that are necessary to bring the unit to a safe shutdown. The purpose of the wall between the East and West Penetration rooms is to prevent a fire from spreading from one room to the other, destroying the redundant systems that are housed in each room. During this event a small opening (approximately 1/3 square inch) was created when a steel electrical conduit was installed through the wall for the period of time between February 8 and March 20, 1991. During this time the unit operated at 100% full power for approximately seven days and was shutdown for approximately 34 days. While the unit was operating, the fire retardant properties of the wall were required for the protection of the systems housed in the rooms, to ensure the ability to safely shutdown the unit in the event of a fire. There was no need for the fire retardant properties of the wall while the unit was shutdown eliminating the need for shutdown capability.

If a fire occurred, the probability of it propagating through the opening in the wall is negligible because:

The size of the opening is very small in comparison to the area of the entire wall.

The location of the opening is adjacent to and just above a door where there is little or no combustible material within close proximity of either side of the opening.

The conduit travels along the surface of the wall then turns 90 degrees, penetrates the wall, and turns 90 degrees once more prior to entering a junction box. Additionally, there are conduit fittings on each side of the opening. This partially blocks the opening.

Each penetration room contains fire detection devices which would provide early warning of any fire, thereby allowing for the initiation of fire fighting activities. Review of the Reactor Operator log showed no degradation of fire detection devices during the period of inoperability.

Operations and Security personnel each access the Penetration Rooms a minimum of twice per day during their daily rounds, providing an opportunity for early fire detection and mitigation.

Therefore, since the probability of the propagation of a fire through the opening is remote, the likelihood of the early detection of a fire is high, and the fact that no fire occurred during the period of inoperability, the health and safety of the public were not compromised as a result of this event.