TENNESSEE VALLEY AUTHORITY
CHATTANOOGA, TENNESSEE 37401
6N 38A Lookout Place
October 13, 1989

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

Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 2 - DOCKET NO. 50-328 - FACILITY OPERATING LICENSE DPR-79 - LICENSEE EVENT REPORT (LER) 50-328/89013

The enclosed LER provides details concerning the discovery that three incorrect-type smoke detectors were installed in the annulus area of Unit 2, Fire Zone 374. With 19 correct-type photoelectric smoke detectors operable, SQN was in a condition prohibited by Technical Specification 3.3.3.8, which requires 20 photoelectric detectors be operable in Fire Zone 374. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.i.B.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

J. R. Bynum, Vice President
Nuclear Power Production

Enclosure
cc (Enclosure):
Regional Administration
U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Region II
101 Marietta Street, Suite 2900
Atlanta, Georgia 30323

INPO Records Center
Institute of Nuclear Power Operations
1100 Circle 75 Parkway, Suite 1500
Atlanta, Georgia 30339

NRC Resident Inspector
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

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NRC FORM 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT (LER)

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.

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Sequoyah Nuclear Plant, Unit 2	0 5 0 0 0 3 2 8	1 OF 0 3

TITLE (4)
Incorrect Smoke Detectors Located in Unit 2 Annulus Fire Zone 374 Due to Personnel Error

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 9	1 4	8 9	8 9	— 0 1 3 —	0 0	1 0	1 3	8 9		0 5 0 0 0
										0 5 0 0 0

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

OPERATING MODE (9)	1						
POWER LEVEL (10)	1 0 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)	XX 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)
T. A. Matthews, Compliance Licensing Engineer	6 1 5 8 4 3 - 7 5 4 0

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)

On September 14, 1989, with Units 1 and 2 in Mode 1 at 100 percent power, 2,235 pounds per square inch gauge, 578 degrees Fahrenheit, it was discovered that the minimum number of operable photoelectric fire detectors was not maintained for Fire Zone 374 in the annulus area of Unit 2, as required by Technical Specification (TS) Limiting Condition for Operation (LCO) 3.3.3.8 and shown on Table 3.3-11. During the performance of Surveillance Instruction (SI) 234.7, "Technical Specification Fire Detectors," three fire detectors were identified as ionization-type detectors. The remaining 19 detectors were identified as photoelectric-type fire detectors. TS Table 3.3-11 requires a minimum number of 20 photoelectric fire detectors be operable in Fire Zone 374. With only 19 photoelectric fire detectors installed and operable, SQN had operated in a condition prohibited by TSs. The three ionization-type detectors were declared inoperable, and LCO 3.3.3.8 was entered at 0223 Eastern daylight time (EDT) on September 15, 1989. An hourly fire watch was established, a condition adverse to quality report was initiated, and a work request to replace the three incorrect instruments was written and implemented. LCO 3.3.3.8 was exited at 2141 EDT on September 15, 1989, after the detectors were replaced and SI-234.7 was successfully performed. The root cause of this event has been determined to be personnel error and the identification and ordering of incorrect replacement fire detectors.

FACILITY NAME (1)	DOCKET NUMBER (2)	LER NUMBER (6) YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	PAGE (3)
Sequoyah Nuclear Plant, Unit 2	0 5 0 0 0 3 2 8	8 9	— 0 1 3	— 0 0	0 2 OF 0 3

TEXT (If more space is required, use additional NRC Form 366A's) (17)

Description of Event

On September 15, 1989, at 0223 Eastern daylight time (EDT) with Units 1 and 2 in Mode 1, 100 percent power, 2,235 pounds per square inch gauge, and 578 degrees Fahrenheit, Limiting Condition for Operation (LCO) 3.3.3.8 was entered because three ionization-type fire detection devices (EIIS Code IC) in the Unit 2 annulus Fire Zone 374 were declared inoperable, leaving 19 photoelectric-type devices operating. Technical Specification (TS) 3.3.3.8, Table 3.3-11, requires a minimum of 20 photoelectric detectors operable in Fire Zone 374.

This condition was discovered on September 14, 1989, by second shift personnel while performing a regularly scheduled semiannual Surveillance Instruction (SI) 234.7, "Technical Specification Fire Detectors," which verifies that the fire protection system smoke detectors in both reactor buildings actuate as designed. Maintenance personnel tested the 22 fire detectors in the Unit 2 annulus Fire Zone 374 in accordance with the SI. Every detector actuated as designed. However, during the testing process, an electrician observed that all the detectors were not identical. Following a discussion and a physical comparison of different type detectors, it was decided that three of the fire detectors were ionization-type and not the photoelectric-type. This situation was considered unusual, and discussions with the maintenance planners and the shift operations supervisor (SOS) revealed that TS 3.3.3.8 required a minimum of 20 photoelectric-type detectors to be operable. This discovery prompted the SOS to declare the three ionization detectors inoperable, and LCO 3.3.3.8 was entered at 0223 EDT on September 15, 1989. A work request (WR) was written to change out the incorrect detectors, and a condition adverse to quality report (CAQR) was initiated to document and track this problem.

Cause of the Event

The root cause of this event was determined to be incorrect identification and requisitioning of replacement smoke detectors by craftsmen performing replacement activities in 1985.

The investigation that was conducted to identify the cause of the event determined that two of the ionization smoke detectors were installed in October 1985. WRs A529887 and A546142 changed out equipment Identifiers XS-13-203V and XS-13-203R on October 10 and October 28, 1989, respectively. No maintenance replacement documentation could be located for installation of XS-13-203AG, but it is reasonable to conclude that it was installed prior to or during the same timeframe.

A contributing cause of the event could be that Pyrotronics, the manufacturer of the smoke detection devices used in Fire Zone 374, manufactures both ionization and photoelectric smoke detectors. The replacement maintenance requests completed by the craftsmen in October 1985 used a material procurement number that specifies a Pyrotronics ionization smoke detector instead of a material procurement number specifying a Pyrotronics photoelectric detector.

Cause of Event (Continued)

SI-234.7 has been performed semiannually since the installation of the ionization smoke detectors in question. Failure to identify the three ionization detectors from 1985 to 1989 is mitigated by several factors. First, the physical appearance of the ionization and photoelectric-type detectors is very similar. The only visible difference is that the outer cover of the ionization detector is sloped at approximately 60 degrees and the photoelectric outer cover is sloped at approximately 90 degrees. Additionally, there are no visible markings on the exposed exterior portion of the smoke detectors to indicate the type of detector. A manufacturer's code indicating the detector type does exist on the back of the detector; however, the meaning of the code is not obvious, and the detector must be physically removed from its mounting bracket to see the code. SI-234.7 does not permit removal of the detectors to perform the SI. Also, the ionization-type detectors are interchangeable in the fire protection system in that they are tested and actuate in the same manner as photoelectric detectors.

Analysis of Event

This event is being reported in accordance with 10 CFR 50.73, paragraph a.2.i.B, as a condition that is prohibited by TSs. Ionization smoke detectors are considered unreliable in a high radiation field; therefore, TS Table 3.3-11 specifies that photoelectric smoke detectors shall be operable in the Unit 2 annulus Fire Zone 374. However, all 22 detectors were tested and did actuate, and no detector failure occurred. Because the fire detection system was operable and capable of meeting its intended function for prompt detection, this event presented no adverse effect on the health and safety of the public.

Corrective Action

The immediate corrective action was to declare the three ionization detectors inoperable, enter LCO 3.3.3.8, and establish an hourly fire watch. A potential reportable occurrence was initiated (2-89-135); and a CAQR was written to document, correct, and track the issue. A WR was written (WR-B-252908) to replace the three ionization detectors and restore compliance with the TSs. LCO 3.3.3.8 was exited at 2141 EDT on September 15, 1989.

Additionally, in 1985, the craftsmen had the responsibility for identification of the correct replacement part. Since 1985, the WR program has been revised extensively. The guidelines provided by the present program described in Sequoyah Standard Practice SQM2 give planners the responsibility for identification of the proper replacement parts. Under the present system, installation of the incorrect type of smoke detector is not likely to occur because planners research control copy drawings and vendor manuals to identify the correct replacement part. Also, since 1986, the fire protection system has been a "limited quality assurance system" as described in SQA189, which requires "items shall be identified and issued in accordance with SQA170 to ensure that only correct and acceptable items are used or installed."

Six other fire zones were inspected to determine if incorrect type detectors were installed. This inspection failed to identify any further problems.

Additional Information

There have been no previous reports of events similar in nature.