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April 24, 1992

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Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO. 50-327 - FACILITY OPERATING LICENSE DPR-77 - LICENSEE EVENT REPORT (LER) 50-327/91017, REVISION 1

The enclosed LER is being revised to update the corrective action associated with the event. The LER concerns operation with an inoperable radiation monitor because the inlet valve was left isolated. This LER was originally reported in accordance with 10 CFR 50.73(a)(2)(i)(B) on August 14, 1991.

Revisions to the LER are annotated by vertical bars in the right-hand margin.

Sincerely,

J. L. Wilson

Enclosure
cc: See page 2

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1/1

cc (Enclosure):

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NRC Form 366 (6-89)

U.S. NUCLEAR REGULATORY COMMISSION

Approved OMB No. 3150-0104
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LICENSEE EVENT REPORT (LER)

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TITLE (4) Operation With an Inoperable Lower Containment Radiation Monitor Because of the Inlet Valve Being Isolated

EVENT DAY (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 7	1 5	9 1	9 1	0 1 7	0 1	0 4	2 4	9 2		0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following)(11)			
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)
Jan Bajraszewski, Compliance Licensing	6 1 5 8 4 3 - 7 7 4 9

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)	X NO				

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

This LER is being revised to reflect a schedule change to a corrective action. On July 15, 1991, at 0820 Eastern daylight time (EDT) with Unit 1 operating in Mode 1, and 100 percent power, Radiation Monitor (RM) 1-RM-90-106, which provides lower containment atmosphere particulate and gaseous monitoring, was declared inoperable because the inlet valve was found closed. This condition was discovered by radiochemical laboratory analysts (RLAs) replacing a filter on the RM. The valve had apparently been left closed following the filter replacement the previous day. The valve was immediately opened, but the RM was not considered operable until after a functional check was conducted. A low flow alarm, which should have alerted operators to the condition, had not actuated. The alternate RM (1-RM-90-112) was aligned to lower containment at 1239 EDT. Several personnel performance weaknesses and procedure inadequacies contributed to the event. Corrective action includes additional training and revision to the procedures involved.

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

Description of Event

On July 15, 1991, at 0820 Eastern daylight time (EDT) with Unit 1 operating in Mode 1 (100 percent power, 578 degrees Fahrenheit, 2,235 pounds per square inch gauge), Radiation Monitor (RM) 1-RM-90-106, which provides lower containment atmosphere particulate and gaseous monitoring, was declared inoperable because the inlet valve was found closed. This condition was discovered by radiochemical laboratory analysts (RLAs) replacing a filter on the RM.

On July 14, 1991, at 1010 EDT, Operations had declared 1-RM-90-106 inoperable and entered the action statement of Limiting Condition for Operation (LCO) 3.4.6.1 to allow the RLAs to perform their daily filter replacement. At 1018 EDT, the filter replacement was completed, and the RM was declared operable. On July 15, 1991, the action statement of LCO 3.4.6.1 was entered at 0806 EDT for the RLAs to replace the filter. During this evolution, the RLAs discovered the inlet valve was closed. The duration of the valve being closed was determined by the examination of the RM's strip chart recorder, which indicated a drastic reduction in count rate at approximately 1020 EDT on July 14, 1991. The count rate remained at the lower level until the inlet valve was reopened on July 15, 1991, at 0820 EDT, at which time the count rate increased to be consistent with plant conditions. It was determined that compliance with the action statement of technical specification (TS) LCO 3.4 6.1 was not maintained from the time the valve was closed on July 14, 1991. Therefore, the main control room personnel entered LCO 3.0.3. The valve was opened, but the RM could not be considered operable until a functional check was conducted. A low flow alarm, which should have alerted operators to the condition, had not actuated. Additionally, the RM pump had operated over the subject period with the inlet valve closed. The alternate upper containment RM, 1-RM-90-112, was aligned to lower containment at 1239 EDT, and LCOs 3.0.3 and 3.4.6.1 were then exited.

During the time the RM was isolated, a sample was taken from the RM inlet line downstream of the isolated valve in order to support venting of containment. Because the count rate was below expected, the Chemistry shift supervisor ordered a resample. It confirmed the previous sample rate because the conditions were the same. (The RM was isolated.) The agreement between the two samples led the supervisor to conclude that Operations had performed a recent purge, and he did not pursue the unexpected results further. Additionally, in performing and reviewing Surveillance Instructions (SIs) both the on-shift senior reactor operator (SRO) and an assistant unit operator (AUO) noticed the large decrease in count rate; the SRO was aware of the filter replacement and incorrectly concluded that the filter changeout resulted in the reduced activity.

SI-137.1, "Reactor Coolant System Unidentified Leakage Measurement," fulfills TS Surveillance Requirements (SRs) 4.4.6.2.1.a to monitor the lower containment atmosphere particulate and 4.4.6.2.1.b to monitor the containment pocket sump inventory. TS SR 4.4.6.2.1.a is implemented in the SI by taking a reading of 1-RM-90-106 or 1-RM-90-112. At 1438 EDT, on July 15, 1991, Operations determined that the Unit 1

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SI-137.1 performances for the previous three shifts were not adequately completed because they were performed utilizing the isolated RM. Therefore, LCO 4.0.3 was immediately entered. At 1537 EDT the reperformance of the SI was completed, and LCO 4.0.3 was exited.

Troubleshooting on 1-RM-90-106 was conducted to determine why the low flow alarm did not actuate with the inlet valve closed. Testing revealed the alarm was functioning properly. It was postulated that an alternate flow path existed allowing sufficient bypass flow through the monitor to prevent actuation of the low flow alarm. During troubleshooting, the filter was replaced, and the flow switch was tested with the inlet valve closed. The alarm did not actuate during this test. The instrument mechanic performing the troubleshooting concluded that the filter assembly was improperly aligned allowing surrounding air to flow through the RM. Because of the design of the RM, the misaligned condition can occur and is not readily detectable. 1-RM-90-106 was verified to be functional and was returned to service at 1810 EDT.

Cause of Event

The direct cause of 1-RM-90-106 being left inoperable was failure of the RLAs to adequately verify proper valve alignment following the filter changeout. Both analysts believed they had properly realigned the RM and had signed the Technical Instruction worksheet documenting performance and second-party verification (one of these same RLAs was the individual who identified the isolated RM on July 15). However, review of the RM recorder chart clearly indicates that the RM had not been properly returned to service following the filter changeout. There were several procedural weaknesses which may have contributed to improper performance and verification.

The filter replacement procedure provides steps for returning the RM to service but does not require documentation of performance or verification of each individual action. Additionally, the administrative procedure governing procedure use was interpreted to not require having the procedure present during work performance on the basis of the activity being considered a routine task. Accordingly, documentation of the activity and return to service was not completed until after both 1-RM-90-106 and 1-RM-90-112 filter replacements were complete and the monitors were back in service. Since verification is documented after performance rather than during performance, the potential exists that the analyst may not remember the exact valves manipulated and verified, particularly if more than one filter replacement is performed.

The closed valve was not identified during the return to service (low flow alarm did not actuate) because the check provided by the procedure, i.e., check for low flow alarm, was not adequate to fully assess proper operation and response. Additionally, operators did not question the low count rate on the noble gas channel of the RM at the time the RM was returned to service. This leads to the conclusion that contrary to expectations, the RM response was not understood following the filter change out and the RM output was not verified to be consistent with pre-existing plant conditions.

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Not identifying the condition at earlier opportunities resulted from a lack of communication between the chemistry laboratory and Operations and lack of appropriate follow-up on assumptions. The SRO and Chemistry shift supervisor questioned of the observed indications, but did not communicate adequately to ensure correct resolution of the questions. The Chemistry shift supervisor assumed that a purge had occurred, resulting in the reduced activity without verifying a purge was actually preformed. The SRO and AUO concluded that the filter replacement had reduced the activity without recognizing that noble gas is not affected by the filter replacement; communication with the Chemistry laboratory could have corrected this misunderstanding of RM response.

Implicit in the personnel performance issues associated with this event, the underlying cause is considered to be lack of rigor and discipline in the performance of activities.

Analysis of Event

A primary function of the lower containment RM is to monitor and detect leakage from the reactor coolant system (RCS) pressure boundary. This monitor provides early determination of small RCS leaks (less than one gallon per minute). Other monitoring devices also provide leakage detection functions and were not affected by this event, including upper containment RMs, containment humidity monitors, reactor vessel flange leakoff temperature detectors, containment sump level monitoring, charging pump flowrate, and the volume control tank level. Of these monitoring methods, the lower containment particulate, gaseous monitors, and the containment pocket sump inventory monitoring perform leakage detection functions for small RCS pressure boundary leaks.

The absence of lower containment particulate and gaseous monitoring ability limits the operator in early identification of low-level leakage. The pocket sump inventory calculation is performed at least once every 12 hours. This inventory calculation will provide detection of small leakage, but is a frequently calculated value rather than an online reading. Should a rapid progression of a leak occur, the online monitoring methods discussed above would provide notification of the leakage to the operator.

Both the upper and lower containment RMs initiate a containment ventilation isolation (CVI), although they do not provide any primary safety functions for containment isolation as described in the SQN Updated Final Safety Analysis Report. The safety function CVI is initiated by the containment exhaust purge monitors, which remained operable throughout this event.

In summary, other methods were available to provide operators indication of increases in pressure boundary leakage. Other indicators and safeguard features were also available to monitor and isolate radioactive releases to the environment. Consequently, this event did not adversely impact the health and safety of the public or plant personnel.

Corrective Action

Upon discovery of the condition, the valve was opened. The alternate, upper containment, RM (1-RM-90-112) was aligned to lower containment on June 15, 1991, at

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1239 EDT restoring the gas and particulate monitoring function. 1-PM-90-106 was verified to be functioning properly and returned to service on June 15, 1991, at 1810 EDT. The RIAs involved were counselled on the importance of self verification. The need for communication to verify the accuracy of assumptions was also emphasized to Chemistry personnel.

This event was covered as a "lessons learned" on August 6, 1991, to reinforce expectations relative to operators pursuing questions and demanding adequate and complete responses. This event is being further reviewed with Operations personnel, emphasizing their role and responsibility. The need to ensure indications are consistent with plant conditions before and during the returning of equipment to service is the focal point of this discussion. The expected PM response following a filter replacement was covered in these discussions. The discussions with Operations personnel are complete. Additionally, simulator training is being conducted to focus on operators checking all parameters associated with a component and questioning the status of each of these parameters before making an operational judgement. This training is an enhancement to the existing training program. Four of the six groups of licensed operators have completed the simulator training. Simulator training will be conducted for the remaining groups.

The chemistry procedures, including the procedure for filter replacement, are now required to be at the work location during work performance. The administrative controls governing procedure use was revised to reinforce individual responsibilities relative to procedural compliance during routine tasks and to clarify the requirements for having a procedure present at a work location.

The filter replacement procedure was revised to include individual steps and verification of those steps for returning the monitor to service. Checking RM pump and alarm operability and verifying that RM response is consistent with plant conditions, and will also be included in this revision. Analogous revisions of other procedures are also being performed.

The design of the RM was evaluated to determine if a change should be implemented to limit the possibility of a misaligned filter assembly and increase the ability to detect this condition.

Focus on follow-through to verify the accuracy of assumptions and individual self checking is included in ongoing SQN performance effectiveness initiatives. These initiatives include emphasis on attention to detail and disseminating and reinforcing management expectations. A quality improvement team has been established to facilitate identification and resolution of quality performance impediments. Additionally, awareness meetings with principle and middle level managers are being regularly held to reinforce standards, expectations, and ownership and establish areas for improvement. It is expected that these initiatives will result in overall improvements in personnel performance.

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Additional Information

LER 50-327/88005 also dealt with a RM that was declared operable when isolated; however, the event resulted from inadequate configuration control and different plant departments and procedures were involved. Therefore, the corrective action associated with LER 50-327/88005 could not have prevented this event.

Commitments

1. The administrative controls governing procedure use will be revised to reinforce individual responsibilities relative to procedural compliance during routine tasks and to clarify the requirements for having a procedure present at a work location by September 16, 1991. - COMPLETE

2. The filter replacement procedure will be revised to include individual steps and verification of those steps for returning the monitor to service. Checking RM pump and alarm operability and verifying RM response is consistent with plant conditions will also be included in this revision by September 14, 1991. Analogous revisions of other procedures will be performed by December 1, 1991. - COMPLETE

3. The design of the RM will be evaluated to determine if a change should be implemented to limit the possibility of a misaligned filter assembly and increase the ability to detect this condition by October 1, 1991. - COMPLETE

4. These discussions with Operations personnel will be completed by September 11, 1991. - COMPLETE

5. Simulator training will be conducted to focus on licensed operators checking all parameters before making an operational judgement. This training will be conducted during the requalification training by June 19, 1992.