

LICENSEE EVENT REPORT (LER)

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|--|--------|-----------|---|-------------------|-----------------|-------|------------------|-----------|----------------|---|----------------------|---|------------------|-----|---|---|---|---|------------------|--|--|--|-----------------|--|--|
| FACILITY NAME (1) Sequoyah, Unit 1 | | | | | | | | | | DOCKET NUMBER (2) 0 5 0 0 0 3 2 7 | | | | | PAGE (3) 1 OF 0 4 | | | | | | | | | | |
| TITLE (4) Auxiliary Building Isolation | | | | | | | | | | | | | | | | | | | | | | | | | |
| 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 | 7 | 2 | 9 | 8 | 5 | 8 | 5 | 0 | 3 | 1 | 0 | 0 | 0 | 8 | 2 | 6 | 8 | 5 | Sequoyah, Unit 2 | | | | 0 5 0 0 0 3 2 8 | | |
| 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) 11010 | | | 20.402(b) | | | | 20.405(c) | | | | XX 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) | | | | XX OTHER (Specify in Abstract below and in Text, NRC Form 366A) | | | | | | | | | | |
| | | | 20.405(a)(1)(iii) | | | | 50.73(a)(2)(ii) | | | | 50.73(a)(2)(viii)(A) | | | | | | | | | | | | | | |
| | | | 20.405(a)(1)(iv) | | | | 50.73(a)(2)(iii) | | | | 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 Heyward R. Rogers, Compliance Section Engineer | | | | | | | | | | TELEPHONE NUMBER 6 1 5 8 7 0 - 6 1 4 7 | | | | | | | | | | | | | | | |
| COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13) | | | | | | | | | | | | | | | | | | | | | | | | | |
| CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | | CAUSE | SYSTEM | COMPONENT | MANUFACTURER | REPORTABLE TO NRC | | | | | | | | | | | | | | | |
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| SUPPLEMENTAL REPORT EXPECTED (14) | | | | | | | | | | EXPECTED SUBMISSION DATE (15) | | | MONTH | DAY | YEAR | | | | | | | | | | |
| YES (If yes, complete EXPECTED SUBMISSION DATE) XXX NO | | | | | | | | | | | | | | | | | | | | | | | | | |

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

On July 29, 1985, with both units at 100 percent power, an Auxiliary Building isolation occurred at 2225 CST. The isolation was automatically initiated by high radiation as indicated by Auxiliary Building stack ventilation monitor, RM-90-101. Upon the isolation, the Auxiliary Building gas treatment system started and provided filtration of effluents exiting the building to the environment. All releases were well within the offsite dose limits.

During the event, 11 people had minor contamination due to airborne radioactivity. All individuals were decontaminated.

The roving fire watch personnel were unable to make their normal rounds due to ALARA precautions.

There was no effect upon public health and safety.

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APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

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

On July 29, 1985, with both units at 100 percent power, an Auxiliary Building isolation (ABI) occurred at 2225 CST. The isolation was automatically initiated by high radiation as indicated by Auxiliary Building stack ventilation monitor, RM-90-101. Upon the isolation, the Auxiliary Building gas treatment system (ABGTS) started and provided filtration of effluents exiting the building to the environment. All releases were well within the offsite dose limits.

Prior to the event at 2140 CST, the unit 2 operator noticed a significant drop in volume control tank (VCT) level; however, pressurizer level was stable. Technical Specification Limiting Condition for Operation (LCO) 3.4.6.2 was entered, and appropriate action requirements were met. Reviews were being made of the system drawing and lineup when at 2225 CST the ABI occurred. The operator followed Abnormal Operating Instruction (AOI)-31, "Abnormal Release Of Radioactive Materials" and AOI-6, "Small Reactor Coolant System Leak." The ABI was verified to be valid and not spurious, and the shift engineer initiated evacuation of the Auxiliary Building. At 2230 CST, normal letdown and charging to the reactor coolant system were secured which stabilized VCT level and indicated that the leak was on the letdown line. During walkdown of the system, the unit 2 assistant shift engineer reported a leaking weld at a sample-line connection upstream of valve 62-674. At 2257 CST, an unusual event was declared in accordance with the radiological emergency plan (REP) due to an estimated loss of VCT level of 15 gpm. With the leak identified and isolated, the unusual event was exited, and cleanup was initiated for the approximately 600 gallons lost during the event. Attachment 1 contains a sequence of events listing covering the entire event.

During the event, 11 people were contaminated due to airborne radioactivity. The highest contamination level was 10,000 dpm on one individual's mustache. All individuals were decontaminated, and a whole body count was made to determine internal intake of activity. The results showed nondetectable activity for all 11 involved.

Subsequent to the event, air samples were taken in the unrestricted area adjacent to the Auxiliary Building, and the initial sample bomb indicated detectable levels of activity. Since this did not seem reasonable with the Auxiliary Building under a negative pressure (ABGTS still in operation), a second and third sample was taken. The second showed no activity, and the third indicated detectable levels similar to the first. The Health Physics laboratory supervisor discussed the results with the assistant section supervisor, and the unrestricted areas, including the Control Building, were roped off as a precautionary measure until further analysis could be made. All three previous samples were counted in the chemical laboratory count room as is normally done; however, as noted above, inconsistent results were found. Samples were taken from the unrestricted areas and sent to the Power Operations Training Center (POTC) located adjacent to the plant site for counting. Several samples were taken, and all indicated no activity as expected in these areas outside the Auxiliary Building. It has been determined that the chemical laboratory Gamma Ray Spectrometry background was high such that an adequate evaluation could not be made. The chemical laboratory and counting room are located within the Auxiliary Building secondary containment

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

enclosure boundary, and when the ABI occurred, background activity in the lab increased creating some inconsistencies in readings made on the air samples taken. A review of past ABIs and times of operation on the ABGTS system for venting and purging was made, and similar occurrences have been noted with use of the counting systems at these times. Management is aware of the problem and has initiated steps to move one of the Gamma Ray Spectrometry systems to an area that will not be susceptible to background activity increases during ABIs or ABGTS operation.

During the event, the roving fire watch personnel were unable to make their normal rounds while the Auxiliary Building was isolated and access limited. At 1400 CST, on July 30, 1985, fire watch routes were resumed, and no abnormalities were found. The fire watch routes were not made with the Auxiliary Building isolated due to ALARA precautions.

Sequoyah Nuclear Plant management initiated several avenues to review the leak at the sample connection on the letdown line. The plan consisted of two major efforts; (1) determination of the root cause and eliminate its source, and (2) ensure that similar lines are not leaking or going to leak. To accomplish these efforts, a metallurgical analysis of the failed line was made, vibration data was collected on the chemical and volume control system (CVCS) letdown line, and an evaluation of the history on the line is being made. To determine the possibility of similar situations in the plant, a generic evaluation is to be made, including a review of the design analyses on similar lines.

A visual examination was performed on the CVCS 3/4-inch, schedule 40, 304 stainless steel letdown sample line. The leak had initiated from a crack located in the heat affected zone of a weld. A section of the line containing the crack was removed for metallurgical analysis and sent to Combustion Engineering Metallurgical Laboratory located in Windsor, Connecticut.

The outside diameter (OD) surface was examined in the as-received condition by an optical microscope. The surface had no pitting or stress risers, and the crack appeared to be smooth with minor secondary cracking.

The fracture surface was then examined by optical and scanning electron microscopy. The fracture surface had multiple initiation sites and was a typical fatigue fracture, and there was no evidence of stress corrosion cracking. The fracture was characteristic of high cycle-low stress fatigue in the initiation site and low cycle-high stress fatigue in the remaining surface. Therefore, it has been concluded that the leak was caused by through wall fatigue cracks initiating on the OD surface.

Preliminary analysis of the unit 2 CVCS letdown line vibration data did not indicate any frequencies or amplitudes of significant values during stabilized system conditions that would cause fatigue fracture. Vibration data is presently being compiled for system transient conditions (i.e., upstream-downstream valve operation, or system flow changes) to determine if frequencies and amplitudes exist which could possibly cause fatigue failure.

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

As part of the investigation, the unit 1 CVCS sample line was examined visually and by liquid penetrant examination of the weld area. There were no flaws or indications noted that caused question of the line's structural integrity. However, subsequent to the unit 2 event, on August 11, 1985, a small leak was noted on the U1 sample line. Operators isolated the line, and the line was removed for examination. The results of the analysis have not been received from an independent contractor; however, preliminary results indicate that the failure mechanism is similar to that of the unit 2 line. The unit 1 event presented no airborne problems, and this event is not reportable per 10 CFR 50.72 or 50.73.

The following corrective actions have been taken or will be implemented to resolve the branch line failures:

1. The lines were replaced with equivalent piping.
2. A support was added to each line.
3. Analysis is continuing on similar branch lines.
4. Vibration data is being collected and analyzed to determine source of failure mechanism.
5. Similar lines will be monitored to provide early warning of similar failures.

With these actions in place, it is believed that a final fix can be obtained. The failure of these lines presented no safety threat to the plant, and such a failure is within the bounds of the safety analysis. All offsite releases were within acceptable limits, and there was no effect upon public health and safety. This is the first occurrence of this nature at Sequoyah.

ATTACHMENT 1
SAMPLE LINE LEAK SEQUENCE OF EVENTS

2140 Operator notice volume control tank (VCT) level decreasing - pressurizer level stable - entered 3.4.6.2 on unidentified leakage

2200 Shift change

2225 Enter AOI-31 (due to Auxiliary Building isolation (ABI)), AOI-6 (inventory) received ABI - verified true ABI and evacuated Auxiliary Building (AB) - entered 3.3.3.10 - fire watch noted an increase in temperature in unit 2 pipe chase

2230 Secured normal letdown and charging - VCT level stabilized - exit 3.4.6.2 notified Health Physics (HP) and Chemical Lab

2234 Assistant shift engineer (ASE) reported two electricians leaving pipe chase who reported a steam leak in pipe chase

2245 734 elevation posted as airborne area

2250 ASE and assistant unit operator (AUO) entered pipe chase (690)

2255 ASE reported a leaking weld at sample line upstream of 62-674

2257 Declared IP-2 (unusual event) due to estimated loss of VCT of 15 gpm

2325 Exit IP-2; leak identified and isolated

2330 All AB entrance doors posted "Airborne"

2343 Notified NRC red phone of IP-2 event

2358 Notified NRC Resident (Watson)

0018 Steve Weise called U2 ASE for confirmation of event

0030 Essential raw cooling water (ERCW) radiation monitor inoperable due to background LCO 3.3.3.9

0043 Reset ABI to allow H₂ supply valves to AB to open (FCV-77-241) - RM-90-101A blocked

0055 2 HCV-62-686 isolated for H₂

0100 VCT level returned to normal - AB radiation level had stopped increasing

0230 Air samples taken by HP in AB

0245 Air samples given to Chemical Lab for counting

0415 Started pulling air samples in unrestricted areas at elevation 690 in the Service Building

0425 Pulled air sample at door A56, elevation 690, regulated area outside AB, and sent to Chemical Lab

0442 Chemical Lab counted air sample from regulated area outside of ABSCE boundary at A56 (used this sample to notify section engineer (SE) of potential airborne outside ABSCE at 0530 CST)

0500 Completed pulling air samples of unrestricted areas and sent to Chemical Lab

0530 HP notified main control room (MCR) that Xe 133 in unrestricted area is 1.919×10^{-6} μ cu/cc (based on sample at 0442 CST) - second sample requested

0530 RM-90-101A out of block (ABI still in) - VCT H₂ completely isolated

0535 Had Chemical Lab check counters after discussion with SE

0551 Chemical Lab counted a second air sample near A56 regulated area (outside ABSCE boundary), elevation 690, and results showed 0 activity

0709 HP pulled third sample of regulated area near A56 (outside ABSCE boundary) and Chemical Lab counted - showed some activity

0750 HP posted elevation 690 in the Service Building at HP dosimetry desk as airborne and roped off area

0753 HP reported control room (CR) as a potential airborne area and posted as such

0808 RM-90-101A reset

0816 MCR isolation by manual initiation to start cleaning process

0850 Second ABI on RM-90-101B trying to reestablish normal ventilation (SOI-30.5D)

0909 Third ABI on RM-90-101B same as above

0915 Notified NRC of high Xe 133 in unrestricted areas per 50.72.b.2.iv.a

0922 Fourth ABI on RM-90-101B same as above

0949 Aligned AB ventilation normal per SOI-30.5D

1110 MCR airborne clean per HP

1135 Notified NRC that high radiation in unrestricted area was in error due to high background in count room

1206 Follow-up phone call to NRC on ABIs while trying to put ventilation back in

TENNESSEE VALLEY AUTHORITY
Sequoyah Nuclear Plant
Post Office Box 2000
Soddy Daisy, Tennessee 37379

August 27, 1985

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

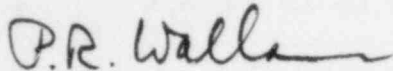
Gentlemen:

TENNESSEE VALLEY AUTHORITY - SEQUOYAH NUCLEAR PLANT UNIT 1 - DOCKET NO.
50-327 - FACILITY OPERATING LICENSE DPR-77 - REPORTABLE OCCURRENCE REPORT
SQRO-50-327/85031

The enclosed licensee event report provides details concerning an engineered safety feature actuation of an Auxiliary Building isolation occurring on July 29, 1985. This event is reported in accordance with 10 CFR 50.73, paragraph a.2.iv.

Very truly yours,

TENNESSEE VALLEY AUTHORITY



P. R. Wallace
Plant Manager

Enclosure
cc (Enclosure):

J. Nelson Grace, Regional Administrator
U.S. Nuclear Regulatory Commission
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

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

NRC Inspector, NUC PR, Sequoyah

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