LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | T N S N P 1 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | (5)

LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

CONT 0 1 | REPORT SOURCE L (6) | 0 5 0 0 0 3 2 7 (7) | 0 2 1 1 8 1 (8) | 0 6 3 0 8 1 (9)

DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 | Unit 1 in mode 5. The unit operator stopped reactor coolant pumps 1 and 2. Since

0 3 | reactor coolant pumps 3 and 4 and residual heat removal pump B were also not in

0 4 | service at this time, the unit entered LCO 3.4.1.3.a and LCO 3.4.1.3.b. There was

0 5 | no effect upon public health or safety. Previous occurrences - none.

0 6 |

0 7 |

0 8 |

0 9 | SYSTEM CODE: C B (11) | CAUSE CODE: X (12) | CAUSE SUBCODE: Z (13) | COMPONENT CODE: P U M P X X (14) | COMP. SUBCODE: B (15) | VALVE SUBCODE: Z (16)

(17) LER/RO REPORT NUMBER: EVENT YEAR 8 1 | — | SEQUENTIAL REPORT NO. 0 2 1 | / | OCCURRENCE CODE 0 3 | REPORT TYPE X | — | REVISION NO. 1

ACTION TAKEN: X (18) | FUTURE ACTION: Z (19) | EFFECT ON PLANT: Z (20) | SHUTDOWN METHOD: Z (21) | HOURS (22): 0 0 0 0 | ATTACHMENT SUBMITTED: Y (23) | NPRD-4 FORM SUB.: N (24) | PRIME COMP. SUPPLIER: N (25) | COMPONENT MANUFACTURER: W 1 2 0

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 | The unit operator stopped reactor coolant pumps 1 and 2 for pump protection when the

1 1 | RCS pressure went to zero after the RHR containment spray isolation valve was inadver-

1 2 | tently opened. The RHR A pump was running prior to the opening of the valve and the

1 3 | RHR B pump was started approximately 4 minutes after the valve was opened. Reactor

1 4 | coolant pumps 1 and 2 were returned to operable status in approximately one hour.

1 5 | FACILITY STATUS: X (28) | % POWER: 0 0 0 (29) | OTHER STATUS (30): NA | METHOD OF DISCOVERY: Z (31) | DISCOVERY DESCRIPTION (32): NA

1 6 | ACTIVITY RELEASED: Z (33) | CONTENT OF RELEASE: Z (34) | AMOUNT OF ACTIVITY (35): NA | LOCATION OF RELEASE (36): NA

1 7 | PERSONNEL EXPOSURES — NUMBER: 0 0 0 (37) | TYPE: Z (38) | DESCRIPTION (39): NA

1 8 | PERSONNEL INJURIES — NUMBER: 0 0 0 (40) | DESCRIPTION (41): NA

1 9 | LOSS OF OR DAMAGE TO FACILITY — TYPE: Z (42) | DESCRIPTION (43): NA

2 0 | PUBLICITY — ISSUED: N (44) | DESCRIPTION (45): NA

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NRC USE ONLY

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Tennessee Valley Authority
Sequoyah Nuclear Plant

LER SUPPLEMENTAL INFORMATION

SQRO-50-327/81021, Revision 1

Date of Occurrence: 2/11/81

Summary Description of Events Leading to Stopping Reactor Coolant Pumps 1 and 2

Summary

On February 11, 1981, the unit was operating in cold shutdown (mode 5) with the reactor coolant system temperature at 179°F and pressure at 310 psi. At 1931 CST, the residual heat removal (RHR) containment spray was inadvertently initiated when an assistant unit operator (AUO) opened valve 1-FCV-72-40, which isolates the RHR system from the containment spray header. The spray continued for approximately 35 minutes releasing approximately 40,000 gallons of primary water and 65,000 gallons of refueling water storage tank water to the containment building.

Events Leading Up to Spray

During the day shift, the isolation valve (1-FCV-72-40) was opened and then closed (stroke tested) to comply with surveillance requirements of the technical specifications. Following the testing of certain valves, an AUO is usually sent to the valve location to assure the valve is completely closed and manually close the valve if needed. However, the valve was stroke tested toward the end of the day shift and the oncoming unit operator (UO) for the evening shift was therefore informed, during the shift change, that this action needed to be completed. During the shift change, it was also suggested to the oncoming UO that he place RHR "B" train back in service. To accomplish this, he needed locally operated valves 1-HCV-74-37 and 1-HCV-74-531 to be opened.

The UO instructed the AUO to open valves 1-HCV-74-37 and 1-HCV-74-531 and to tighten down and verify closed valve 1-FCV-72-40. The AUO later called the UO in regard to the RHR valves. The UO told him that he needed those valves opened to put the "B" train of the RHR system in service (No valve numbers were mentioned during this telephone conversation). The AUO then opened valves 1-HCV-74-37 and 1-HCV-74-531 and proceeded to the location of the spray isolation valve 1-FCV-72-40. Upon arriving at the valve location the AUO attempted to call the UO before taking action on the valve, but the phone in the area was not working. The AUO then opened the isolation valve and started the containment spray.

Events Immediately Following The Spray Initiation

At 1931 the UO received alarms indicating a rapid decrease in pressurizer level and pressure. The UO notified the Shift Engineer (SE) of the condition and then tripped reactor coolant pumps 1 and 2 (pumps 3 and 4 were not running). The situation was diagnosed as a possible loss of coolant accident (LOCA) and emergency operating instruction (EOI) 0 and 1 were consulted. The UO announced over the public address system that all employees should evacuate the containment.

Health Physics and Public Safety were notified of the situation and their aid requested. Containment purge was stopped, and a path from the refueling water storage tank (RWST) to the charging pump suction was opened in an attempt to reestablish pressurizer level. RHR suction to the RWST was opened and pressurizer level started to rapidly increase.

At 1948 CST the Radiological Emergency Plan (REP), IP-4 was implemented. The evacuation alarm was sounded and an announcement for all employees to assemble in designated areas was made. Accountability was initiated and plant access control was established.

At 2009 CST manual isolation of the auxiliary building was initiated, safety injection system pump A and centrifical charging pump B were started.

At 2014 CST the AUO, who opened the isolation valve, entered the control room with another UO discussing the valve. At this time the control room employee checked the indicator light and verified it was indeed open. The valve was shut and IP-4 was terminated. The NRC duty officer was notified of the events at 2030 CST.

Summary Conclusions

1. The plant was operated to adequately protect the reactor core and the public health and safety.

2. The primary cause was a lack of adequate oral communications which was corrected before the unit returned to power operation. A secondary cause was the lack of sufficient break-in of the AUO on the particular work station to which he was assigned. This was also corrected before unit start-up.

Corrective Actions

Shortly following the RHR incident, a thorough investigation was performed that included the following:

1. Critique of the incident and a collection of written or oral statements by the principals involved in the incident immediately after the accident.

2. Assignment of a Task Director to perform an independent evaluation of the incident and provide recommendations to the Plant Superintendent and the Nuclear Power Assistant Director of Operations on lessons learned.

3. The Plant Superintendent and the Assistant Plant Superintendent met with all shift engineers to further identify those areas in which increased direction and controls were considered necessary in order to improve the shift engineer's control over shift activities.

4. Approximately 23 assistant unit operators were interviewed in order to receive a cross section of the general views of this specific classification in such areas as competence to man shift positions, general work attitudes, relationships with other shift classifications, and their understanding of the duties and responsibilities of the AUO classification.

5. The assistant plant superintendents from Sequoyah and Watts Bar and a representive from the NUC PR Assistant Director's (Operations) Office met with approximately four SE's, four ASE's and eight unit operators to discuss methods of shift organization and controls to improve shift performance.

6. The Superintendent and Operations Supervisor from Browns Ferry and the Superintendent from Watts Bar were consulted and their inputs included in our evaluation.

This initial investigation subsequently resulted in the following actions:

In order to clarify the duties and responsibilities of the shift employees including the shift engineer, the structure of the operating shift has been revised and issued. The general responsibilities and authorities of each position are described in the job description provided to the individuals when they are appointed to the position. Administrative Instruction AI-2 has been revised to describe the responsibilities and authorities of each operating station.

AI-2 and AI-30 clearly state that the shift engineer is in direct charge of plant operations and he, or his representative, must give permission for any activity that may affect plant equipment. We have met with all the shift engineers and have stressed to them that they are responsible for all operations and their shift and that they have authority to terminate any activity that they believe threatens plant safety or exceeds their span of control. We have emphasized this in training meetings with each shift and with all other sections in the plant who perform work that affects plant safety or the configuration of the plant.

In order to improve communications between shift personnel and between shift personnel and management, we have provided clearer lines of communication between operating positions within a shift as well as between operating shifts and other sections by revising the shift structure, clarifying the communication paths, establishing work location routines, improving the maintenance of telephones, and investigating additional or different radio communications. This was all completed by May 1, 1981.

We have expanded our instructions on the use of written and oral instructions and conducted training of the shift crews. This was done prior to restart of the unit. A training program on oral communications has been developed by the Instructor Training and Staff Development and will be administered to all licensed operators at Sequoyah Nuclear Plant. This course will be administered to all non-licensed personnel on the operations staff. A DPM is being drafted to establish guidelines for this training at all TVA nuclear plants.

We have improved the environment in the main control room by closer supervision and compliance with established policies regarding conduct, access, and housekeeping.

The Assistant Superintendent and Operations Supervisor met with each shift crew before restart to emphasize the conduct required by AI-2. These discussions stressed clear communications, control room atmosphere, authorities and responsibilities of operating personnel and status control of safety related systems. Discussions were also held with all key supervisors emphasizing the requirements to keep the SE informed of work in progress and his responsibility to keep control of activities affecting safety.

An in-plant on-the-job training and certification system of non-licensed operating personnel has been established so that, when our evaluation of non-licensed operators at the plant shows that an individual is not qualified to man a particular work station in the plant because of lack of operating experience or on-the-job training, a break-in time is provided under the instruction of a qualified individual. Following the period of training, an oral examination shall be given to establish that the training has been adequate to qualify the trainee to competently and safely man the work station. The examination will be administered by a qualified operator other than the operator serving as instructor. If the results of the examination are unsatisfactory, the trainee will be put back into training for whatever additional period of time is required to qualify him for the position through subsequent oral examination or he will be restricted from assuming responsibility for the particular work location.

This examination will be documented and attested to by both examiner and examinee. The shift engineer will be provided with a qualification status list consisting of operator names and job positions for which they are qualified. He will fill work positions and make job assignments in compliance with this list. The qualification status list will be updated periodically by the Supervisor, Operations Section, and provided to the shift engineer.

All future non-licensed operating employees will, upon assignment to Sequoyah, receive on-the-job break-in training and examinations before assuming responsibility for any job position. A Sequoyah Standard Practice describing this break-in has been issued and implemented.

In order to assure that only qualified employees are assigned to perform functions that can affect the safety of operations, we have evaluated our non-licensed operating employees, specifically the assistant unit operators and fourth-period student operators, to determine each individual's qualifications and competence in regard to performing operating functions that can affect the safety of operations.

This evaluation was accomplished as follows:

1. Reviewed previous shift manning schedules and operating logs to determine the actual operating experience of each individual operator at each plant operating station.

2. Each shift engineer (SRO) was consulted for an opinion of individual qualifications to support the effectiveness of operating experience determined in item 1 above.

3. Each operator was consulted for a self-evaluation of qualifications to support or refute the conclusions of items 1 and 2 above.

The result of this evaluation is a qualification status list which reflects the spectrum of non-licensed operating personnel's operating experience at Sequoyah. This list will be used to fill vacant shift positions.

All of the above actions and plans are being reviewed for applicability to other TVA nuclear facilities. They have been discussed at a plant superintendents' meeting to assure that all plants are aware of these programs and proper consideration be given to implementing these at other TVA nuclear plant facilities.