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April 8, 1992

DUKE POWER

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

Subject: McGuire Nuclear Station Unit 1
Docket No. 50-369
Licensee Event Report 369/92-01, Revision 1

Gentlemen:

Pursuant to 10 CFR 50.73 Sections (a) (1) and (d), attached is Licensee Event Report 369/92-01, Revision 1 concerning failure to remove a steam generator tube from service. This report is being submitted in accordance with 10 CFR 50.73 (a) (2) (i). This event is considered to be of no significance with respect to the health and safety of the public.

Very truly yours,

Tony P. McConnell for

T.C. McMeekin

TLP/bcb

Attachment

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U.S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D.C. 20555

Mr. P.K. Van Doorn
NRC Resident Inspector
McGuire Nuclear Station

IE22

LICENSEE EVENT REPORT (LER)

FACILITY NAME(1)	DOCKET NUMBER(2)	PAGE(3)
McGuire Nuclear Station, Unit 1	05000 369	1 OF 14

TITLE(4) A Technical Specification Violation Occurred Because Of Failure To Remove A Steam Generator Tube From Service, As Necessary, During the Unit 1 End Of Cycle 7 Refueling Outage.

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(8)
									McGuire, Unit 1	05000 369
1	28	92	92	01	1	4	08	92		05000

OPERATING MODE(9)	1	THIS REPORT IS SUBMITTED PURSUANT TO REQUIREMENTS OF 10CFR (Check one or more of the following)(11)					
		50.402(b)		20.405(c)		50.73(a)(2)(iv)	73.71(b)
POWER LEVEL(10)	97%	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)
		20.405(a)(1)(iii)	X	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
Terry L. Pedersen, Supervisor, McGuire Safety Review Group	AREA CODE 704 875-4487

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	
B	AB	SG	W120	Y							

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 January 16, 1992, at 1912, Operations Control Room personnel commenced an orderly shutdown of Unit 1, as a result of primary to secondary system leakage, which had increased to approximately 235 gallons per day, on Steam Generator (SG) 1D. Prior to the shutdown, Unit 1 was operating in Mode 1 (Power Operation) at 97 percent power. Unit 1 was taken off line at 0649, January 17, 1992, and entered Mode 5 (Cold Shutdown) on January 18, 1992, at 0552. The leakage was attributed to SG tube 47-46, leaking 30 drops per minute at secondary side head pressure, and SG tube 36-30, leaking 2 drops per minute at 180 psig above head pressure. Subsequent investigation of the event determined that SG tube 47-46 had a flaw indication in excess of the Technical Specification limit of 40 percent. Tube 36-30 leakage was attributed to an inadequate kinetic weld bond. Reevaluation of Motorized Rotating Pancake Coil (MRPC) Eddy Current Test (ECT) data collected during the 1991 End Of Cycle (EOC) 7 refueling outage, revealed that the indication on tube 47-46 existed at that time and was greater than the 40 percent through wall limit. This event has been assigned causes of Inappropriate Actions and a Management Deficiency. Duke Power personnel and industry experts conducted an extensive historical ECT data review, acquired additional MRPC data, and developed more conservative criteria for determining which tubes to repair. Based on the revised conservative criteria, tubes 47-46 and 36-30 were plugged, along with other tubes exhibiting crack-like indications, located in SGs 1A, 1B, 1C, and 1D.

EVALUATION:

Background

The Reactor Coolant (NC) system [EIIS:AB] transfers heat generated in the Reactor [EIIS:RCT] Core to the Steam Generators (SGs) [EIIS:SG] where steam is produced to drive the Main Turbine Generator [EIIS:TG]. The NC system contains Westinghouse Model D-2 vertical shell, U-tube evaporator [EIIS:EVP] SGs. There are approximately 4700 tubes in each SG. The Reactor Coolant flows through the inverted U-tubes, entering and leaving through the nozzles [EIIS:NZL] located in the hemispherical bottom head of the SGs. The head is divided into inlet and outlet chambers by a vertical partition plate extending from the head to the tube sheet. Manways are provided for access to both sides of the divided head. The U-tubes and the divider plate are Inconel, and the interior surfaces of the Reactor Coolant channel heads and nozzles are clad with austenitic stainless steel. The primary side of the tube sheet is weld clad with Inconel.

Eddy Current Testing (ECT) which is used mainly for thin materials, is a nondestructive test technique based on inducing electrical currents in the material being inspected and observing the interaction between the currents and the material. Eddy currents are generated by electromagnetic coils [EIIS:CL] in the test probe, and monitored simultaneously by measuring probe electrical impedance.

In addition to flaw inspection, ECT can be used to indirectly measure mechanical and metallurgical characteristics which correlate with electrical and magnetic properties. Geometric effects such as thickness, curvature and probe to material spacing influence eddy current flow and can also be measured.

Virtually everything that affects eddy current flow or otherwise influences probe impedance has to be taken into account to obtain reliable results. Therefore, credible ECT requires a high level of operator training and awareness.

Technical Specification (TS) 3.4.6.2 states Reactor Coolant leakage shall be limited to 1 gallon per minute (GPM) total primary to secondary leakage through all SGs and 500 gallons per day (GPD) through any one SG.

TS 3/4.4.5, Surveillance Requirement 4.4.5.4a.6 states the repair limit of a SG tube is defined, in part, as the imperfection depth at or beyond which the tube or sleeve [EIIS:SLV] shall be removed from service by plugging or repaired by sleeving and is equal to 40 percent of the nominal tube or sleeve wall thickness.

On March 7, 1989, SG 1B on Unit 1, developed a tube leak on SG tube 18-25. (documented on LER

369/89-04). As a result of this leak, an extensive Eddy Current Test (ECT) program, in addition to the required TS surveillance was initiated, on Units 1 and 2. All SG tubes are 100 percent bobbin coil tested during each refueling outage (RFO) resulting in the establishment of an extensive database.

Description of Event

Prior to the Unit 1 shut down on January 16, 1992, Chemistry personnel performed several normal surveillance primary to secondary leak rate calculations as directed by procedure CP/0/B/8100/45, Chemistry Procedure for Calculation of Primary to Secondary Leak Rate (Enhanced Leak Rate Monitoring Program). The results of these calculations showed an increase in primary to secondary leakage from January 8, 1992, to January 15, 1992. The leakage on SG 1D had increased from 8.3 GPD to 20 GPD. Accelerated sampling and leak rate calculations revealed that the leak had increased to 22 GPD on the morning of January 16, 1992.

At approximately 1545, Control Room [EIIS:NA] personnel received a Trip 2 (setpoint at which a conservative controlled action takes place) indication on the Condenser [EIIS:COND] Air Ejector Radiation Monitor [EIIS:RI] (EMF-33). Ten minutes later, they received a Trip 2 indication on the SG Blowdown Recycle (BB) Effluent Radiation Monitor (EMF-34). Samples were pulled and analyzed by Chemistry personnel, at 1747 and 1835. The leakage on SG 1D was calculated at 250 GPD and 220 GPD, respectively. At 1912, Operations (OPS) Control Room personnel commenced the orderly shutdown of Unit 1 as a result of the tube leak on SG 1D. Prior to the shutdown, Unit 1 was in Mode 1 (Power Operation) at 97 percent power. While the tube leakage was well below the TS limit of 500 GPD through any one SG, it was conservatively decided by Station Management to shutdown the unit.

Unit 1 was taken off line at 0649, on January 17, 1992. The Unit entered Mode 5 (Cold Shutdown) on January 18, 1992, at 0552. The NC system was drained to centerline, and the manways on SG 1D were removed. By visual inspection, it was determined that tube 47-46, located on the Cold Leg side of the SG, was leaking at about 30 drops per minute due to secondary side head pressure. When the secondary side pressure was increased by 180 psig, it was discovered that a second tube was leaking. SG tube 36-30, located on the Hot Leg side of the SG, was leaking approximately 2 drops per minute. SG tube 36-30 had been sleeved during End Of Cycle (EOC) 7, in 1991. Pressure was again increased in SG 1D. SG tube 47-46 leakage increased slightly, however, SG tube 36-30 leakage remained constant. There were no additional tubes found to be leaking at that time.

As a result of the tube leakage, selected Duke Power Company personnel and industry experts were assembled to form a SG Team. They were responsible for developing an action plan to evaluate the SG tube leaks.

Tube 36-30 Action Plan: SG tube 36-30 was tested full length using the bobbin coil test method during the SG tube leak in March, 1989, and during the RFOs in 1990 and 1991. The Motorized Rotating Pancake Coil (MRPC) test method of the tube sheet region was also conducted during the 1990 and 1991 RFOs. During EOC 7 in 1991, a tube indication was identified at the secondary face of the tube sheet. At that time, the tube was sleeved using a kinetically welded 17 inch long sleeve. Post inspections of the sleeve revealed no anomalies. (It should be noted that SG tube sleeves are structurally qualified with no credit taken for weld bonds.) Using this information, SG Team personnel developed the following action plan:

ECT the tube and sleeve of tube 36-30 using the bobbin coil and MRPC test method to locate and characterize the leak.

Perform ultrasonic testing of the sleeve in tube 36-30.

Perform visual inspection of the sleeve in tube 36-30.

Perform ultrasonic testing on sleeves installed just before and after the sleeve in tube 36-30.

Perform ultrasonic testing of a random sample of sleeves in SG 1D.

Review the installation records on SG 1D for anomalies.

Remove tube 36-30 from service.

The results of the action plan for tube 36-30 revealed the following information. The leak was discovered to be in the tube to sleeve joint. It was determined by the SG Team that the sleeve was leaking at the bottom kinetic weld due to an inadequate weld bond. The most probable cause was insufficient cleaning of the tube surface in preparation of the sleeve installation, since the cleaning instrument had broken while being used to clean the next tube, tube 36-31. There were no defects identified in the tube or sleeve. There were no anomalies identified in the installation process of the sample sleeves, or the sleeves installed before or after tube 36-30. An examination of the sample sleeves in the SG did not reveal any other problems. Tube 36-30 has been plugged.

Tube 47-46 Initial Action Plan: ECT of SG tube 47-46 using the bobbin coil test method was performed during the Unit 1 SG tube leak outage in March, 1989, and again during Unit 1 EOC 6, in 1990. At that time there were no indications noted. In October, 1991, during EOC 7, a 1.7 volt amplitude tube indication was observed from the bobbin coil test. The tube indication was classified as a Manufacturing Burnishing Mark (MBM). The tube then underwent

MRPC testing, however, the results of the MRPC testing were not fully evaluated and the tube remained in service. ECT Management and Support Engineering personnel, after evaluating MRPC test data acquired on tube 47-46 during this outage, have determined that the indication from October, 1991, was incorrectly classified. As a result, the SG Team personnel developed the action plan listed below:

Run bobbin coil and MRPC testing on tube 47-46 to verify the leak and location.

Run MRPC on all outside diameter (OD) tube indications in SG 1D

Visually inspect tube 47-46 from the primary side of the SG.

Review selected historical ECT data from the SGs including the eddy current analysts resolutions on all bobbin coil data which showed free span (the area where the tubes are not supported by a tube support plate [TSP] or tube sheet) OD tube indications.

Remove from service all tubes in the SGs identified in the selected historical data review and by MRPC testing which have free span indications.

Review ECT data on OD indications in the TSP and U-bend area.

Pull tube 47-46 for metallurgical analysis during Unit 1 EOC 8. (The tube was not pulled during this outage due, in part, to concerns with leaving Unit 1 in mid-loop operation for an extended period of time.)

ECT of tube 47-46 revealed that the tube indication which caused the leak was a 1 inch long axial indication located approximately 5 inches above the 20th TSP. The SG Team initially identified 77 tubes in the 4 SGs which would need to be plugged. These tubes were identified as having indications in the free span area, the same as the indication on tube 47-46. MRPC testing was performed on 63 randomly selected tubes in the general vicinity of the leaking tube, 47-46. The MRPC testing was performed up to the 19th TSP. A review of the bobbin coil data gathered during this outage, revealed auditional tube indications on tube 47-46, between the 14th and 15th TSPs. MRPC testing was performed on the tube indications, and the results revealed the indications to be similar to the leak defect. MRPC testing of the largest indication sized it to be 60 percent through wall (TW). A review of the 1991 EOC 7 ECT data for SG 1D revealed some evidence of the tube indication was present at that time, however, the amplitude was small, and was characterized as NDD (no detectable defect). Another 25 tubes located on the Cold Leg side were selected for full length MRPC testing. Thirteen tubes were from the same heat (same manufacturing group) as tube 47-46. Twelve tubes were from the same heat as tube 18-25 (from the tube leakage outage in March, 1989). During the

examination and evaluation, the SG Team personnel realized the need existed to revise the initial action plan. Revision 1 was as follows:

Develop a revised conservative criterion for analyzing bobbin coil data with the help of the results of the MRPC test data collected from the above mentioned tubes. This criteria would identify all tube indications with characteristics similar to the 60 percent TW tube indication discovered on tube 47-46.

Train and qualify, by test, all analysts on the new conservative criteria.

Re-evaluate 1991 EOC 7 ECT bobbin coil data on the SGs, using the new conservative criteria.

To prevent overplugging of the SG tubes as a result of the new conservative criteria, the following process was used to further screen the tube indications in the above process, using SG 1D as the evaluation SG:

Reanalyze all SG 1D EOC 7 bobbin coil data first.

Tube indications identified from the bobbin coil data reanalysis for further review will be ECT using the MRPC test method. The results of the ECT, along with the existing 1991 EOC 7 bobbin coil data, will be analyzed by recognized technical experts within Duke Power and the industry. The analysis will be used to validate one of the following methodologies that will be used to determine the tubes to be removed from service:

1) Perform the MRPC test method on all tube indications flagged from the bobbin coil analysis that cannot be resolved by detailed expert review or,

2) Perform historical review comparison of bobbin coil data (1989, 1990, 1991) to identify any tube indications that are changing over time.

With the results of the analysis process, develop a tube plugging list to remove from service all suspect tubes.

Once the analysis process was complete on SG 1D, a conclusion was reached by the SG Team personnel and industry experts that both methods of evaluating the tube indications were valid and either or both could be used to evaluate the tube indications on remaining SGs, 1A, 1B, and 1C.

A decision was then made by Station Management and SG Team personnel to evaluate and disposition the remaining SG tubes using the MRPC test method, as mentioned above. There would be, however, several exceptions to using the MRPC test method because of accessibility of tubes and readability of data:

The MRPC test method would be used on accessible tube indications. This would cover approximately 80-95 percent of the tube indications in the 4 SGs.

SG tubes not accessible due to manipulator limitations would be dispositioned using the historical review of the bobbin coil data.

MRPC test data that is not readable would not be rerun, but a historical review of the tube in question would be used for dispositioning.

When historical data is used to disposition a tube, written criteria from a recognized industry expert would be used in the evaluation process.

With the revised action plan implemented, the number of special interest tubes (tubes flagged for additional examination and analysis) identified were as follows:

SG 1A - 321
SG 1B - 244
SG 1C - 303
SG 1D - 284

Of the tubes identified, there were approximately 30 tubes per SG that were plugged. The 77 SG tubes initially identified for plugging under the original criteria, dropped to 64 when evaluated under the new conservative criteria and were included in the plugging.

The new conservative criteria used to disposition Unit 1 SG tubes was also used to disposition the SG tubes being evaluated on Unit 2 during EOC 7. Four special interest tubes were identified on Unit 2 which showed characteristics similar to tubes 18-25 (from the March, 1989 tube rupture) and tube 47-46. Three of the tubes, which are located in SG 2C, have been pulled for further laboratory analysis. The fourth tube located in SG 2D was plugged because it is located at the transition point of the U-bend and would be difficult to remove. At this time, analysis of the pulled tubes is still in progress.

Unit 1 entered Mode 1 on February 20, 1992.

Conclusion

This event is assigned a cause of Inappropriate Action because the Support Engineer responsible for the disposition of the SG tubes, failed to identify SG tube 47-46 for plugging, which would have removed it from service during Unit 1 EOC 7, in 1991. This tube contributed to the SG leak causing Unit 1 to be shutdown on January 17, 1992. When the Support Engineer received the tube results list, or "defect list" from the data analysts during EOC 7, he requested additional examination of the indication on tube 47-46. Tube 47-46 was therefore examined using the MRPC test technique. The MRPC technique provides a more detailed inspection of the SG tube. The MRPC data provides the shape of a tube indication but does not give the depth. The MRPC data was evaluated by primary, secondary, and resolution analysts and recorded as an ODI (outside diameter indication). These results were sent to the Support Engineer for disposition. At that point, the information received on the indication for tube 47-46 did not receive the appropriate evaluation by the Support Engineer, and was therefore, not identified for plugging. A contributing cause to this inappropriate evaluation was an inadequate number of qualified resources to handle the volume of FCT data.

This event has also been assigned a cause of Management Deficiency because there are no administrative controls in place to address the dispositioning process. However, the results of the disposition are clearly documented. Even though the process is subjective in character, it does require expertise and experience. The Support Engineer has the responsibility of maintaining SG tube integrity by making structural decisions on those tubes.

A cause of Inappropriate Action is assigned because the resolution of the tube indication was not the best alternative. During Unit 1 EOC 7, in 1991, the data analysts were reviewing the bobbin coil data on the SGs. An indication on SG 1D, tube 47-46 was flagged by a primary reviewer. The same indication was independently flagged by a secondary reviewer. The primary reviewer classified the indication as signal to noise (S/N), and additionally classified it as an MBM. A classification of S/N contends there is degradation, however, the S/N ratio is so small, the depth of the degradation cannot be quantified. Further classifying the indication as an MBM was based on the characteristics of the signal, and the primary analyst felt the phase angle was not a true representation of the depth of the indication. The secondary reviewer classified the indication as 85 percent TW. This was also based on the characteristics of the signal. As a result of the differing classifications, the indication was sent for resolution by a resolution team. The resolution team consists of a lead person from the primary and secondary data analysts. Ideally, these persons would be different from the original primary and secondary analysts. The resolution team evaluating the same data as the primary and secondary analysts, misclassified the indication as an MBM. The signal from the tube indication is very similar to the signal generated from an MBM. However, an MBM can be traced back to previous ECT data and normally

the voltage on an MBM is less than 1 volt. The voltage on this indication was 1.7 volts. During the investigation, a review of previous data did not indicate the presence of an MBM. It is reasonable to believe the indication would have been correctly classified if it had received closer scrutiny.

As a result of this event, tubes 36-30 and 47-46 were plugged and the criteria used for evaluating bobbin coil data was conservatively revised. The revision led to the reevaluation of the EOC 7 bobbin coil data. This resulted in plugging of additional SG tubes, as a conservative measure, during the tube leak outage. There were three tubes pulled from SG 2C for laboratory analysis. In addition to these actions, there has been additional resources assigned to support the process of dispositioning. Administrative controls will be developed to address Support Engineerings role and authority in the disposition process. ECT Analysis Management personnel will alter the activities of the resolution data analysts during RFOs, to allow the analysts to focus in on their duties. The ECT guidelines will be revised by ECT Analysis Management personnel to clarify the use of MBM and other discontinuity codes. The ECT guidelines will also be revised to delete the S/N limits of 5 to 1 that may lead to a lack of conservatism in the eddy current results. Training of the data analysts will be separated into two groups - primary and secondary analysts, and lead or resolution team analysts. A review by ECT Analysis Management personnel of ECT procedures will take place with enhancements made as necessary. Administrative controls will be developed to address the manner in which information on SG tubes is conveyed to Support Engineering for tube disposition and lastly, a Human Performance Enhancement System (HPES) evaluation will be submitted by a Human Performance Enhancement Team member to Duke Power Management to address the human factors affecting this event.

A review of the Operating Experience Program Database for 24 months prior to this event revealed 21 LERs which were attributed to Inappropriate Actions and/or Management Deficiencies resulting in TS violations. Therefore, events resulting in TS violations because of Inappropriate Actions and/or Management Deficiencies are considered to be a recurring problem. The corrective actions for these events were not of a generic nature and were considered to be specific for the particular event and would not have prevented this event from occurring.

This incident is Nuclear Plant Reliability Data Systems (NPRDS) reportable.

There were no personnel injuries, radiation overexposures, or uncontrolled releases of radioactivity as a result of this event.

CORRECTIVE ACTIONS:

Immediate: 1) OPS Control Room personnel commenced an orderly shutdown of Unit 1 on January 16, 1992.

Subsequent: 1) The leaking SG tubes were identified in SG 1D by Maintenance personnel.

2) Action plans were developed by the SG Team to evaluate the SG tube leaks.

3) The action plan for tube 47-46 was revised by the SG Team.

4) The bobbin coil data from Unit 1 EOC 7, in 1991, was reevaluated using revised conservative criteria. This conservative criteria was also used to analyze the bobbin coil data acquired on the 1992 Unit 2 EOC 7.

5) Three SG tubes were removed from SG 2C for laboratory analysis.

6) Additional resources were assigned to support the dispositioning process.

Planned: 1) Administrative controls will be developed to address Support Engineerings role and authority in the disposition process.

2) ECT Analysis Management personnel will alter the activities of the resolution data analysts during RFOs, to allow the analysts to focus in on their duties.

3) The ECT guidelines will be revised by ECT Analysis Management personnel to clarify the use of MBM and other discontinuity codes.

4) The ECT guidelines will be revised to delete the S/N limits of 5 to 1 that may lead to a lack of conservatism in the eddy current results.

5) Training of the data analysts will be separated into two groups - primary and secondary analysts, and lead or resolution team analysts.

6) F ; Analysis Management personnel will conduct a review of ECT procedures and will make enhancements as necessary.

7) Administrative controls will be developed to address the manner in which information on SG tubes is conveyed to Support Engineering for tube

disposition.

B) A Human Performance Enhancement System (HPES) evaluation will be submitted by a Human Performance Enhancement Team member to Duke Power Management to address the human factors affecting this event.

SAFETY ANALYSIS:

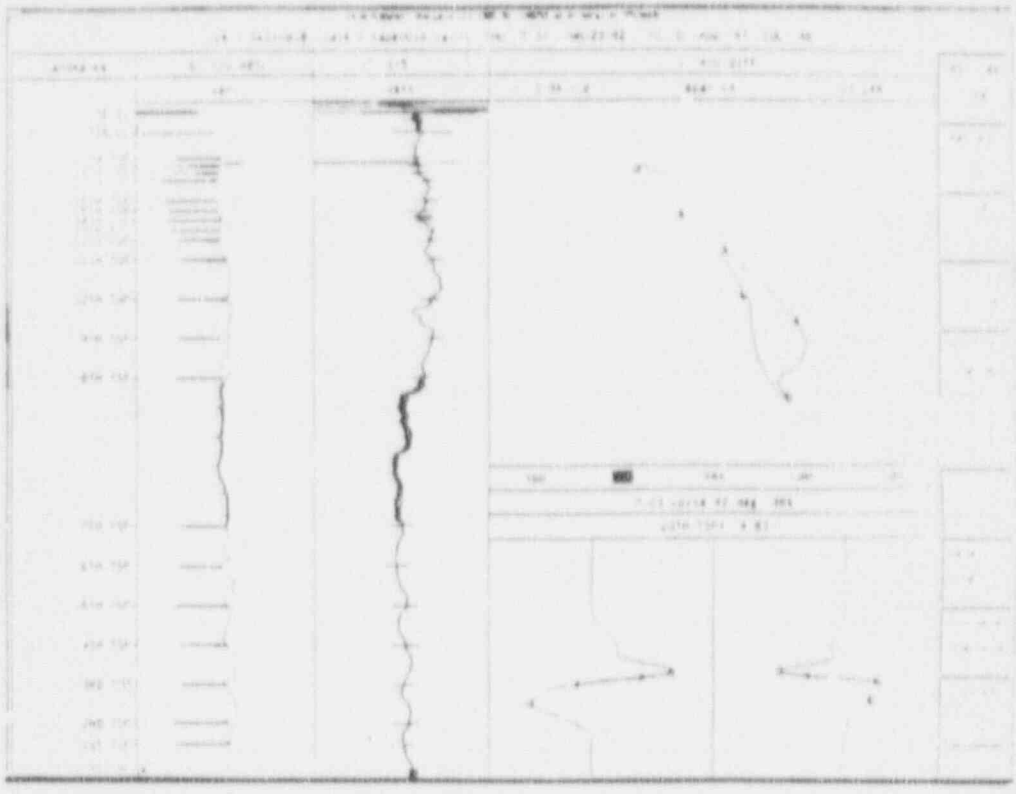
Through prompt investigation, it was learned that tubes 47-46 and 36-30 located in SG 1D, were responsible for the primary to secondary system leakage which shutdown Unit 1. Prior to the unit shutdown, the normal sampling and primary to secondary leak rate calculation program had been accelerated to closely monitor the leakage. As the leakage continued to increase, it was conservatively decided by Station Management to shutdown the unit. Even though the leakage increased to an averaged 235 GPD, it was well below the TS limit of 500 GPD through any one SG.

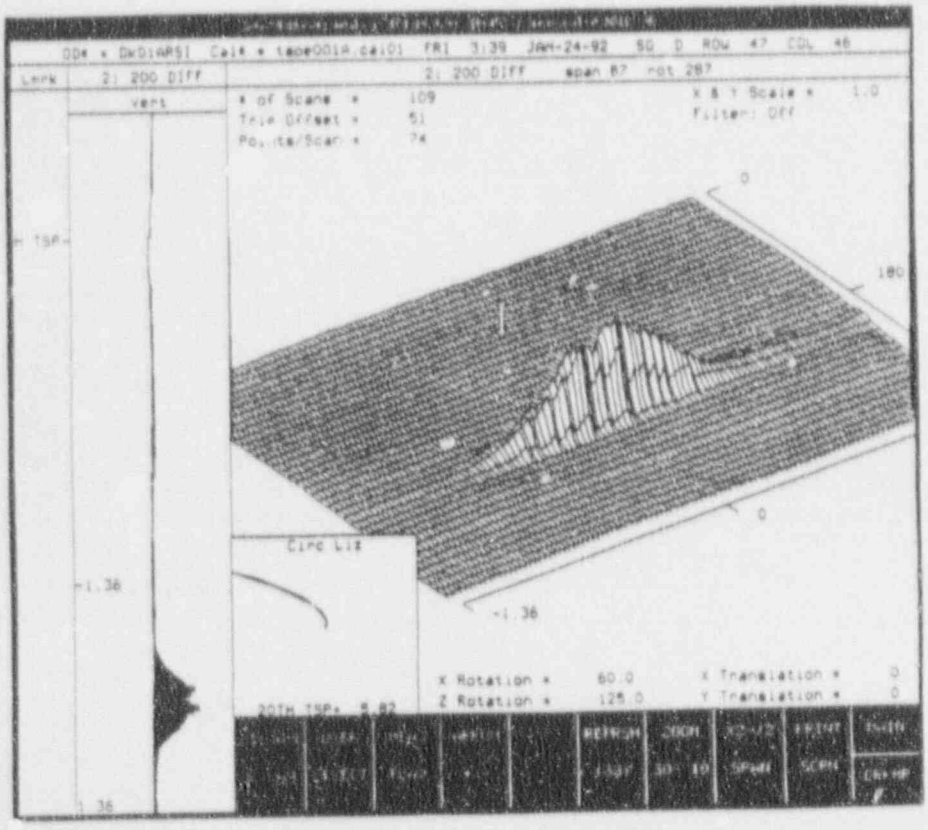
The leak on tube 36-30 was a sleeve to tube joint, while the leak on tube 47-46 was a 1 inch long axial crack. Leakage of this character is bounded by the analysis of "Steam Generator Tube Failure" as described in section 15.6.3 of the Final Safety Analysis Report (FSAR) accident analysis. A SG tube leak is classified as a Condition IV, Limiting Faults event. These events are not expected to occur, but are postulated because their consequences would include the potential for the release of significant amounts of radioactive material. They are the most drastic which must be designed against and represent limiting design cases. The accident analysis assumes a complete severance of a single SG tube. The leaks occurring on tubes 36-30 and 47-46 were of a smaller magnitude with less break flow from primary to secondary. Consequently, there was a slow rise in SG 1D water level and an increased time interval for actuation of EMFs-33 and -34. Hence, more time was available for OPS personnel to take control of the situation.

During the time period of this event, the ability to safely shutdown the plant was not compromised.

The health and safety of the public was not affected by this event.

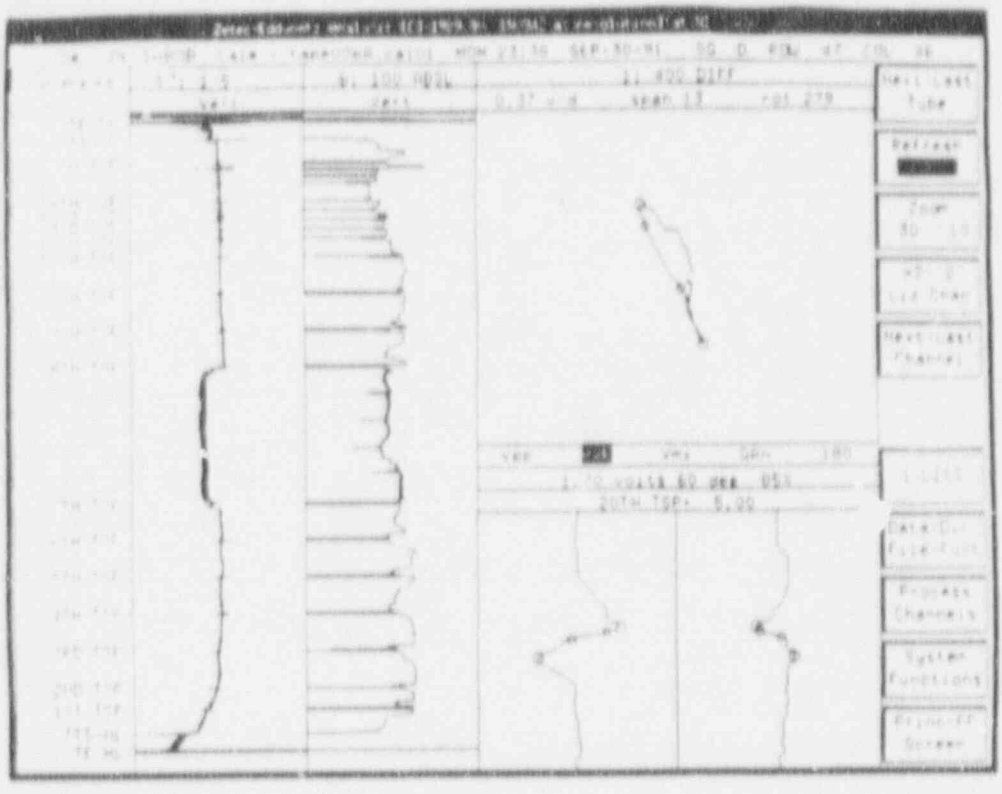
SG TUBE 47-46
BOBBIN COIL DATA
JANUARY, 1992

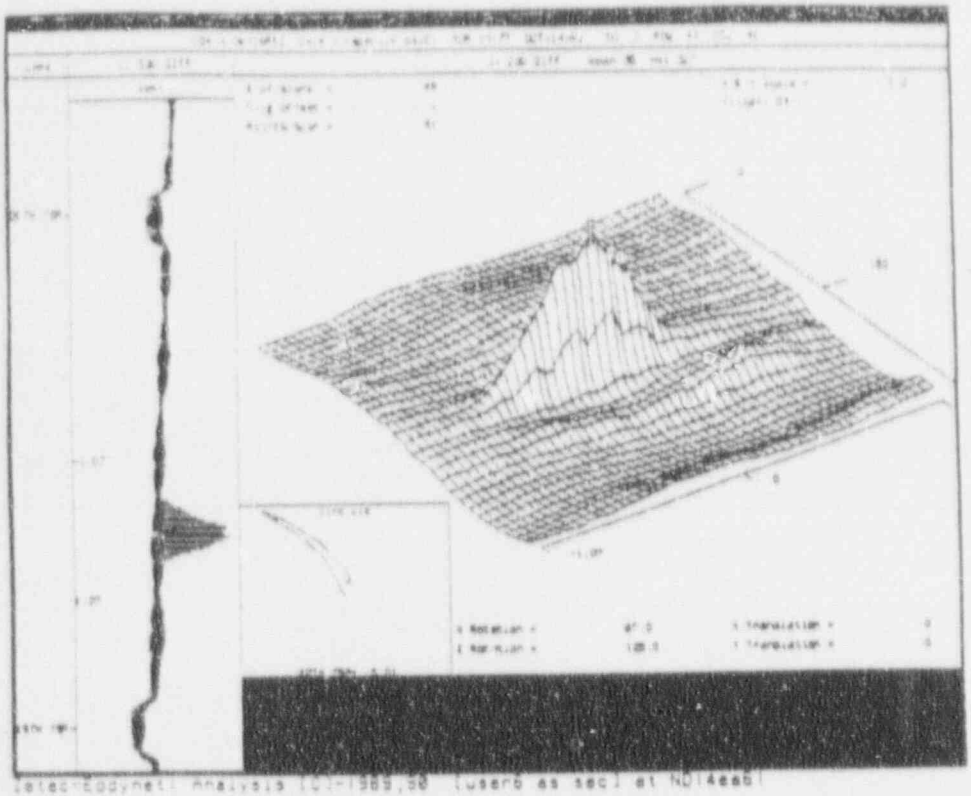




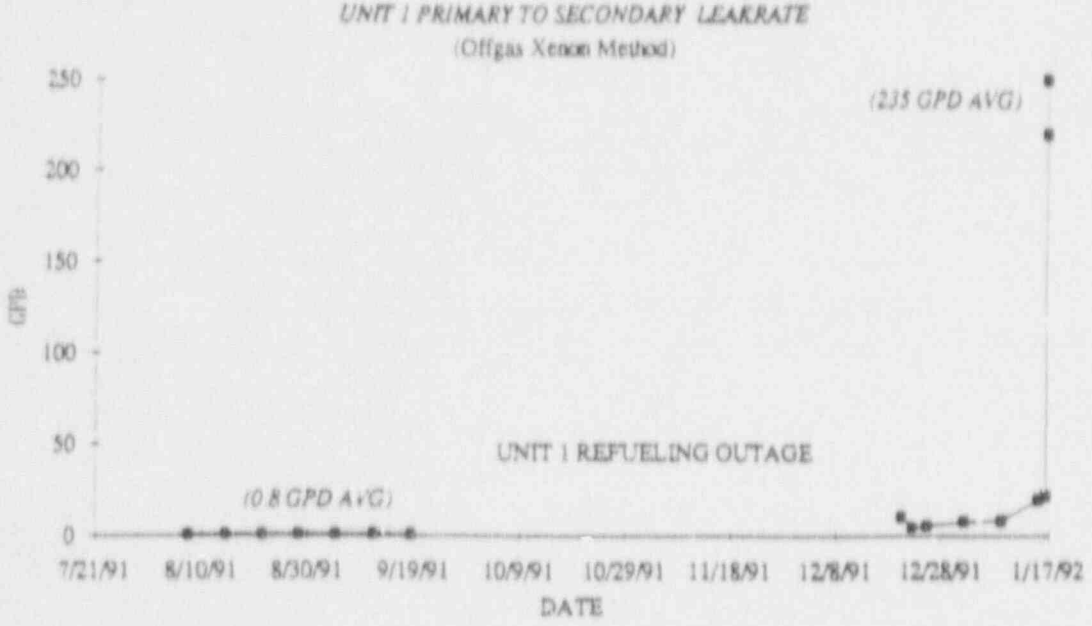
SG TUBE 47-46
MRPC DATA
JANUARY, 1992

SG TUBE 47-46
BOBBIN COIL DATA
SEPTEMBER, 1991





SG TUBE 47-46
MRPC DATA
OCTOBER, 1991



DATE	GPD
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8/14/91	0.8
8/21/91	0.76
8/28/91	0.84
9/4/91	1
9/11/91	1.1
9/18/91	0.8
12/20/91	10.4
12/22/91	4.5
12/25/91	5.6
1/1/92	8.1
1/8/92	8.3
1/15/92	20
1/16/92	22
1/16/92	250
1/16/92	220