FOR
NAME
DATE
ADDRESS
Charlie
Knox
M S
No

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FROM
NAME
EXTENSION
ADDRESS
Charlie
Knox
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ON 4-19-84
I DAVID Albury WENT
To The Seal Table
To Run The Cleaing
cable into one of The
Thimbles I DAVID Albury
was Turing The Crank
when it Brock.

David Albury 4-19-84

TM 450 (03-84) INTEROFFICE MAILING SLIP

C/1

pressure to the crank Handle to get the cable to continue to move. Crank 78 was completed and 79 started with a slight movement of the crank and guide, water started spraying from the side of the guide. David removed His hand from the crank and guide and started leaving the Are The crank and guide Fell From the seal Table The platform, water strated spraying to the ceiling. The Cable started Laying Back on t. Grating at the head of the stairs where I was. Aprox. 50 ft. of was out when I Turned to Exit After Dressing I went to the control Room and Explained what happened

Jerry Clift

85-706

App. C docs

FOR	NAME	DATE
	ADDRESS	☐ Charts ☐ W.S ☐ Read ☐ No

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FROM	NAME	EXTENSION
	ADDRESS	☐ Charts ☐ W.S ☐ Read ☐ No

ON APRIL, 19, 1984 MYSELF, BILL SIMPSON, DAVID ALBURY WENT TO THE SEAL TABLE TO RUN THE [illegible] CABLE INTO ONE OF THE THIMBLES. WE WERE ACCOMPANIED BY CHUCK BAKER SF FOREMAN, JERRY CLIFT SF GENERAL FOREMAN, HAROLD GAMMAGE MECH. ENG., & TWO H.P. TECHS. MR. ALBURY WAS ~~FEEDING~~ CRANKING THE CABLE INTO THE THIMBLE TUBE, MR SIMPSON WAS FEEDING THE CABLE INTO THE CRANK, I WAS BEHIND MR SIMPSON WAITING TO RELIEVE EITHER HIM OR MR ALBURY WHEN THEY TIRED. MR. BAKER AND MR GAMMAGE WERE COUNTING THE TURNS ON THE CRANK AND LETTING MR ALBURY KNOW. THE H.P. TECHS WERE MONITORING THE CABLE AND THE

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AREA. MR ALBURY HAD STOPPED (I THINK) TWICE, TO ADJUST THE TUBE, TO THE CRANK.

WHILE MR ALBURY WAS CRANKING THE HIGH PRESSURE SEAL BROKE LOOSE, AND WE QUICKLY EXITED THE AREA

Dewey W. Rischar

TVA 450 (05-9-80) INTEROFFICE MAILING SLIP

FOR

NAME:

DATE: 4-19-84

ADDRESS:

FROM

NAME: Charles L. Baker

EXTENSION:

ADDRESS:

It was decided that we would ~~run~~ drive the cable + brush in the tube it was already in. David Alberry was turning the crank, + Bill Simpson was maintaining the angle of the tube feeding to the seal table + keeping the cable in line going into the ~~tube~~ tube. Harald Sommage + myself were on either side of Bill watching the operation + counting the turns on the crank. Jerry Clift was above us observing the operation.

FOR NAME DATE

ADDRESS Chatta Knox M S Nor

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FROM NAME EXTENSION

ADDRESS Chatta Knox M S Nor

H. P. tasks were on the flap side of the seal table. David cranked the cable in 50 turns + stopped to weigh the count + inspect the cable, + adjusted the angle of the feeder tube, and ~~com~~ said the the cable seemed to be dragging a little. David turned it in to 69 turns + stopped to inspect the cable again at that time the cable showed several ~~two~~ rough areas ~~on~~ ~~the out~~ the feeder tube + David said that ~~he~~ he didn't know about that area. He then started

TVA 450 (05-9-80) INTEROFFICE MAILING SLIP

FOR NAME DATE

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FROM NAME EXTENSION

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Chatta Knox W S Nor

turning the ~~cable~~ crank again and on the 77 turn the crank started getting harder to turn, & we were nearly ~~on~~ thru through the 78 turn when the tubing broke. David was having to apply some pressure on the crank handle to ~~turn~~ turn it. ~~Then it~~ That's when it broke, & we all got out as fast as possible.

Charles L. Baker

I was one of the last two workers to enter the work area. One of two H.P. personel was setting up for air sample, the other was setting up to monitor for high level radiation, when removing cable from thimble tubes. Engineer Harold Gammage and fitter David Alberg was in the process of shimming the cable drive mechanism. I positioned myself to feed the cable from its can container to the drive mechanism. We proceeded to feed the cable in, on approx, the 50th turn in David stopped, he and chuck agreed on the number of turns in. Then before he started to run the cable on in David suggested that I raise the arch of the cable feed to minimize resistance. On approx, 10 to 15 more turns in we noticed

that the cable had a few small kinks, nothing to stop or bind the cable drive. With in the next few turns the cable feed had more resistance, but nothing that required excessive pressure.

On Approx from 6 o'clock to 9 o'clock position on the drive mechanism was when the break occured. Evacuation and Control room notification was the next step.

William Simpson
4-19-84

20-84
2100 hrs } TIME OF WRITING THIS REPORT

AT 2120 EASTERN TIME I ENTERED ZONE TO LOCATE THIMBLE POSITIONS TO BE CLEANED. FITTERS WD HP FOLLOWED BEHIND WITHIN 10 MINUTES. THE BASE MOUNT, TOP EXTENSION AND HAND CRANK WERE MOUNED ON THIMBLE D-12 THE DUMMY CABLE WAS INSIDE THE THIMBLE APPROXIMATELY 10 TO 12 FEET. [THIS CABLE HAD BEEN RUN INTO THE CORE (ABOUT MIDWAY OF CORE LENGTH) AND WITHDRAWN DURING DAYSHIFT. AS THE END OF THE CABLE APPROACHED THE SEAL TABLE RADIATION READINGS REACHED 40 R CONTACT SO THE CABLE WAS REINSERTED TO REDUCE READINGS.] IT HAD BEEN DECIDED BECAUSE OF THE DOSE RATES THAT THE HOT END OF THE CABLE WOULD BE CUT OFF, TIED OFF, AND LEFT IN ~~THE~~ BELOW THE SEAL TABLE UNTILL A DISPOSAL METHOD COULD BE REACHED. BEFORE CUTTING THE CABLE I DECIDED TO RE INSERT THE CABLE TO CLEAN THE THIMBLE AS MUCH AS POSSIBLE. AT THIS POINT I ROUGHLY CALCULATED THAT WE NEED TO RUN IN AROUND 120 TURNS OF THE [illegible]

WITH 2 HP TECHS, 3 FITTERS, ONE FITTER FOREMAN, AND MYSELF AROUND THE SEAL TABLE AND JERRY CLIFF ON THE PLATFORM ABOVE WE INSERTED THE DUMMY CABLE TO 50 TURNS OF THE CRANK VERIFYING THIS POSITION BEFORE PROCEEDING. WE THEN WENT TO 68 TURNS AT WHICH POINT THE CABLE BECAME TOUGHER TO INSERT. WE HAD PREVIOUSLY NOTED THAT THE CABLE HAD SOME ROUGH SPOTS PRIOR TO 68 TURNS. [NO EXCESSIVE FORCE WAS USED AT THIS POINT] THE BREAK OCCURRED AT THIS POINT @ 21:57. INITIALLY WATER WAS RELIEVING BETWEEN THE TOP EXTENSION BASE AND THE LOWER BASE. WE IMMEDIATELY LEFT THE SEAL TABLE TO THE AIR LOCK. (THE INNER AND OUTER DOORS OF THE AIRLOCK WERE CLOSED) THE INNER DOOR WAS OPENED AND ALL PERSONNEL LEFT. [I WAS WEARING A DIGITAL ALARM DOSERATE METER. JUST PRIOR TO THE BREAK THERE WAS 2 MR READING ON IT. FROM THE TIME OF THE BREAK TO WE ENTERED THE AIRLOCK (APPROXIMATELY 15 SECONDS ELAPSED) THE RATE ALARM HAD GONE OFF AND I HAD A READING OF 25 MR]. WE LEFT THE AIRLOCK AND

illed At The Guard To Notify The Control Room of The Incident. He made several calls without reaching Anyone so I left The Zone and reached Epperson in The Control Room and explained The situation As best As I knew it. ~~At Person~~ I found out from him later The The time of my call was 2200 Eastern T... All personell left The Area and I had The Guard on Duty To lock The Airlock Doors.

As best As I can determine The High Pressure Seal Between Thimble and The High Pressure Line From The Seal Table Top Failed causing The Release.

Harold H Gammage

Harold H Gammage

To: Jim Robinson Date: 4-20-84-0150 AM

Subject: Breaking of High Pressure seal on the seal Table

Time: 2120 signed in on RWP for seal Table work. I went in with Harold Gammage Ahead of the Fitters and marked the Detector Paths we were going to brush

The Fitters came in Aprox. 10 minutes Later consisting of 2 HP Personell, Fitter Foreman Ch... Baker, Steamfitters David Albury, Bill Simp... and Dewey Paschal. Harold and David shimed under The Guide block To insure it was Tight on The seal Table. We were going To run The cable in The Detector Path one or Two more Times To insure it was clean before cutting The end of The cable off and moving To another Detector Path. We established That D... would Turn The crank, Chuck Baker would count Revolutions of The crank Handle, Bill Simpson would Hold The overhead Guide Tube and keep The cable straight, Dewey Paschal would watch The cable in the bucket for bad Places. David made one Revolution with The crank Harold wanted To varify The length of cable Per crank. Harold measured The 2nd crank Then Again The 3ed crank. Each crank was Aprox 10". AT This Time Harold told David and Chuck How many Revolutions David was To Turn The crank. David started, He stopped at 50 Turns to varify The count, David started Again and stopped AT 69 cranks Looked AT The cable and said he did not know whether or not it would go. On The 75th crank The cable

(27)

8405172002 8

L05 840517 800

MAY 17 1984

R. A. Sessoms
1760 CST2-C

Subject: SEQUOYAH NUCLEAR PLANT - UNIT 1 - INCORE THIMBLE EJECTION - INVESTIGATION AND REVIEW OF EVENTS FOR INDUSTRIAL SAFETY IMPLICATIONS

Reference: Your memorandum to me dated May 2, 1984 (L01 840502 803)

As you requested in the referenced memorandum, an investigation committee has conducted an industrial safety evaluation of the subject incident. A report of their findings is attached.

L. C. Ellis
Chariman, Investigation Committee

LCE:BLF
Attachment
cc (Attachment):
NUC PR ARMS, 1520 CST2-C
H. N. Culver, 249A HBB-K
James P. Darling, 1750 CST2-C
Arthur E. Ives, 1350 CUBB-C
C. C. Mason, NUC PR, Sequoyah
Jim Robinson, NUC PR, Sequoyah
G. F. Stone, 215 MPB-M

U00171 4101

C/2

INCORE THIMBLE EJECTION - SEQUOYAH NUCLEAR PLANT, UNIT 1

An investigation committee composed of Lonnie C. Ellis, Jim Robinson, and Arthur E. Ives completed an industrial safety evaluation of the subject incident. The evaluation involved an inspection of the seal table area; review of procedures, sketches, and drawings; discussions with Westinghouse; and interviews with the majority of employees involved. Those interviewed were J. Clift, General Foreman; H. Gammage, Engineer; D. Albury, Steamfitter; and S. Harrison and M. Edwards, Health Physics Technicians.

We initially evaluated the incident based on its potential to have resulted in a fatality, hospitalization of five or more of the involved employees, and property damage of greater than $100,000. Although we would not want to downplay the seriousness of this incident and the stress of the moment, there was in this case adequate prior warning of bubbling and low-volume flow of relatively cool water to allow egress from the most remote point prior to total seal failure and subsequent thimble tube ejection. There were three paths of egress, two of which were remote from each other, and the individuals involved were knowledgeable of them. The air lock was the most desirable and the one used.

The air lock had been out of service for periods of time during the day. Welding under workplan 9606R2 was being done inside the air lock. This necessitated opening the outside door, thereby making the inner door inoperative. Had the incident occurred during this work, egress through the air lock would have been delayed or primary egress would have been through the submarine hatch.

The incident in total will exceed $100,000 in property damage, cleanup, and restoration. The majority of costs result from the radiological aspects of the incident. The Designated Agency Safety and Health Official and the Office manager were notified of the incident.

We do not believe this investigation was significantly hindered due to the restoration of the area prior to our involvement. Only a visual observation of the ejected tube was not available to us and that was viewed on blown-up photos.

Sequence of Events

Initial cleaning of thimble tubes was begun on March 28, 1984, and was reported complete on April 5, 1984. The unit was in Mode 5. The thimble drive units were reinstalled and the incore probes were inserted to verify adequate cleaning. Several of the cleaned tubes failed to pass the thimble and others previously identified as clear were now identified as plugged.

Sequence of Events (continued)

Subsequently, a maintenance request (attachment 1) was written on April 18, 1984, to dry brush the blocked thimble on the incore monitor tubes. It was assigned to Field Services and was proceeding when the second shift reported on April 19, 1984. Applicable sections of SMI-0-94-1 (attachment 2) were identified under work instructions for reference.

D-12, the tube that failed, was not included in the maintenance request as a tube to be cleaned but was being used to measure the length of the cleaning cable.

A crew of six was assigned to brush the tubes. They were H. Gammage, Engineer; D. Pascal, B. Simpson, and D. Albury, Steamfitters; and S. Harrison and M. Edwards, Health Physics Technicians. The General Foreman, J. Clift, and the Steamfitter Foreman, C. Baker, were also on the seal table platform observing the work and assisting as necessary. Seven of the eight employees were arrayed on the seal table platform operating the brushing mechanism, while the eighth, Mr. Clift, was on the platform above.

The reactor was in Mode 1 (approximately 30 percent power) which places the pressure at 2250 psi and the temperature at 547°F.

The specially designed brushing mechanism is composed of several feet of heliflex cable fed through a stabilizing tube and forced through the thimble tube by a hand crank. Attachment 3 shows a cut-away detail of the thimble tube connection. The hand crank is attached to the thimble tube at point 1, with the brush entering the connection at that point.

The brush had entered at approximately one-half of the tube's 120-foot length and was meeting some slight increased resistance. Various levels of sound were heard by the involved employees and water began flowing from the connection. The tube was not observed being ejected, nor was steam observed at this time. The employees immediately left the platform, opened and entered the air lock, and exited the area. Looking back through the air lock portholes they could see steam begin to build in the room. Exit time from platform to safety in the air lock was no greater than 20 seconds. Under the circumstances, the exit appeared very orderly and there were no injuries.

The failure occurred at the reactor pressure boundary seal, point #2 (attachment 3). This seal is obtained by a 5/16-inch swagelok nut and ferrules crimped onto a smaller stainless steel heavy wall tube expanded to 5/16 inch. This union is protected from external tampering by a plastic boot (point 3).

Conclusions

The reason for the failure is not evident. Existing possibilities are (1) the tube was not expanded sufficiently or to a sufficient depth (specifications require a minimum of 1.5 inches), (2) the swagelok was not tightened sufficiently (hand tight and 1.25 additional turns) to set the ferrule, (3) the nut had inadvertently been loosened since the union was made, allowing the ferrule to relax, or (4) the partial crack in the ferrule allowed the tube to be released. The flexing activity of the brushing would have aggrevated any of the above conditions leading to the failure. Following this failure all fittings were checked and some were tightened. SMI-O-94-1 states that this procedure is not to be used at power. Since the unit was in Mode 1, this procedure was violated.

Recommendations

1. All cleaning and brushing of these tubes should be done with the reactor at Mode 5.

2. If for some reason the brushing iteration is required past Mode 5, a thorough prejob safety analysis should be performed and the procedure approved by PORC. As a minimum, a mechanism should be installed to preclude tube ejection and leakage and a clear path of egress should be established.

3. A rigidly mounted attachment should be fabricated on which the brushing mechanism and crank would mount which will eliminate any stress or flex on the thimble tube connection. An alternative method of cleaning which would mount independently of the thimble tube would be preferred.

4. All work on any system where there is no secondary pressure boundar should be evaluated on a case-by-case basis and adequate means to mitigate an inadvertent pressure failure should be applied.

5. Ensure the constant availability of the primary egress route, ie, the air lock. Consideration should be given to leaving the inner door open (with the shift engineer's permission) or providing a person to man the door.

6. Ensure that all emergency notification systems are in constant operation. The air lock telephone was out of service during this event.

7. Reinstall the plastic boots or install other means around all reactor pressure boundary seal unions to prevent tampering.

8. Commend the eight employees for their coolness under pressure and their ability to reason through egress options under the stressful situation.

LCE:BLF
5/14/84

ATTACHMENT 1

UNIT	FUNCTION SYSTEM	SYSTEM COMPONENT	ADDR
1	MST	94	

Traveling Incore Monitor

EQUIPMENT LOCATION

El 693 Seal Table

ASSIGNED TO

MECH ☐ ELEC ☐ INST ☐

DESCRIBE WORK REQUESTED: Dry brush blocked thimbles listed below : See Attached

** Use No Water or Neclube **

ORIGINATOR: D.P. Roberts SECTION: Eng. (R) SUPV. INITIAL: WH

PRIORITY: EMERGENCY ☐ IMMEDIATE ATTENTION ☒ ROUTINE ☐

EQUIPMENT CATEGORY: CSSC ☒ OTHER ☐

WORK INSTRUCTION: Dry Brush only Following applicable SECTIONS OF SMI-0-94-1.

QA OR POST MAINT. TEST REQUIREMENTS: Per SMI-0-94-1

INVOLVES REPLACEMENT OF EQUIPMENT QUALIFIED AS IEEE ... NO ☐ IF YES ATTACH TVA FORM 6436D

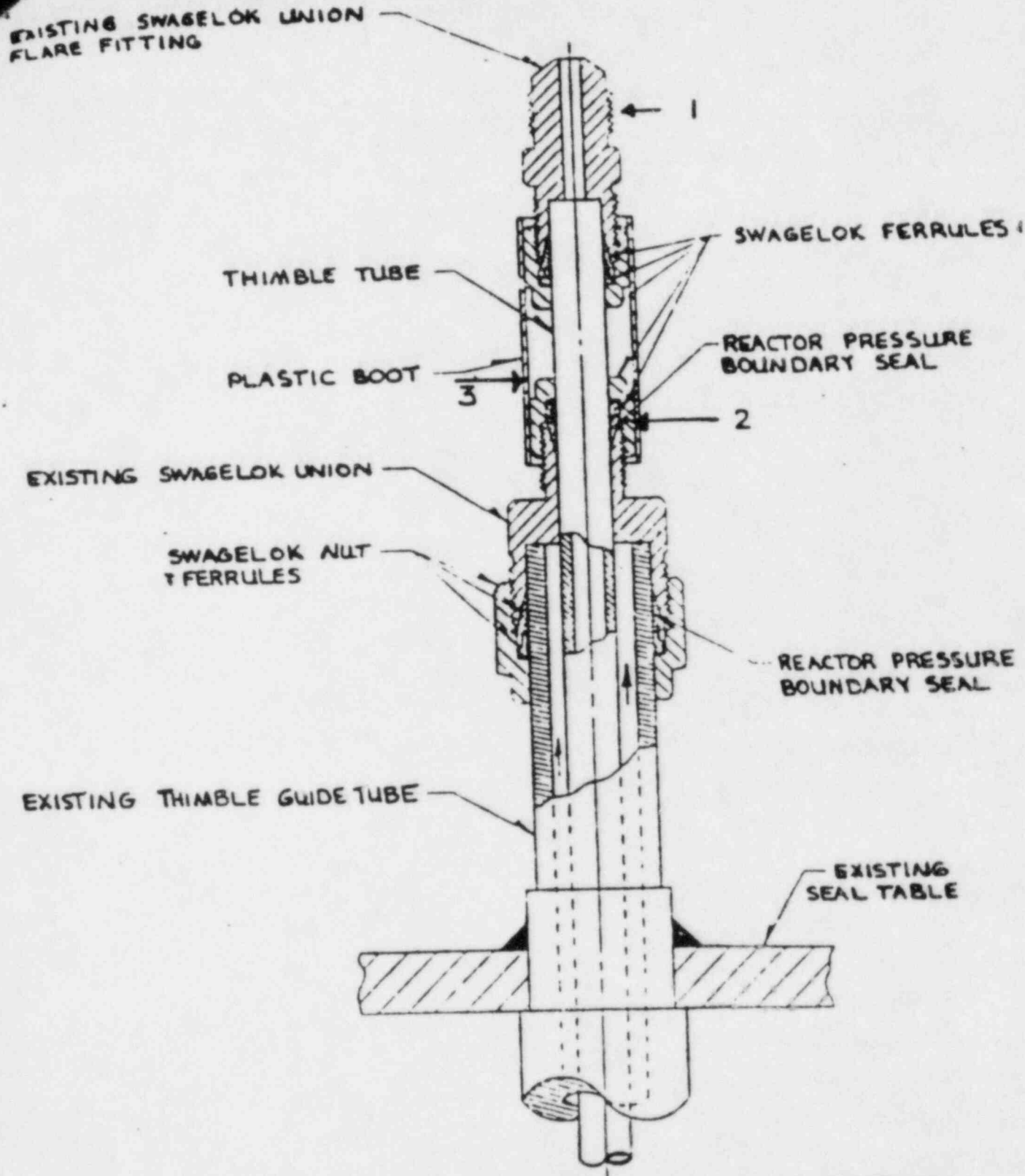
QA REVIEW (CSSC ONLY) ✓ QA SIGNATURE: Richard L. Matter DATE: 4-18-84

8 4 0 5 1 7 1 0 0 0

Detector	Path	Core location
A-1		H-15
A-2		K-2
A-4		P-4
A-8		E-9
A-10		L-5
B-9		H-13
C-1		G-9
C-2		R-8
C-3		C-5
C-4		B-13
C-5		H-11
C-6		J-14
C-7		J-1
C-8		L-8
C-9		F-3
C-10		E-5
D-6		D-14
D-8		D-3
E-8		F-8
E-9		C-8
F-3		B-3
F-5		N-4

U0U771 4106

ATTACHMENT 3



EXISTING THIMBLE TUBE CONNECTION

nuclear · awareness · network
1347½ massachusetts • lawrence, kansas 66044 • (913) 749-1640

October 15, 1985

Director
Office of Administration
US Nuclear Regulatory Commission
Washington, D.C. 20555

FREEDOM OF INFORMATION ACT REQUEST
FOIA-85-706
Rec'd 10-21-85

FREEDOM OF INFORMATION ACT REQUEST

To Whom It May concern:

Pursuant to the Freedom of Information Act, U.S.C. 522, as amended, the Nuclear Awareness Network requests the following documents regarding the Wolf Creek Nuclear Generating Plant. Please consider "documents" to include reports, studies, test results, correspondence, memoranda, meeting notes, meeting minutes, working papers, graphs, charts, diagrams, notes and summaries of conversations and interviews, computer records, and any other forms of written communication, including internal NRC staff memorands. The documents are specifically requested from, but not limited to, the following offices of the NRC: Office of Analysis and Evaluation of Operational Data (AEOD); Office of Nuclear Reactor Research (NRR); Office of Nuclear Regulatory Research (Research); Office of Inspection and Enforcement (I&E); Office of Investigations (OI); Generic Issues Branch of the Division of Safety Technology, and the Operating Reactors Branches of the Division of Licensing.

In your response, please identify which documents correspond to which requests below.

Pursuant to this request, please provide all documents prepared or utilized by, in the possession of, or routed through the NRC related to the Wolf Creek Nuclear Generating Plant:

1.) Any and all information relating to the "Sequoyah Incident" which would have occurred prior to August 20, 1985--probably during 1984. This incident occurred during a maintainence procedure which involved Chuck Mason and 3 other workers who may have been put in jeopardy. It was purported to have been investigated by the Nuclear Safety Review Staff (NSRS) which is a part of TVA, and reports were made to a Mr. Willis at TVA. Included in this request are any and all documents submitted by TVA, NSRS, and/or Mr. Willis on this subject.

2.) Any and all information surrounding an incident on or about August 4, 1985 involving a release, or potential release, of radiation at Wolf Creek into the cooling lake and/or atmosphere.

~~8511210196~~

If any of the material covered by this request has been destroyed and/or removed, please provide all surrounding documentation, including but not limited to a description of the action(s) taken, relevant date(s), and justification(s) for the actions.

For any documents or portions that you deny due to a specific FOIA exemption, please provide an index itemizing and describing the documents or portions of documents withheld. The index should provide a detailed justification of your grounds for claiming each exemption, explaining why each exemption is relevant to the document or portion of the document withheld. This index is required under Vaughn v. Rosen (I), 484 F.2d 820 (D.C. Cir. 1973), cert. denied, 415 U.S. 977 (1974).

We look forward to your response to this request within ten days.

Sincerely,

Stevi Stephens

Stevi Stephens