

CONDITION REPORT
ED 8342-1

NO. 2000-0782 PAGE 1 OF 4

EVENT DATE	EVENT TIME	DISCOVERY DATE	DISCOVERY TIME	REFERENCE DOCUMENTS/ASSET NUMBER
		4/6/00	0330	

CONDITION DESCRIPTION

Inspection of the Reactor flange indicated Boric Acid leakage from the weep holes (see attached pictures and inspection record). The leakage is red/brown in color. The leakage is worst on the east side weep holes. The worst leakage from one of the weep holes is approx 1.5 inches thick on the side of the head and pooled on top of the flange. The leakage evident from the weep holes appears to be a dried stream in every case. The leakage on the flange are small flakes of Boric Acid that has spalled off from the top of the flow streams and from some of the clumps within the weep holes. The total estimated quantity of leakage through the weep holes and resting on the flange is approx. 15 gallons. All leakage appears to be dry. A very small quantity (approx. 0.25 pint) and run down the side of the flange and onto the floor. Preliminary inspection of the head through the weep holes indicates clumps of Boric Acid are present on the east and south sides. The north and west sides have very little Boric Acid accumulation from the weep holes. The flange studs/nuts do not appear to be affected.

CONTINUED

NAME (Print)	SIGNATURE	DATE	ORGANIZATION	TELEPHONE NO.	MAIL LOCATION
Peter J. Mainhardt	<i>Peter J. Mainhardt</i>	4/6/00	SYME	8272	1056

SUPERVISOR

PLANT OPERATIONS REVIEW YES NO

COMMENTS

RECOMMENDED CATEGORY CONTINUED

NAME (Print)	SIGNATURE	DATE	ORGANIZATION	TELEPHONE NO.	MAIL LOCATION
WLOEGER	<i>W. Loeger</i>	4/6/00	OPS	7501	2103

REPORTABILITY 1 HR 4 HR 24 HR N/A

OPERABILITY YES NO N/A

IMMEDIATE ACTIONS TAKEN OR NEEDED / COMMENTS

NOTIFIED BACC COORDINATOR PER STEP 6.3.5 OF N6-EN-00334, BA CORROSION CONTROL.

FURTHER EVALUATION REQUIRED AFTER DETAILED INSPECTION DETAILED IN STEP 6.4.1 OF N6-EN-00334 IS PERFORMED

POSSIBLE MODE 4 RESTRAINT

CONTINUED

NAME (Print)	SIGNATURE	DATE	TIME
WLOEGER	<i>W. Loeger</i>	4/6/00	0530

cc: Initiator
CR Files
Nuclear Records Management

QIP

CONDITION REPORT

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NO. 2000-0782

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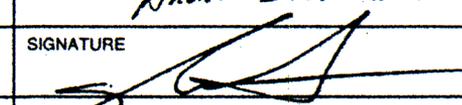
OWNER SYME		CATEGORY ROUTINE		DUE DATE 6/5/00		OPERATING EXPERIENCE REPORT <input checked="" type="checkbox"/> EVALUATE <input type="checkbox"/> INITIATE	
<input type="checkbox"/> CATPH	CAUSE DETERMINATION <input checked="" type="checkbox"/> APPARENT <input type="checkbox"/> ROOT CAUSE <input type="checkbox"/> MULTI-DISC. ROOT CAUSE				<input type="checkbox"/> ERB		
<input type="checkbox"/> EXPERIENCE REVIEW	<input type="checkbox"/> EXTENT OF CONDITION	<input type="checkbox"/> POTENTIAL MRFF	<input type="checkbox"/> OTHER REVIEW REQUIRED				

MRC COMMENTS

MODE 4 RESTRAINT

Evaluate if an Operating Experience (OE) Report is appropriate and provide a justification/response either way. Please reference NG-NA-00305, Step 6.7, Operating Experience Assessment Program and the Operating Experience Reference Guide. Contact Dennis Snyder if you need assistance.

RmN

SUPERVISOR ASSIGNED DUE DATE:		<input checked="" type="checkbox"/> CONTINUED	
10 CFR PART 21? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES	IF YES, DATE	SYSTEM CAPABLE OF PERFORMING SPECIFIED FUNCTION? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> N/A	
ANI REVIEW REQUIRED? <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES IF YES, ANI SIGNATURE REQUIRED	SIGNATURE		DATE
PREPARER (Print) <i>ANDREW SIEMASZKO</i>	SIGNATURE <i>Andrew Siemaszko</i>		DATE <i>4/19/2000</i>
SUPERVISOR APPROVAL (Print) <i>Glenn McIntyre</i>	SIGNATURE 		DATE <i>4-27-00</i>
MANAGER APPROVAL (Print) <input type="checkbox"/> N/A	SIGNATURE		DATE
DIRECTOR APPROVAL (Print) <input type="checkbox"/> N/A	SIGNATURE		DATE
VICE PRESIDENT APPROVAL (Print) <input type="checkbox"/> N/A	SIGNATURE		DATE
SRB APPROVAL (Print) <input type="checkbox"/> OE REQUIRED <input type="checkbox"/> N/A	SIGNATURE		DATE
ERB APPROVAL (Print) <input type="checkbox"/> N/A	SIGNATURE		DATE

CONDITION REPORT

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NO 2000-0782

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Response to CR 2000-0782

Action Item 1 of this CR is issued to "Evaluate if an Operating Experience (OE) Report is appropriate and provide a justification/response either way. Reference NG-NA-00305, Step 6.7, Operating Experience Assessment Program and the Operating Experience Guide.

Event description

Initial Reactor Vessel Head inspection conducted on 4/5/2000 revealed an accumulation of boron on the Southeast Reactor head flange between the head and the studs. Boron deposits were "lava like" and originating from the "mouse holes" and CRD flanges.

Framatome completed the CRD Video Inspection at 1400 on 4/6/2000. Ed Chimahusky and Andrew Siemaszko were present during the inspection. The inspection is documented on the VHS video cartridge. James R. Harris from Framatome Technologies, Ed Chimahusky, and Andrew Siemaszko examined the results of the inspection.

Five leaking Control Rod Drives were identified at locations: F10, D10, C11, F8, and G9. Main source of leakage can be associated with F10 drive. Positive evidence exists that drives F8, D10 and C11 have limited gasket leakage. This condition can propagate at any time and therefore these drives are considered as leaking. There are no boron deposits on the vertical faces of the flange of G9 drive. The bottom of the flange of G9 drive is inaccessible for inspection due to the boron buildup on the reactor head insulation, not allowing full camera insertion. Since the boron is evident only under the flange and not on the vertical surfaces, there is a high probability that G9 is a leaking CRD.

Based on the available information, System Engineering recommends replacement of gaskets or repairs for Control Rod Drives located at F10, D10, C11, F8, and G9 as necessary.

In addition should the examination of flanges (for the above listed drives) indicate steam cuts, System Engineering recommends machining of the flange faces as necessary to ensure acceptable Control Rod Drives performance.

Flange D10 should be machined by PTI. gm

The proposed sequence of repair is to start with F10 CRD as the prime suspect of the leak, then follow with D-10 as the CRD identified during 11RFO as a suspect of leakage. The remaining Control Rod Drives C11, F8, and G9 can be worked in order convenient to Framatome Technologies. These three leaks identified were significantly smaller in comparison with the leaks observed on F10, and D10 CRDs Control Rod Drives. System Engineering recommends the sequence to be C11, F8, and G9.

Sequence of CRD work is ---F10---D10---C11---F8---G9---

This sequence is provided for efficiency of work and is not a requirement.

OATS Followup Item 1 written to complete replacement of gaskets and machining of Flange D10.

 Continued

Operability determination.

Review of industry experiences indicates that this type of CRD leakage has been identified numerous times in the nuclear industry. Since the leakage is unwanted, most typical approach to resolve the problem is to replace gaskets and machine flange faces as required. In some occasions the leak is monitored and not repaired at the time of discovery. Based on the quantity of the leak found at Davis Besse on 4/5/200 during 12RFO and Control Rod Drives performance during operating cycle 12 all Control Rod Drive mechanisms are operable. No reasonable assurance exists that the leak will not propagate. The estimated leak rate from the flanges is inconsequential for the RCS inventory. Total unidentified RCS leakage was maintained at approximately 0.3 GPM during most of the operating cycle. 12. This is well below the Technical Specifications limit of 1 GPM. Numerous small RCS valves packing leaks were identified during the recent Reactor Building Mode 3 walkdown on 4/1/2000. Control Rod Drives flange leakage was a small contributor to the overall unidentified leak rate of 0.3 GPM.

Operating Experience

Operating Experience Assessment Program procedure NG-NA-00305 was reviewed to identify the need of issuing the OED. Step 6.7 directs Davis Besse personnel to submit the OED to the Operating Experience Coordinator for dissemination upon discovery of an event or a condition that would be of use to the industry.

Flange leaks originating from the Control Rod Drive (CRD) flanges have been identified around 1980. Various attempts were made by Framatome Technologies, ABB, and others to reduce CRD leakage. Initially used asbestos gaskets were replaced with the flexitalic type gaskets. Davis Besse's CRD flexitalic gaskets were replaced with the graphite gaskets in approximately 1992. The size and type of the leak seen at Davis Besse is not unusual. Ron Pillow from Framatome Technologies discussed this issue with Andrew Siemaszko. Ron agreed that no new conditions could be presented to the industry at this time and supported System Engineering position not to issue Operating Experience to the industry. Should the results of CRD leakage investigation revile any new conditions an evaluation will be performed and the Operating Experience will be issued as required.

Continued

BORIC ACID CORROSION CONTROL INSPECTION CHECKLIST

(For documentation purposes only - refer to NG-EN-00324 for procedural requirements)

INITIAL INSPECTION

COMPONENT REACTOR
LOCATION HEAD FLANGE
DATE 4/6/00 **MDT/WO#/CR** _____

Amount, thickness, density of boron / Area of component affected:

BA Deposit	Minor	Moderate	Substantial	Dry / Active	Color
Packing				Dry / Active	
Packing gland				Dry / Active	
Yoke arms				Dry / Active	
Bonnet Studs				Dry / Active	
Bonnet Nuts				Dry / Active	
Bonnet				Dry / Active	
Body				Dry / Active	
Piping				Dry / Active	
<u>Other</u>				<u>Dry</u> Active	<u>Red/Brown</u>

Reason for classification: Heavy Leakage from head weepholes

Identify all other components affected: N/A or list Head, Flange

Component internals affected or area not visible: N/A or list Head, CRD Tubes

Is leakage active? YES NO
 Estimate of leak rate: _____

Recommended method to stop leakage: REWORK

Corrosion present? YES NO
 Evidenced by: Red/Brown Deposits

Material Evaluation for affected components/Method of Determination:

Packing Gland	S/S or other	_____	
Yoke Arms	S/S or other	_____	CR 2000-0782
Bonnet Studs	S/S or other	_____	ATTACHMENT 1
Bonnet Nuts	S/S or other	_____	PAGE 1 OF 5
Bonnet	S/S or other	_____	
Body	S/S or other	_____	
Piping	S/S or other	_____	
Other	<u>S/S or other</u>	<u>Stainless Steel, Carbon Steel.</u>	

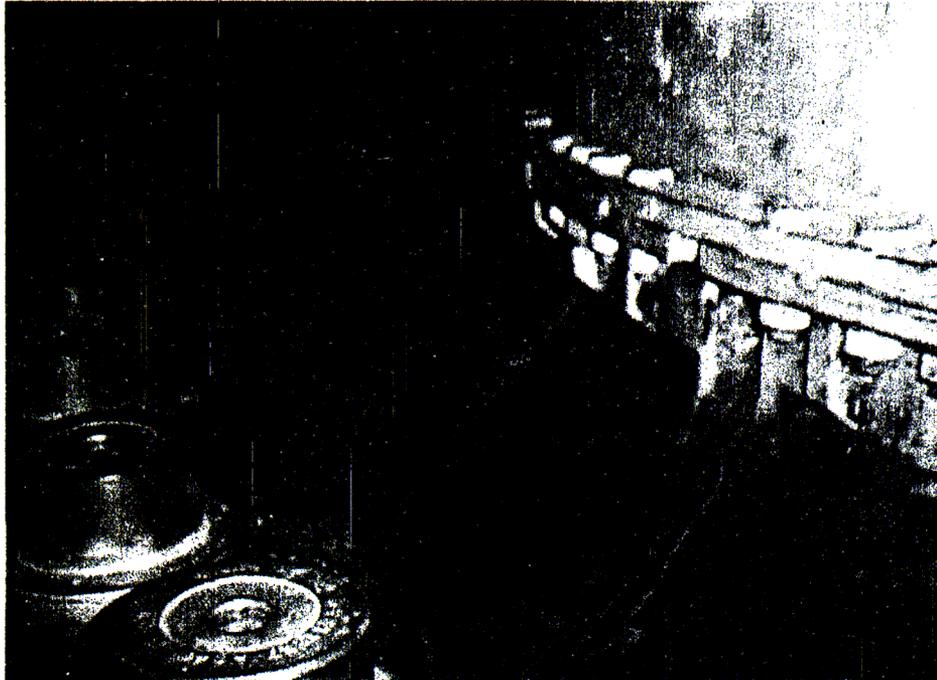
Detailed Inspection Recommended? YES NO
 Evaluation can be considered complete if the leakage is deemed Minor, if leakage is on component that is stainless steel or high alloy, or if leakage/corrosion is limited to components that do not affect function.

Basis for recommendation: New Leakage from head which was not evident during IIRFO

RP contacted for clean up? YES NO

COMPLETED BY Patty Mitchell DATE 4/6/00

Reactor Vessel Head Boric Acid Leakage
4.6.00

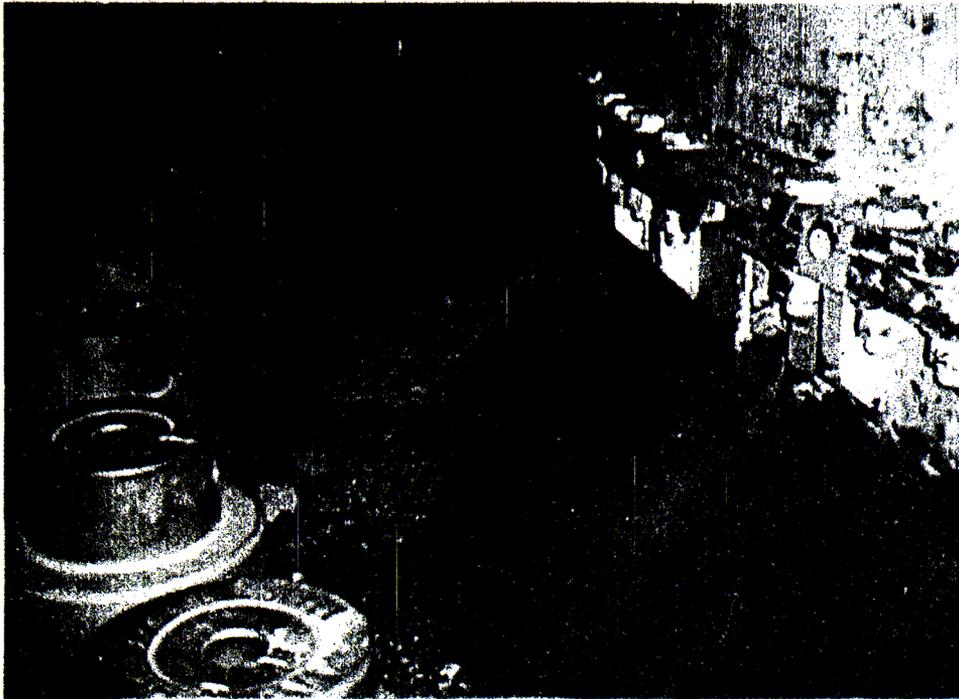


On north side facing east



On north side facing south east

CR 2000-0782
ATTACHMENT 1
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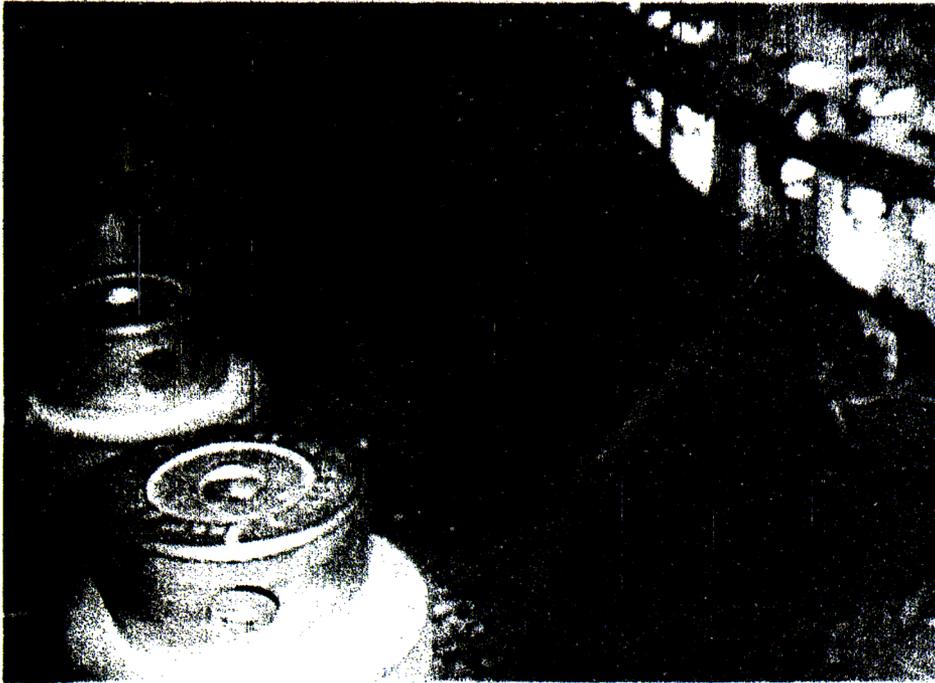


On east side facing south

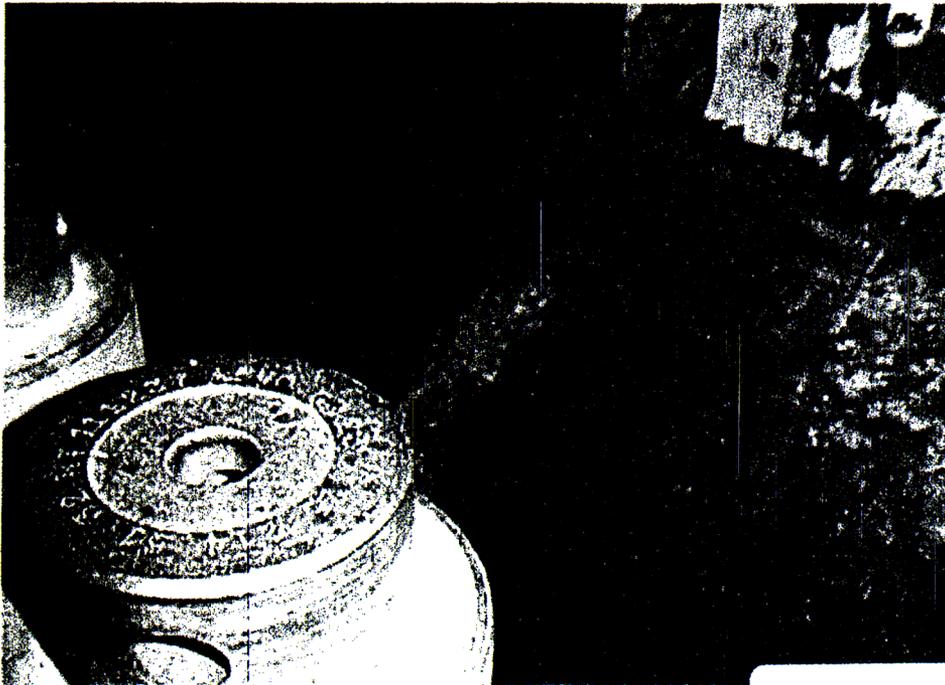


On east side facing south

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ATTACHMENT 1
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On south side facing west



On south side facing west

CR 2000-0782
ATTACHMENT 1
PAGE 4 OF 5



On south side facing north

CR 2000-0782
ATTACHMENT 2
PAGE 5 OF 5

Peter J. Mainhardt

03/15/02 04:08 PM

To: Charles E. Ackerman/TE/FirstEnergy@FirstEnergy
cc: Dale L. Miller/TE/FirstEnergy@FirstEnergy
Subject: CR 2000-0782



Chuck,

Attached are the original digital photos that I took of the head during 12RFO just after the insulation was removed and before decon. These are the original images to the hard copy in Andrews performance book.

----- Forwarded by Peter J. Mainhardt/TE/FirstEnergy on 03/15/2002 03:59 PM -----



Prasoon K. Goyal

08/29/2000 09:52 AM

To: Peter J. Mainhardt/TE/FirstEnergy@FirstEnergy
cc:
Subject: CR 2000-0782

FYI

----- Forwarded by Prasoon K. Goyal/TE/FirstEnergy on 08/29/2000 09:49 AM -----



Andrew J. Siemaszko
04/12/2000 08:46 AM

To: Prasoon K. Goyal/TE/FirstEnergy@FirstEnergy
cc:
Subject: CR 2000-0782



See attached pictures. Reactor Vessel Head Boric Acid Leakage 12RFO April 20
Andrew

Reactor Vessel Head Boric Acid Leakage
4.6.00



On north side facing east



On north side facing south east



On east side facing south



On east side facing south



On south side facing west



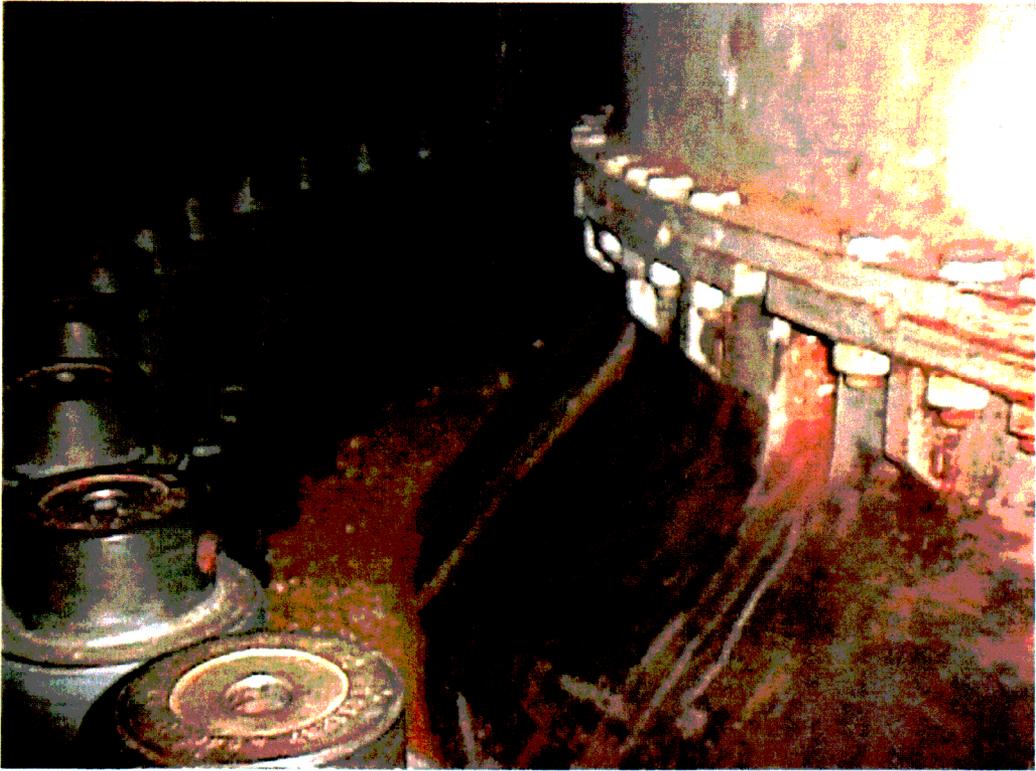
On south side facing west



On south side facing north

Reactor Vessel Head Boric Acid Leakage
4.6.00

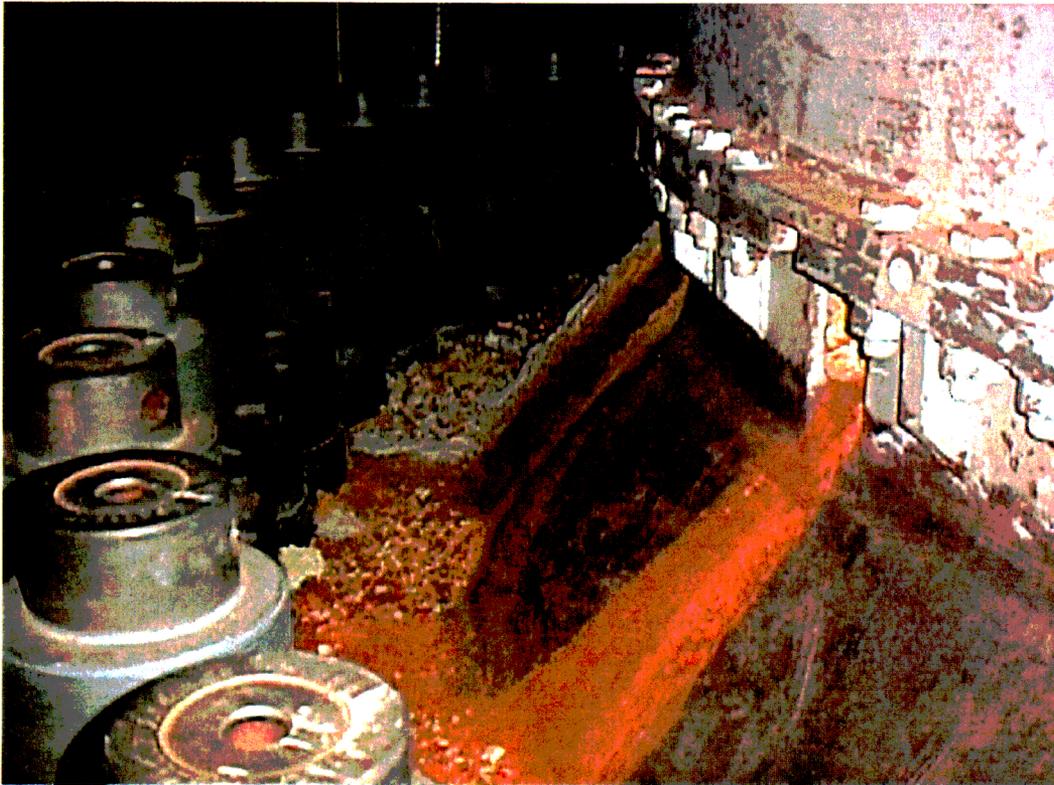
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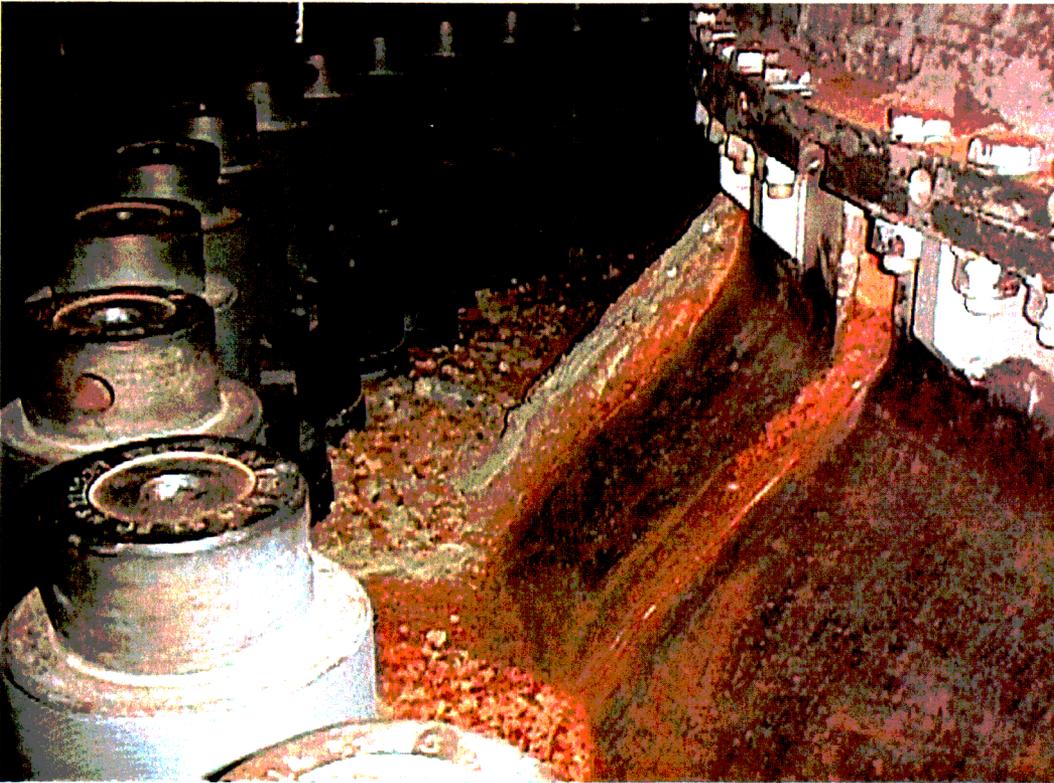
On north side facing east



On north side facing south east



On east side facing south



On east side facing south



On south side facing west



On south side facing west



On south side facing north

Reactor Vessel Head Boric Acid Leakage
4.6.00

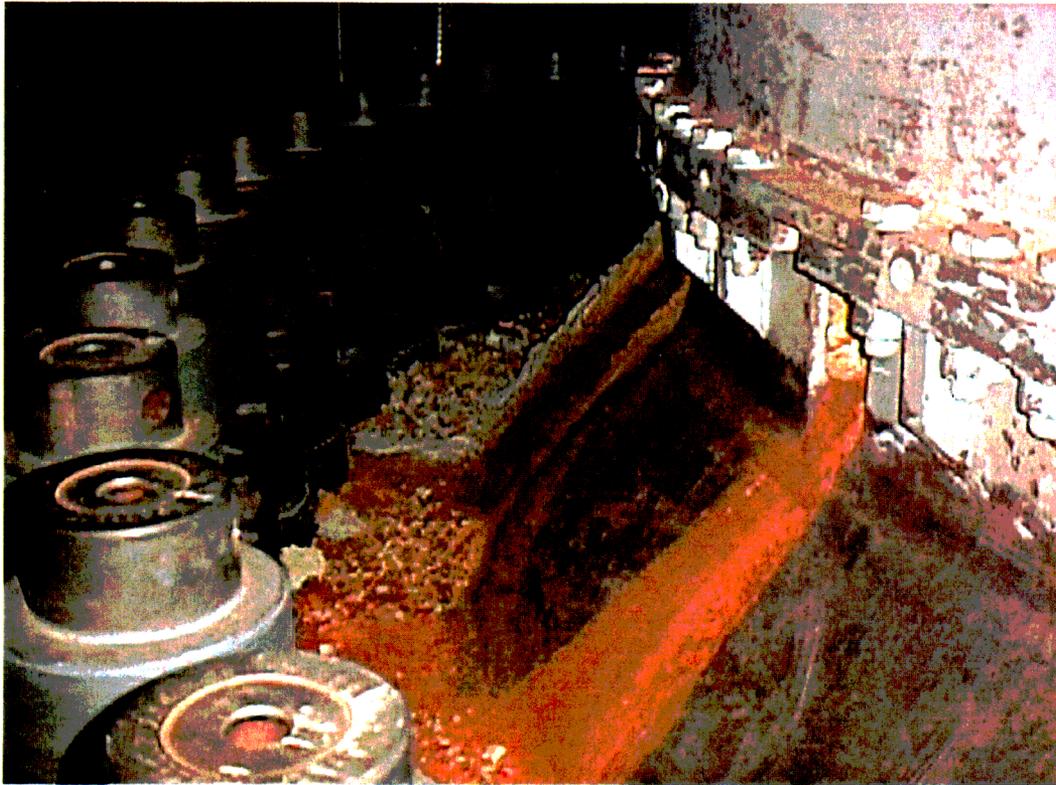
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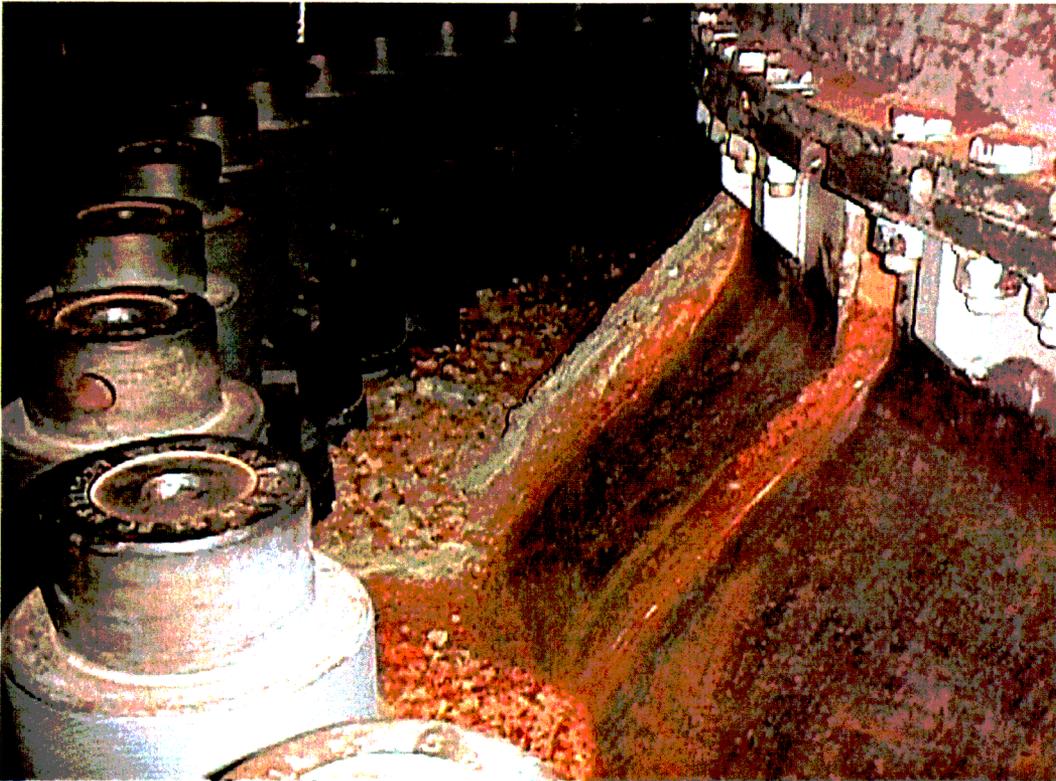
On north side facing east



On north side facing south east



On east side facing south



On east side facing south



On south side facing west



On south side facing west



On south side facing north

Reactor Vessel Head Boric Acid Leakage
4.6.00

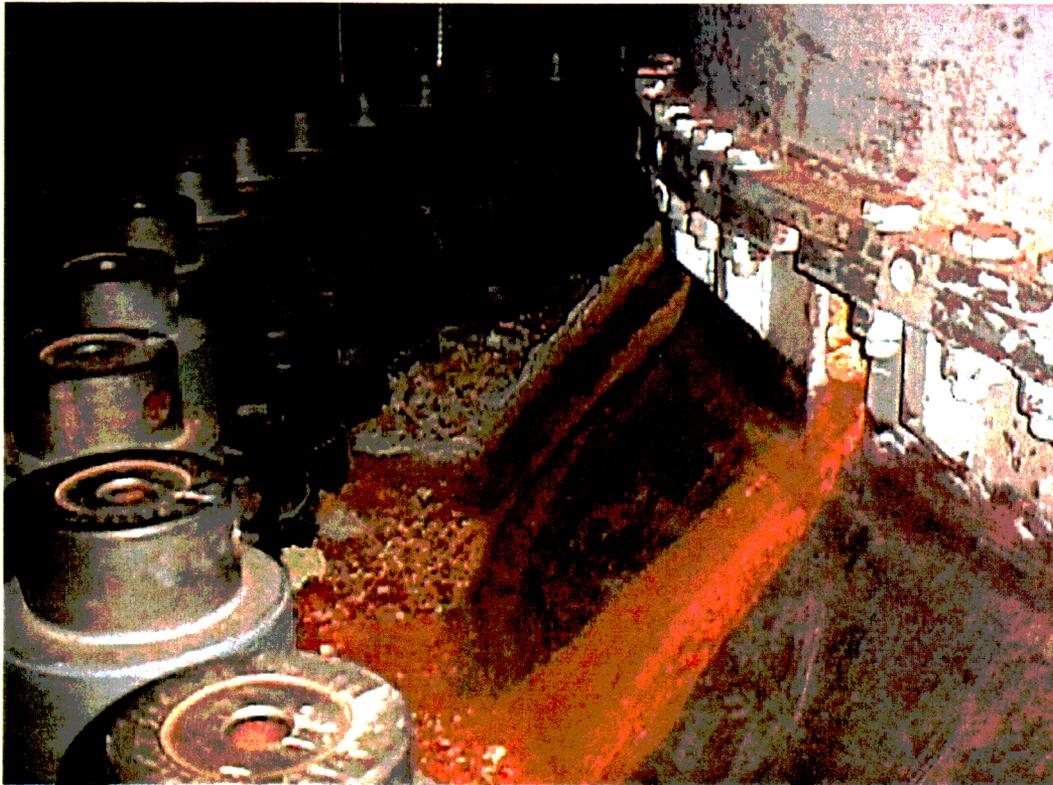
11250



On north side facing east



On north side facing south east



On east side facing south



On east side facing south



On south side facing west



On south side facing west



On south side facing north

Reactor Vessel Head Boric Acid Leakage
4.6.00

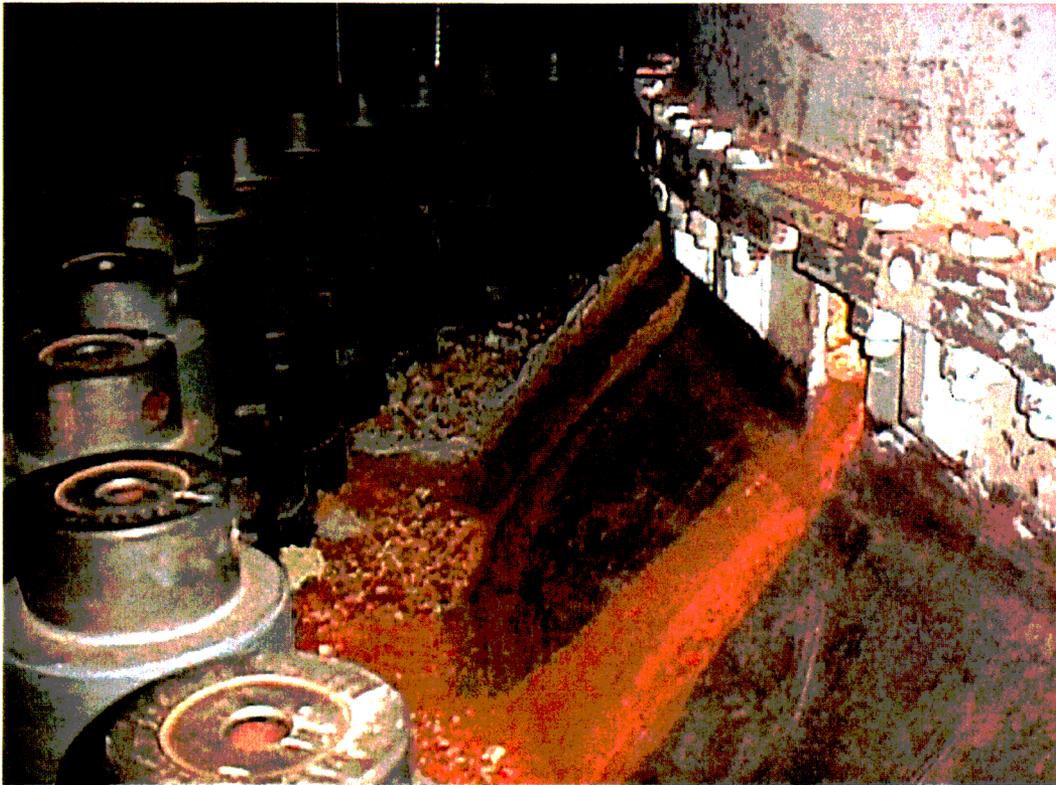
12RF7



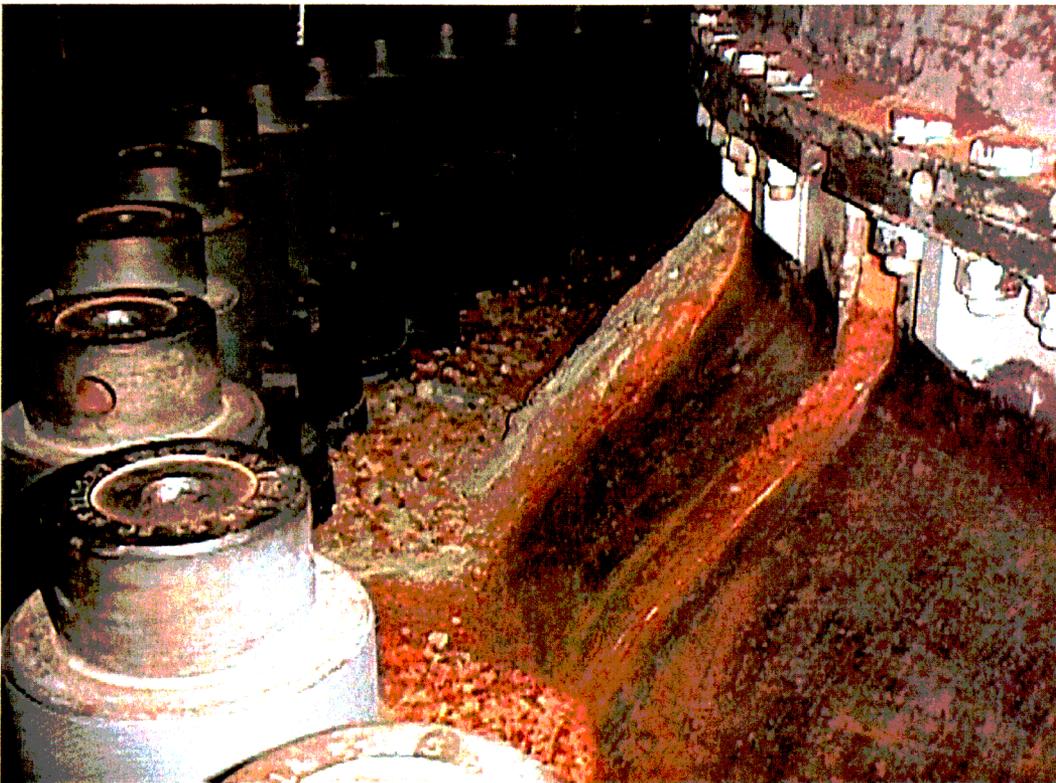
On north side facing east



On north side facing south east



On east side facing south



On east side facing south



On south side facing west



On south side facing west



On south side facing north