

NOTICE OF VIOLATION

Rochester Gas & Electric Corporation
R. E. Ginna Nuclear Power Plant

Docket No. 50-244
License No. DPR-18

During an NRC inspection conducted on various dates in April and May 1993 that concluded on June 18, 1993, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violation is listed below:

10 CFR 50, Appendix B, Criterion XVI, Corrective Action, states in part that "Measures shall be established to assure that conditions adverse to quality, such as failures, malfunctions, deficiencies, deviations, defective material and equipment, and nonconformances are promptly identified and corrected."

Contrary to the above, in April 1992 after a second service water valve failure of a non safety-related Crane Company model 101 XU valve due to stem to disc separation by corrosion, adequate corrective actions were not taken to identify degradation or the impact of similar failures of safety-related valves in that on March 28, 1993, the licensee identified locked open safety-related manual valves 4669 and 4738 in failed closed position with stems to discs separated.

This is a Severity Level IV violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, Rochester Gas & Electric Corporation is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region I, and a copy to the NRC Resident Inspector, within 30 days of the date of the letter transmitting this Notice. This reply should be clearly marked as a "Reply to a Notice of Violation" and should include for each violation: (1) the reason for the violation, or, if contested, the basis for the disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further violations, and (4) the date when full compliance will be achieved. If an adequate reply is not received within the time specified in this Notice, an order may be issued to show cause why the licensee should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.



Enclosure 2

Persons in Attendance at the July 16, 1993 Enforcement Conference

Rochester Gas and Electric Corporation

R. Marchionda, Superintendent, Production
T. Marlow, Department Manager, Quality Performance
R. Mecredy, Vice President, Ginna Nuclear Production
T. Newberry, Lead Mechanical Engineer
L. Sucheski, Structural Engineer
J. Widay, Plant Manager, Ginna
G. Wrobel, Manager, Nuclear Safety and Licensing

New York State Public Service Commission

K. Roenick, Nuclear Engineer

US Nuclear Regulatory Commission

W. Butler, Project Director, PD 1-3, NRR
J. Carrasco, Reactor Engineer, Region I
P. K. Eapen, Section Chief, Systems Section, Region I
H. Gregg, Senior Reactor Engineer, Region I
W. Hodges, Director, Division of Reactor Safety
D. Holody, Enforcement Officer, Region I
W. Lazarus, Section Chief, RPS-3B, DRP, Region I
J. Luehman, Senior Enforcement Specialist, OE
T. Moslak, Senior Resident Inspector, Ginna, Region I
D. Screnci, Field Public Affairs Officer, Region I
J. Tatum, Senior Reactor Engineer, NRR



GINNA STATION

ENFORCEMENT CONFERENCE

SERVICE WATER SYSTEM

Inspection Report 93-08

July 16, 1993

Enclosure 3



AGENDA

- Introduction R. C. Mecredy
- Background Information T. A. Marlow
- Actions in Response to Earlier Valve Failures T. A. Marlow
- Actions During 1993 Refueling Outage R. A. Marchionda
- Future Actions R. A. Marchionda
- Safety Implications G. J. Wrobel
- Plant Management Perspectives J. A. Widay
- Conclusions R. C. Mecredy
- Underground Piping Activities T. E. Newberry
- Conclusions R. C. Mecredy

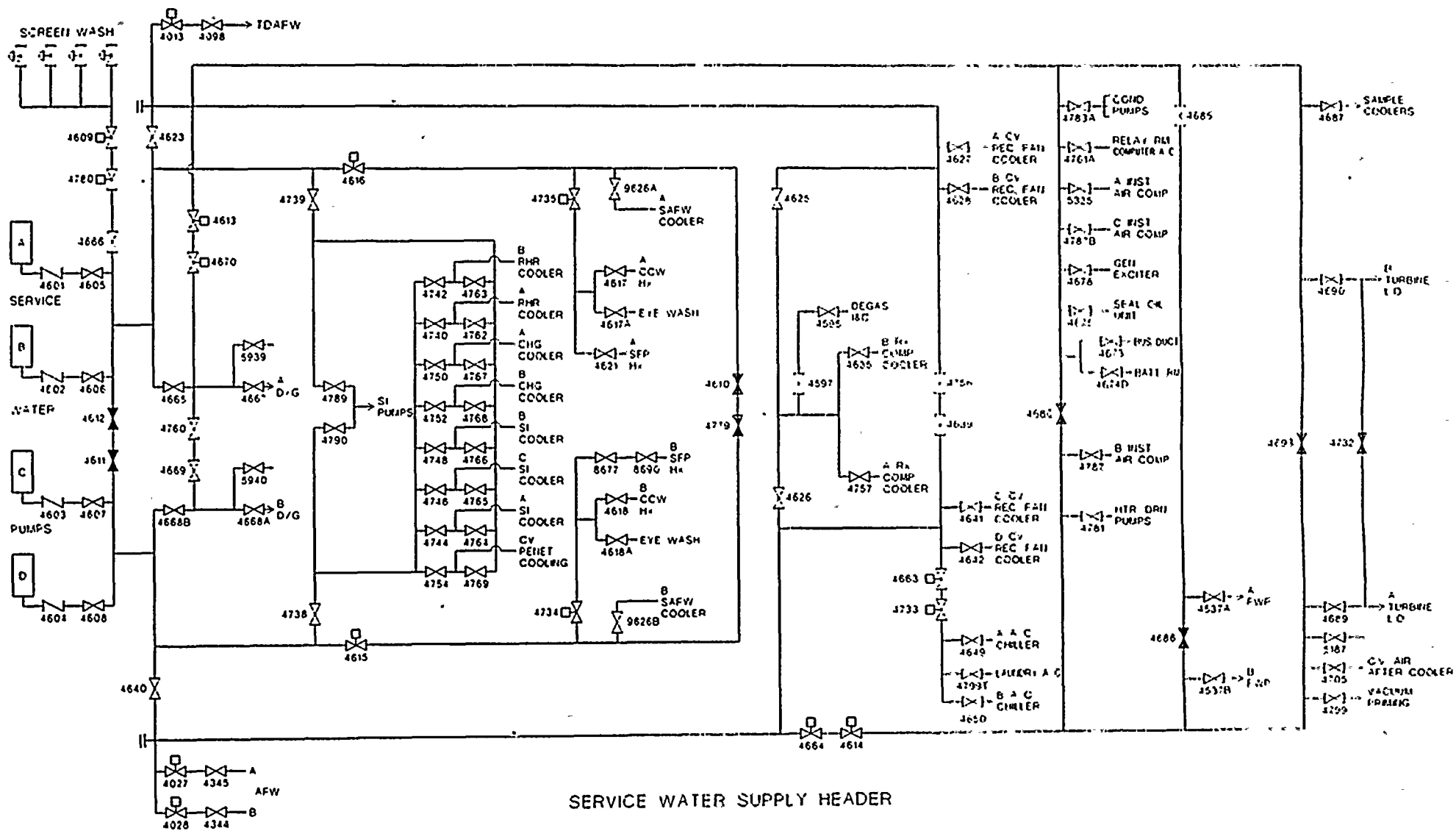
SERVICE WATER SYSTEM (SWS)
NRC ENFORCEMENT CONFERENCE

JULY 16, 1993

- Introduction
- Ginna SWS Design
- Ginna Reliability Centered Maintenance (RCM)
Project Related to SWS Program
- Ginna RCM Project Related to Valve Improvement
Project (VIP)
- Status VIP Scope through 1992
- 101XU Failure Discovery
- 101XU Failure Evaluation
- Comprehensive SWS 1993 Outage Preparation
- Conclusion

GINNA SERVICE WATER SYSTEM (SWS) DESIGN

- SWS Suction From Lake Ontario
- SWS Loops are Cross-Tied
- SWS Supplies Essential and Non-Essential Users
- SWS Isolates Non-Essential Users on SI and UV
- SWS is Normal Supply to Standby Auxiliary Feedwater System
- SWS is Alternate Supply to the Auxiliary Feedwater (AFW) System
- SWS Provides Cooling to Critical Loads During Accident Conditions
 - Spent Fuel Pit Heat Exchangers
 - Component Cooling Heat Exchangers
 - Emergency Diesel Generators
 - Containment Recirculation Fan Coolers
 - Safety Injection Pump Thrust Bearings
- Review Flowpath on Modified P&ID



SERVICE WATER SUPPLY HEADER

GINNA RCM PROJECT
(Related to VIP)

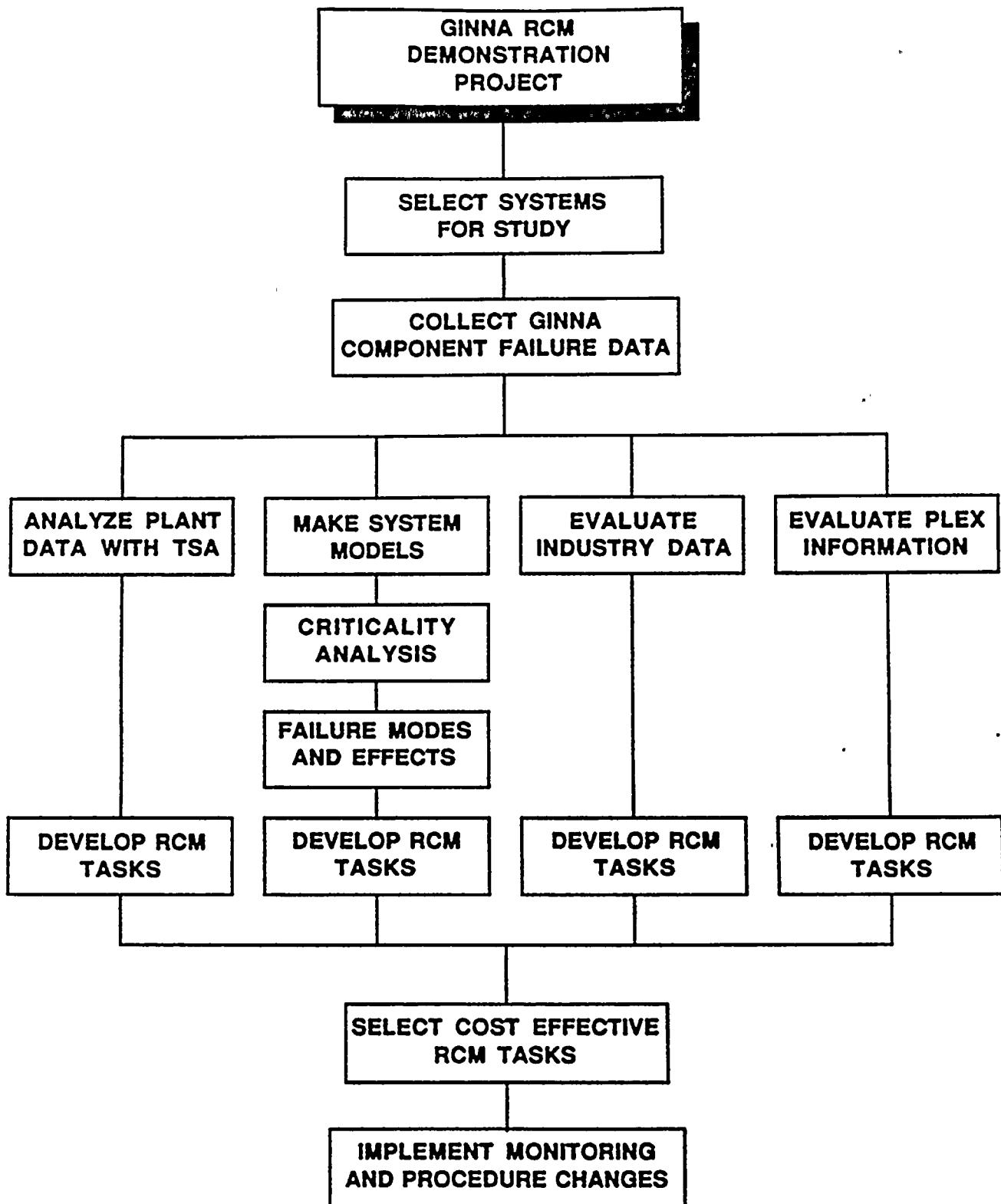
FLOW CHART

SYSTEM SELECTION CRITERIA

SYSTEM RANKING

SUMS

SERVICE WATER SYSTEM EFFORTS



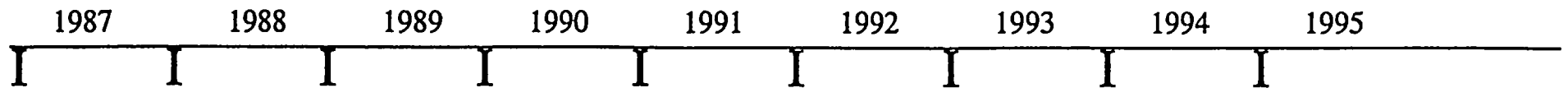
RCM SYSTEM RANKING WITH RESPECT TO ATTRIBUTES

Rankings	1	2	3	4	5	6
	Reactor Safety	Regulatory Concerns	Public Safety	Human Factors	Potential for Improvement	Combined
1.	SIS	D/G	RCS	TRB Gen	SW	SIS
2.	ESFA	RCS	S/G	MFW	MFW	ESFA
3.	RCS	ESFA	CNMT	ESFA	Water Treatment	S/G
4.	D/G	AFW	ESFA	S/G	Air	RCS
5.	AFW	CNMT	D/G	RCS	Waste Liquid	D/G
6.	Elect DC	S/G	SIS	D/G	Incore Ins.	AFW
7.	RPS	SIS	RHR	RPS	RPS	RPS
8.	RHR	RPS	RPS	Fire Protection	Elect DC	Elect DC
9.	SW	RHR	CRD	SIS	Heat Steam	RHR
10.	CNMT	Elect DC	Fire Protection	AFW	TRB Gen	SW
11.	CNMT Spray	CRD	AFW	Main Steam	HVAC	CNMT
12.	S/G	Elect AC	Elect DC	RHR	Extr. Steam	CNMT Spray

enfconf:6

RCM SUMS SYSTEM SELECTION

- Auxiliary Feedwater System
- Safety Injection System
- Residual Heat Removal System
- Diesel Generator
- Service Water System



[RCM History Reviews]

- I 1989 AI&O CCW Heat Exchanger, SFP Heat Exchanger Eddy Current Inspection
- I (6/89) SW Project Planning (SW Operability, MOVs, Bolting)
- I (7/89) GL 89-13
- I (4/90) SW Hx Fouling Inspection
- I (5/90) First 101XU Failure (NSR) - Valve V-4675
- I (9/90) Attend EPRI Seminar on Service Water Reliability Improvements
- I (1/91) SW RCM Analysis Complete
- I (5/91) SW Valve Refurbishment/replacement Scope (101XUs)
 - [5/91 - SW Valve Planning/Scheduling]
- I (8/91) SWSROP Complete
- I (12/91) NRC SW Inspection
- I (4/92) Second 101XU Failure (NSR) - Valve V-4690
- I (4/93) SW Valve & Comp. Insp - Phase 5
- I SW Valve & Comp Insp - Phase 6

GINNA VALVE INSPECTION PROGRAM

SCOPE

OBJECTIVES

DETAILS

IMPLEMENTATION STATUS

TYPICAL GINNA OUTAGE VALVE/ACTUATOR PROGRAM

Defined Scope

- Prioritized Manual Valves (Checks, Gates, Globe)
- Disassembly
 - Inspection
 - Refurbishment
- MOV Actuators
 - Disassembly
 - Inspection
 - Refurbishment
 - Diagnostic Testing

Objectives

- Continued Documentary on Actual Conditions of Valves
- Upgrade based on Vendor Improvements
- Upgraded Based on Industry Operating Experience

Details

- Root Cause Analysis for Major Defects
- New Plant Procedures
- Spare Parts Planning
- Results Incorporated into RCM Living Program

Implementation Status (Next Slide)

VALVE INSPECTION/REFURBISHMENT PROGRAM

YEARS	SCOPE	SYSTEMS
1989	34 Valves 21 MOV Actuators 31 MOV MOVATS Diagnostic	RCS, RHR, SI
1990	39 Valves 24 MOV Actuators 28 MOV MOVATS Diagnostic	AFW, CCW, CS, CVCS, SI, RHR
1991	69 Valves 23 MOV Actuators 29 MOV MOVATS Diagnostic	SI, AFW, SBAFW, MFW, CW, SW (4 Act., 2 Vlvs)
1992	40 Valves 11 MOV Actuators 15 MOV MOVATS Diagnostic	AFW, CW, MFW, SI, SBAFW, SW (4 Act., 2 Vlvs)

101XU FAILURE PRESENTATION

Discovery

- 101XU Failure Discovery

Assessment

- Applicability of Failure as Generic Concern Known at RG&E
- No Additional Industry Failure Data Available

Evaluation

- Generic Assessment on Safeguards Equipment
 - Emergency Diesel Generators
 - Auxiliary Feedwater System
 - Safety Injection System

Feedback

- 1992 Outage Feedback
- Motivation Focused on Comprehensive SWS Corrective Action

Program

- Review 1993 Service Water Outage Preparations & Logistics
- Conclusion

101XU FAILURE PRESENTATION DISCOVERY

May 1990

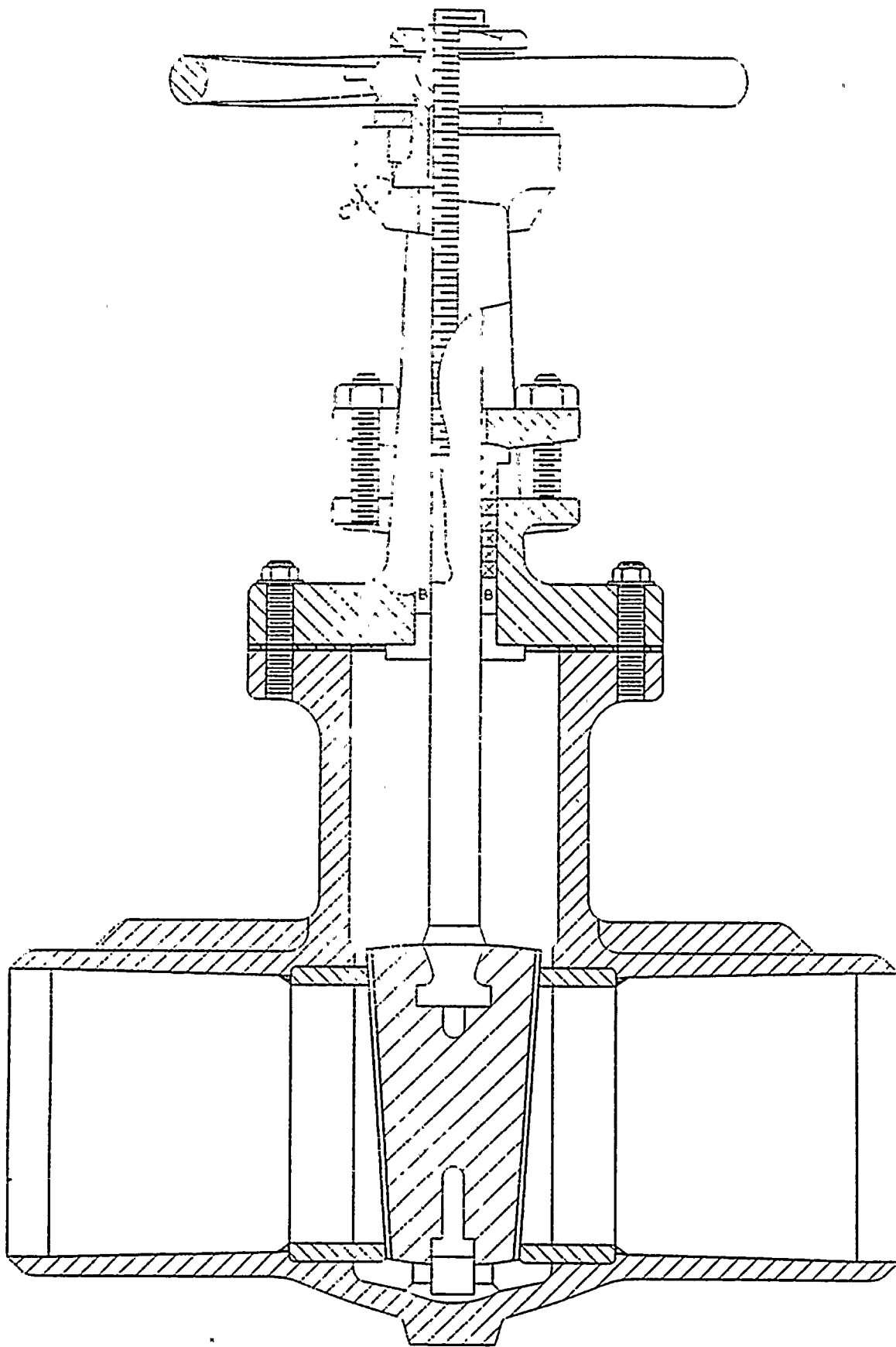
- First Failure - Valve V-4675
 - Valve V-4675 Inlet to Turbine Generator Seal Oil Heat Exchanger

Failure Detected

- Valve V-4675 Closed for Maintenance

Valve Material Condition

- Post-Maintenance Restoration
- Valve V-4675 Inspection
- Temporary Repair Performed



CRANE, GATE VALVE, MODEL NO. 101-XU

101XU FAILURE PRESENTATION DISCOVERY

April 1991

- Second Failure Assumed Valve V-4690
 - Valve V-4690 Inlet to Turbine Lube Oil Cooler "B"

Failure Detected

- Valve V-4690 Close to Provide for Eddy Current Inspection
- Valve V-4690 Realigned for Service
- "B" Lube Oil Cooler MCB Alarm
- Safety Evaluation Performed (Undocumented)

**101XU FAILURE PRESENTATION
ASSESSMENT**

May 1991

- Research Generic Application of 101XU With Respect To Safety Related Service Water System
- Plant Superintendent Letter (5/22/91)
 - Scope
 - EWR-5098
 - Bolting
 - Replacement Valves
 - Strategy
 - Isolation of Service Water System
 - Coordination of Service Water Projects
 - Procurement
 - Milestone Schedule

Valves Selected for Refurbishment/Replacement

<u>SWS Component</u>	<u>Size</u>	<u>Model</u>
V-4669	4"	101XU
V-4760	4"	101XU
V-4612	4"	101XU
V-4611	4"	101XU
V-4621	6"	101XU
V-4738	3"	101XU
V-4739	3"	101XU

101XU FAILURE PRESENTATION ASSESSMENT

June 1991

- June 13, 1991 - Plant Service Water System Project Manager Meeting Minutes
- EWR-5098 To Replace Additional Valves

Valves Selected for Refurbishment/Replacement

<u>SWS Component</u>	<u>Size</u>	<u>Model</u>
V-4738	3"	101XU
V-4739	3"	101XU
V-4675	3"	101XU

101XU FAILURE PRESENTATION
Emergency Diesel Generators Evaluation
April 1991

Detectability of Functional Failure

- Twice Per Shift Operator Logs of SW Pressure
 - Jacket Water Heat Exchanger
 - Lube Oil Heat Exchanger
- Monthly PT Diesel Engine Parameter Trending
 - Jacket Water Temp
 - Lube Oil Temp
- Diesel Panel Alarms
 - "A" Diesel AR-D/G-A-9 Jacket Water Temp
AR-D/G-A-11 Lube Oil Temp
 - "B" Diesel AR-D/G-B-9 Jacket Water Temp
AR-D/G-B-11 Lube Oil Temp

Contingency

- Four Inch Normal Supply in Addition to Cross-Ties
- Fire Water System Backup - Capability
- EOP Support

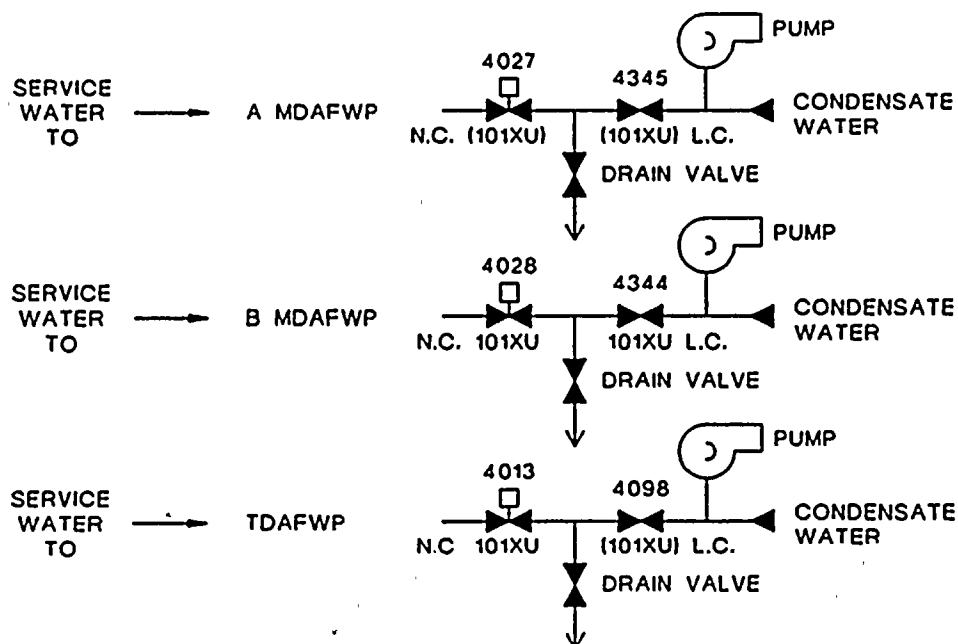
101XU PRESENTATION

Auxiliary Feedwater System

April 1991

Detectability of Functional Failures

- Standby Auxiliary Feedwater Backup
- EOP Support
- Bearing Flow Verified by Operator Twice Per Shift
- Monthly Periodic Tests
 - Cycles Not Closed MOV Actuated 101XU Valves
 - Cycles Manual 101 XU Valves
 - Functionality of Valves Verified by Downstream Flush



101XU FAILURE PRESENTATION

Safety Injection System Evaluation

April 1991

- Redundant Supply
- Monthly PT - Bearing Temp Checked
- Periodic Test Procedure Requires Restoration Valves Upon Safety Injection Immediately
- Quarterly PT - Bearing Temp Checked, Vibration Recorded
- Annual Bearing Flush per M-11.12.2, "#1-A, 1-B, 1-C Safety Injection Pump O.B. Jacketed Bearing Service Water Cooling System Maintenance"
- Indirect Visual Feedback (sweating)

101XU FAILURE PRESENTATION
1992 Outage Feedback

Second Failure Confirmed - Valve V-4690

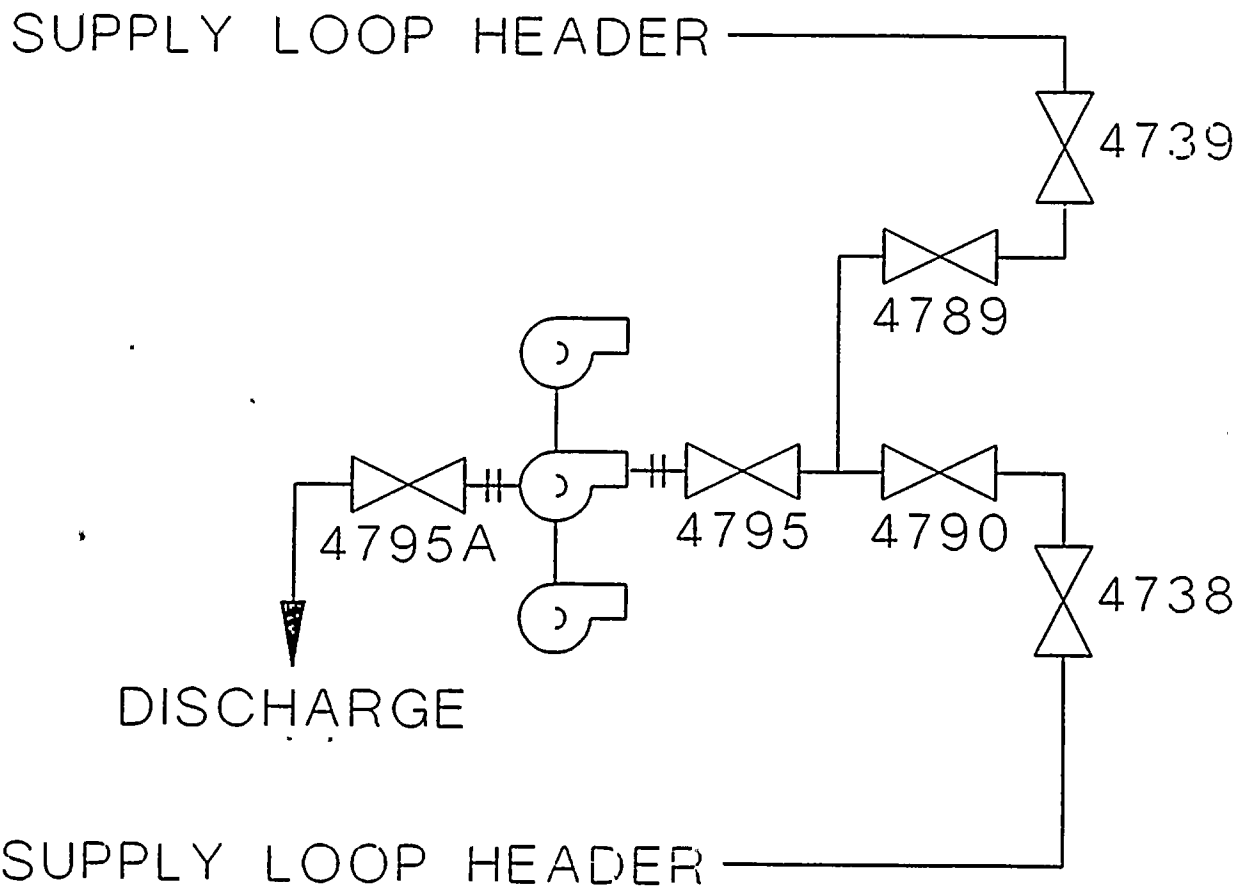
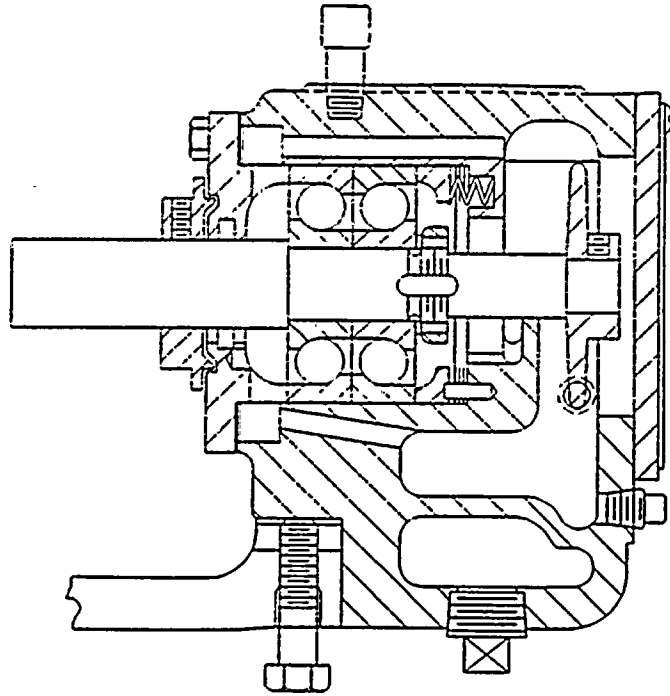
Air Condition Water Chiller

- Contractor Pilot Replacement Program
- Two 101XU Valves Replaced
 - V-4649
 - V-4650
- Inspection Results
 - Corrosion Evident
 - Stem to Disc T-Slot Intact

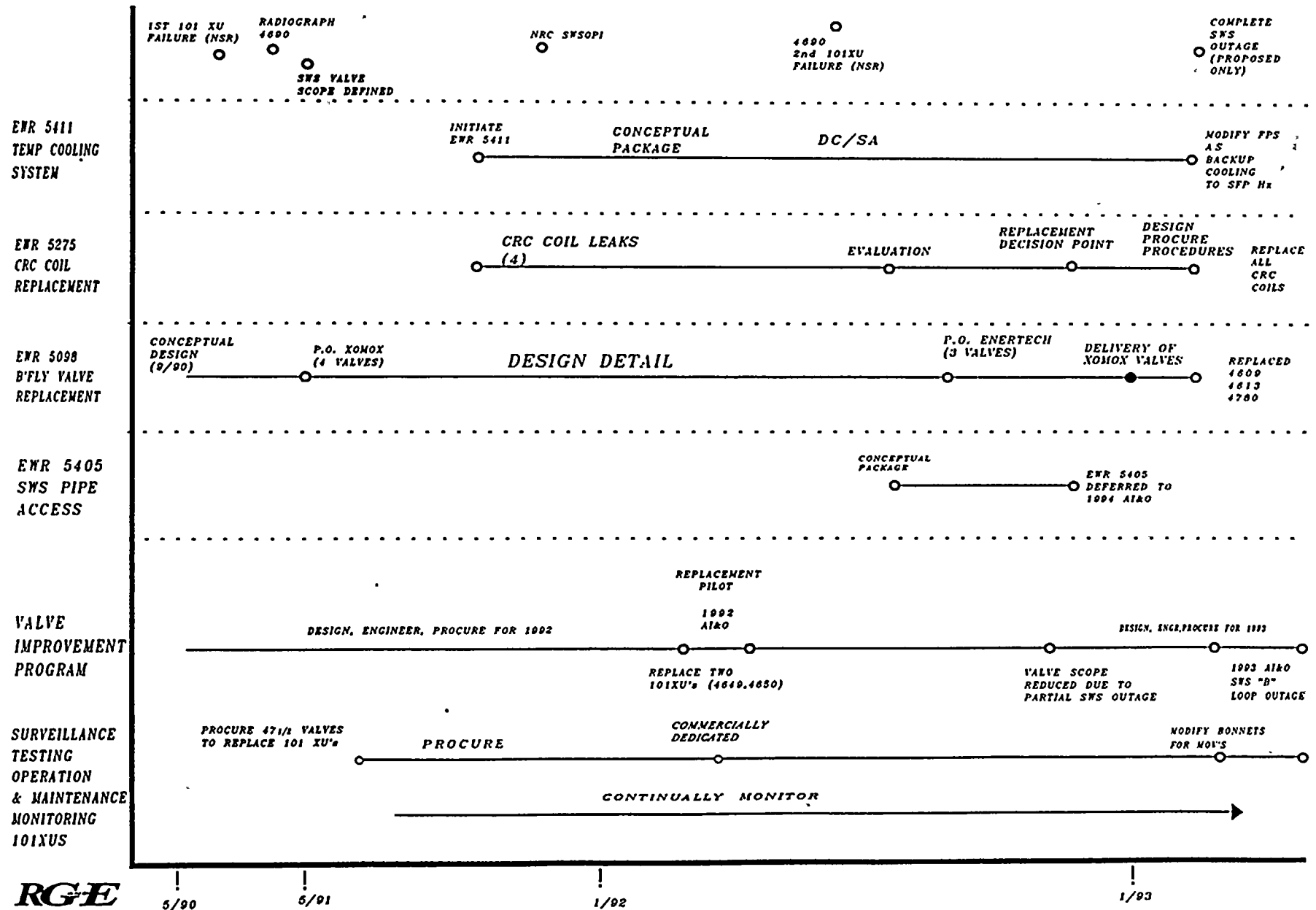
■ M-11.12.2 Annual Bearing Flush Safety Injection Pumps (SIPs) Results

- All SIP Bearings Clean
 - Flow Present
-
- Evaluation Remained Valid
 - No Change in Program Direction

SAFETY INJECTION PUMP THRUST BEARING COOLING



1993 SWS OUTAGE PREPARATION PROJECT



RG-E
L:\TM1.CH3

5/90

5/91

1/92

1/93

enfcnf:72

101XU FAILURE PRESENTATION

Overall Conclusions

- Had Experienced Component Failures
- Recognized 101XUs Installed in Safety Related Systems
- Recognized Need for Inspection and Replacement Program Prior to Confirming Second Failure
- Evaluation to Detect Functional Failure on Safeguards Equipment
- 1992 Outage Feedback - Two 101XUs Found Operable
- 1993 SWS Program Established Sensitive to 101XU Valves
- Failures Detected (Self Identified) During 1993 AI&O
- Though Redundancy Reduced, No Functional Failures Occurred
- Aggressive Corrective Action Performed During 1993 AI&O
- FURTHER DETECTION, FURTHER CORRECTIVE ACTION

GINNA VALVE INSPECTION PROGRAM (PHASE 5)

Scope

- 41 Valve Refurbish/Replacements
- 7 Actuators
- 25 MOV Diagnostics
- 450 Total Valves

Results

- Slight to Severe Corrosion of Valve Body Guides
- Slight to Severe Corrosion of Carbon Steel Disc's
- Silt and Corrosion Build-up Inside Some Valves and Pipes
- Some Pitting, Scratches, and Cracks in Seat Surfaces
- + Larger Valves Having Carbon Steel Discs Had Corrosion; However, Larger Volume of Metal Resulted in Lower Probability of Failure
- + Stainless Steel and Bronze Components Did Not Experience Abnormal Degradation
- + Did Not Observe Significant Pipe Wall Thinning or Pitting
- + Severe Carbon Steel Disc Corrosion Did Not Occur on Closed Valves in the Service Water System
- + Carbon Steel Disc Corrosion Did Not Occur on Valves Installed in Non-Service System

SERVICE WATER VALVE INSPECTION AS-FOUND CONDITIONS

	<u>VALVE</u>	<u>MAKE</u>	<u>CONDITION</u>
*	MOV-4780	Rockwell	Scale Build-up Prevent Full Closure
*	MOV-4609	Rockwell	Good Condition
*	MOV-4611	Crane 101XU	Good Condition
	V-4640	Crane 155	No Corrosion, Seat Defects
*	MOV-4013	Crane 101XU	Slight Corrosion Wedge, Silt
*	MOV-4027	Crane 101XU	Slight Corrosion Wedge, Silt
*	MOV-4028	Crane 101XU	Slight Corrosion Wedge, Silt
	V-4098	Crane 101XU	Good Condition
	MOV-4613	Crane 101XU	Extensive Corrosion
*	V-4760	Crane 101XU	Extensive Corrosion Disc & Guide
*	V-4669	Crane 101XU	Disc and Stem Separated
	V-4668B	Velan	Good Condition, Corrosion Guide
	V-4345	Crane 101XU	Good Condition
	V-4344	Crane 101XU	Good Condition
*	V-4739	Crane 101XU	Extensive Corrosion Disc & Guide
*	V-4738	Crane 101XU	Disc and Stem Separated
	MOV-4615	Crane 155	Seat Defects
	V-4635	Atwood Morrill	Good Condition
	V-9626A	Borg Warner	Good Condition
	V-4618	Crane 150	Seat Defects
	V-4779	Crane 155	Good Condition
	V-4625	Crane 47½ XU	Good Condition, Lapped Seats
	V-4626	Crane 47½ XU	Seat Defects
	MOV-4664	Crane 47½ XU	Corroded Guide and Bolting
	V-4757	Atwood Morrill	Good Condition
	V-4627	Atwood Morrill	Good Condition
	V-4628	Atwood Morrill	Good Condition
	V-4756	Crane 150	Good Condition, Seat Pitting
	V-4641	Atwood Morrill	Good Condition
	V-4642	Atwood Morrill	Good Condition

SERVICE WATER VALVE INSPECTION
AS-FOUND CONDITIONS
(contd)

	<u>VALVE</u>	<u>MAKE</u>	<u>CONDITION</u>
*	MOV-4663	Crane 101 XU	Extensive Corrosion Disc & Guide
*	V-4678	Crane 101 XU	Corrosion Disc & Guide
*	V-4675	Crane 101 XU	Extensive Corrosion Disc & Guide
*	V-4690	Crane 101 XU	Extensive Corrosion Disc & Guide
*	V-4732	Crane 101 XU	Corrosion Disc & Guide
*	V-4689	Crane 101 XU	Extensive Corrosion Disc & Guide
*	V-4674	Crane 143 ½ XR	Plug Unscrewed From Stem
	V-4758	Atwood Morrill	Good Condition
	V-4636	Atwood Morrill	Good Condition
*	Valves Replaced		

CRANE 101XU VALVES

Application

- 27 Original Equipment Valves Were Installed
- 17 Valves Installed in Service Water System
- 7 Installed in Component Cooling Water System
- 3 Installed in Auxiliary Feedwater System

Inspection Scope

- 6 Valves Scheduled for Inspection
- 8 Service Water Valves Added to Inspection Scope
- 3 Auxiliary Feedwater Valves Added to Scope
- 1 Component Cooling Water Valve Added to Scope

CRANE 101XU VALVES

Present Status

- 14 Valves in Service Water System Were Replaced With Crane 47 1/2 Valves
- 3 Valves in Auxiliary Feedwater System Were Inspection and Refurbished
- 1 Valve in Component Cooling System Inspected and Refurbished
- 3 Valves in the Service Water System Were Not Inspected
 - + Two Are Normally Closed Valves, Not Required to be Open
 - + Remaining Valve is Normally Open on an Instrumented Heat Exchanger Where Failure Would be Detected

SERVICE WATER VALVE INSPECTION

Future Activities

1994

- Replace the Remaining 13 Crane 101XU Valves
- Replace the Remaining Four Butterfly Valves
- Remove "A" Loop from Service and Perform Phase 6 Inspection Scope

1995

- Complete Phase 7 of Valve Inspection Program

SAFETY IMPLICATIONS

1. Was SI Pump Damaged During PT-2.7 With Valve V-4739 Closed?

No. SI Pump Does Not Operate During PT-2.7.
Subsequent Testing of SI Pump Indicates Acceptable Performance.

2. Could SI Pump Have Operated if Accident Occurred During PT-2.7?

Yes. Procedure A-1101 Provides Assurance of System Realignment.

Conservatively Estimate Time to Realign: 20 Minutes -
5 R&T Personnel in Field During Test

Design Analysis DA-ME-93-101 Indicates Pump
Operation for at Least 20 Minutes Without SW Cooling

High Confidence of Extended (Hours -- Indefinite)
Operational Capability Without Service Water Cooling
Based On:

- Test of Comparable (TDAFW) Pump
- Pump Vendor Correspondence
- "Cool" Water Being Pumped (175°F)
- High Pump Recirculation Flowrate

**Conclusion: SI Pumps Operable - Valve V-4739
Operable**

SAFETY IMPLICATIONS (contd)

3. What If Valve V-4739 Failure During Previous PT?

Failure of Both Valves V-4738 and V-4739 Detectable
By SI Pump Monthly PTs

4. What if Valve V-4739 Failed During Postulated Accident?

High Confidence of Extended Operational Capability
Pumping Cool Water

FR-C.1 and FR-C.2 Provide Guidance for Loss of SI:

- Heat Removal and Depressurization Via Steam Generators
- Inventory Control Via Charging and Accumulators

Not Explicitly Analyzed in UFSAR Accident Analysis -
Beyond Design Basis

COMPARISON OF PUMPS/BEARINGS

SI Pump: 3-WTS-811 With Double
Ball Thrust Bearing
3550 RPM

TDAFW: 3-WTL-87 With Double Ball Thrust Bearing
4650 RPM

PLANT MANAGEMENT PERSPECTIVES

Lessons Learned - Opportunities for Improvement

- Passive Failure Identification
- In-Situ Diagnostics
- Enhanced Inspection Program
- Increased Sensitivity for Generic Application

Industry Applicability

- Nuclear Network
- Voluntary LER

Future Actions

- Completion of Valve Improvement Program
- Augmented Preventive Maintenance Schedule



ENFORCEMENT CONFERENCE

Conclusions

- RG&E has implemented a comprehensive valve inspection, refurbishment, and upgrade program
- Although not documented, plant management did assess the common mode safety impact of non-safety-related valve failure on safety systems
- Required safety functions were not compromised by 1993 outage findings

Underground Piping

Purpose of Discussion:

1. Describe the potential underground leak from the Ginna Service Water System and its safety assessment.
2. Discuss RG&E's plans.

Background

Leak Identification:

1. Standing water was identified on the floor of the Screenhouse basement in WR/TR #9122322. The water was entering through the wall penetration for the Circulating Water lines.
2. The water was analyzed for the presence of chlorine both during a SW chlorination period and a non-chlorination period. The concentration and trend of chlorine in the water indicated that it can be SW. For the purpose of assessing safety, the water in the Screenhouse basement is assumed to be entirely SW.
3. NCR 92-001 now controls this issue.

Piping Design:

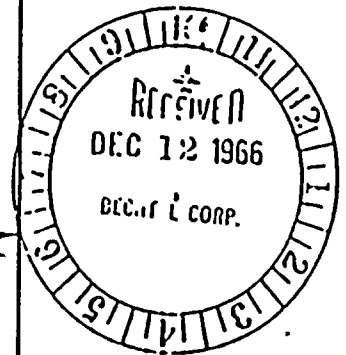
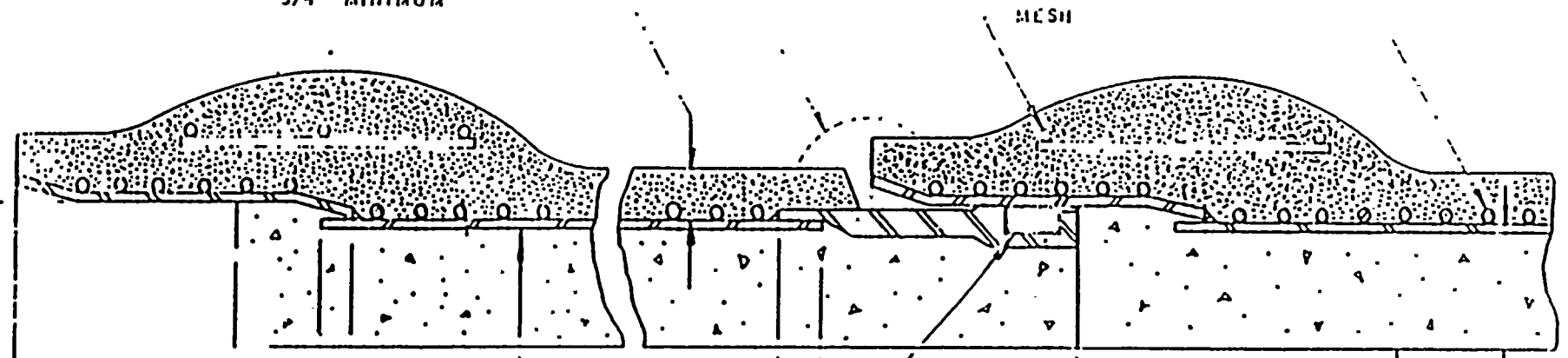
1. The underground Service Water pipe is constructed per AWWA C301-58 from 3/16" structural steel plate seam welded with a concrete liner. The pipe is wrapped with a high strength wire mesh and cast or grouted on the exterior with concrete. The end connections are bell and spigot type with the joint mortared on the exterior. See Price Brothers drawing D-340-A (attached).
2. The pipe is laid into a concrete cradle with horizontal changes of direction placed in concrete thrust blocks. See RG&E drawings 33013-54-J and 33013-53-B as separate illustrations and SK-BUGRDL attached. Also attached is a copy of an original construction photograph.

3/4" MINIMUM
REQUIRED THICKNESS

AFTER PIPE IS LAID

REINFORCEMENT, SPICALLY WOUND
PITCH AS REQUIRED BY DESIGN

HOPEAR COATING
1/8" NOMINAL
3/4" MINIMUM



This drawing is APPROVED as CORRECTED for general data and dimensions only.

Byrne Unit I
Having Service
R. E. Smith

DATE 2-16-67

16 GAL OR HEAVIER TEE IS REQUIRED BY DESIGN

BELL DIAMETER

NOMINAL INSIDE PIPE DIAMETER

CORE THICKNESS

CONFORM TO ANCHORAGE GAS AND ELECTRIC CORPORATION SPECIFICATIONS WITH A.M.S. C-361

LAYING LENGTH (HATTIESBURG, MISS.)
16 NOMINAL LENGTH
20.03' LAYING LENGTH
20' NOMINAL LENGTH (DAYTON, OHIO & PONTIAC, MICH.)

B 50-65 CM 2- -65
A 19-64 CM 3-16-64

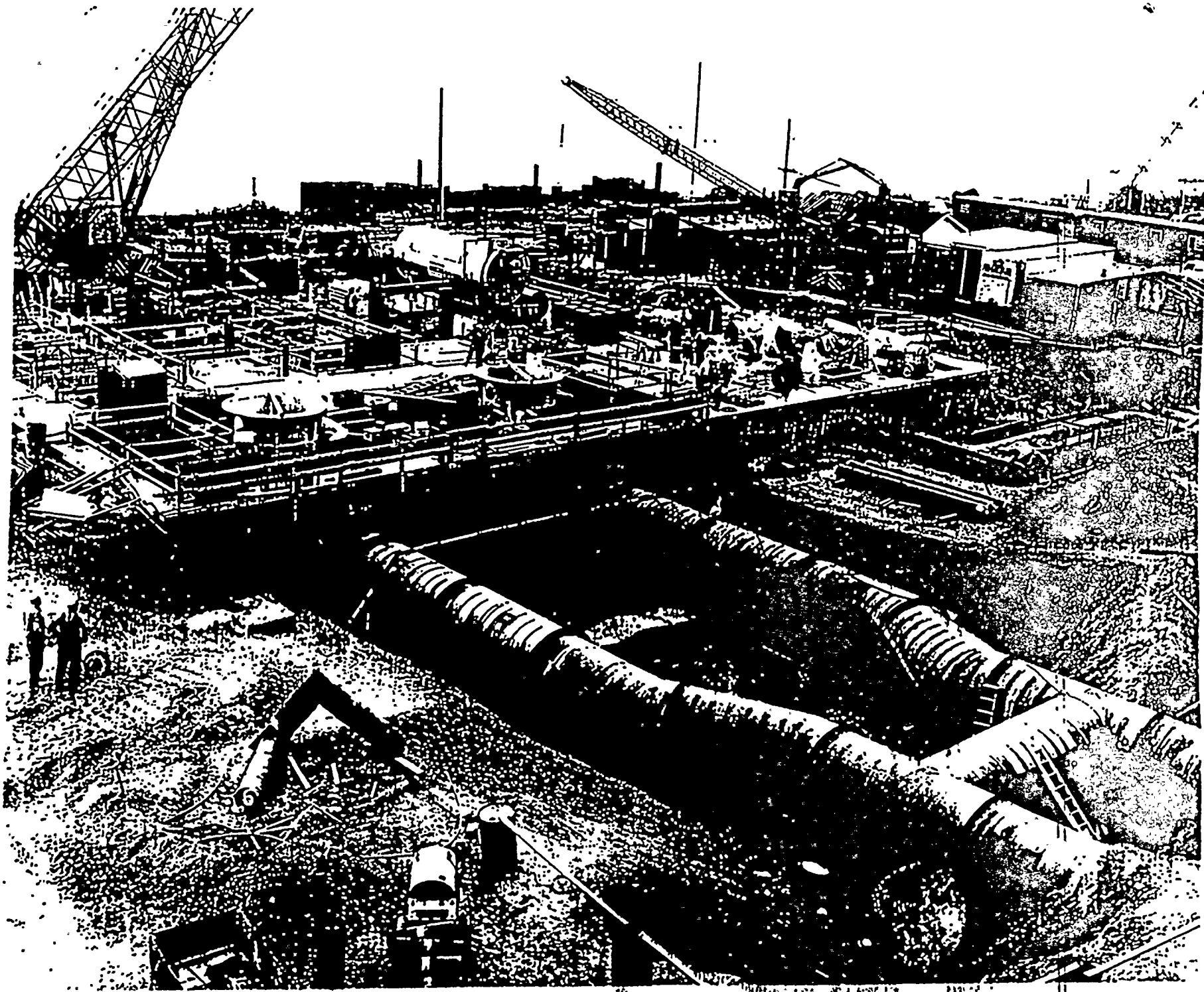
PRICE BROTHERS CO.
DAYTON, OHIO

Ontario Center, New York
Job 5807
Bid - REQR-11

TYPICAL JOINT
16" 10" 20" SP-5 PIPE, PRESTRESSED
SCALE NONE DATE 6-15-69

PROJECT NO. 287.66 - 2
DRAWING NO. D-340-A

A	B	C	D	E	F	WEIGHT #/L.F.
16	1"	3 1/4"	5"	4 1/2"	18 1/2"	140
18	1 1/8"	3 1/4"	5"	4 1/2"	20 3/4"	155
20	1 1/4"	3 1/4"	5"	4 1/2"	23"	185



Assessment

Piping Design Assessment:

1. The most likely location for a leak is through one of the bell and spigot joints to the elbows that bring the Service Water line under the Circulating Water lines. The leak is not considered likely in the weld since the prestressed exterior provides a major portion of the structural strength and the inner concrete liner provides resistance to water passing through to the location of the weld defect.
2. Nuclear Network was searched for the topics "underground" or "buried pipe". A variety of construction methods, materials and failures are present. The construction methods described are significantly different than at Ginna Station. Based on this search, the industry has not experienced significant leakage or required extensive maintenance of the type of piping found at Ginna Station.

Screenhouse In-Leakage Assessment:

1. The Screenhouse in-leakage has been at nominally 1 gpm, depending on the amount of groundwater contributing to the sump flow. Note that in monitoring the sump flow, an increase to 5 gpm prompts further action immediately.
2. Leakage from the Service Water system has been evaluated in EWR 10110. This EWR examined the 1993 SI alignment SW system flow test data. The components most sensitive to leakage from the system headers are the Containment Air Coolers. The design required flow is 970 gpm per cooler and the test had a minimum cooler flow of 1080 gpm. Significant leakage on the order of 200-300 gpm over the test conditions (including the current SW header condition) could be experienced without affecting design requirements.
3. The system was justified for continued operation in NCR 92-001 based on the adequacy of Service Water supply, the monitoring measures to identify significant leakage increases, and the significant structural design capability of the underground piping.

Actions to Date

Evaluated Design:

1. As described above, the design has significant structural strength and the pressure boundary is not susceptible to general degradation.
2. The weakest pressure retaining element is the bell and spigot joint particularly where there are changes in direction not in thrust blocks.

Monitoring:

1. Quantified leak into screen house via sump actuations, Operators record the basement sump elapsed time from an installed counter as part of their rounds.
2. Established an action limit of 5 gpm to ensure that any change in the leak characteristic is evaluated prior to significantly degrading the margin above the required Service Water flow rate.

Actions Planned through '94 Outage

Monitoring:

1. Continue monitoring Screenhouse basement sump actuations.
2. Evaluate and implement, where appropriate, techniques for more precisely locating the source of the water. This may include taking core samples of the soil or utilizing a dye or tracer.

Inspection:

1. Resolve any comments on the design provided for installing access flanges to the underground piping and install the flanges.
2. Select the robotic inspection device for verifying the internal material condition of the piping and perform the inspection.

Repairs:

1. If the material condition of the pipe is as expected without fissures in the concrete liner and no significant gap in the seam at the bell and spigot joint, a continued program of monitoring and inspection may be invoked.
2. If there is material degradation of the pipe, the appropriate repair will be implemented. The most probable path will be to use a "sleeve" design that can be installed from the flanged access without excavation.

Conclusions

Underground Leak and Safety Assessment:

1. Any SW underground leak is most likely located at one of the bell and spigot joints near the Circulating Water lines.
2. The Screenhouse in-leakage is monitored and stable.
3. The Screenhouse in-leakage is small when compared to the allowable of 200-300 gpm.

Plans:

1. Continue monitoring Screenhouse basement sump flow.
2. Inspect the internal material condition of both underground headers.
3. Repair as indicated by significant changes in leak status or results of material condition inspection.



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Conclusions

- Ginna underground service water system piping leakage is believed to be small and stable
- Sudden increase in leakage is highly unlikely
- Substantial flow margin availability
- 1994 outage inspection program still under development
- Additional monitoring planned
- Inspection of piping internals will rectify absence of anomalies in pipe condition



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Conclusions

(continued)

- Based on piping design, lack of identifiable catastrophic failure mechanism, and large margin of safety to required flow, current safe operation is assured
- RG&E will keep NRC staff informed of plans