SECTION 8

PLANT MAINTENANCE RECOMMENDATIONS

8.1 TECHNICAL MAINTENANCE RECOMMENDATIONS

Appendix D contains a valve packing report which evaluates the performance of several packing materials. The recommendations of the report can help increase plant availability.

The Westinghouse Technical Bulletins have been reviewed for applicability to Salem No. 1. They are included in Appendix E.

The Westinghouse Data Letters have been reviewed for applicability to Salem No. 1 and are included in Appendix F.

8.2 WESTINGHOUSE REACTOR COOLANT PUMP AVAILABILITY IMPROVEMENT PROGRAM FOR OPERATING PLANTS

8.2.1 INTRODUCTION

Westinghouse, in conjunction with the utility, will provide an in-depth, on-site joint study program to identify and recommend measures to increase plant availability through improved Reactor Coolant Pump System performance and maintenance.

The need for this type of program is evidenced through Reactor Coolant Pump Operating System problems reported in the NRC Grey Book and supplemented by direct operating plant feedback.

8.2.2 DESCRIPTION

The implementation of this on-site program involves:

1. The identification and detailed investigation of past RCP problems.

APPENDIX F

W DATA LETTERS

FOIA - 86-790
C/6

AV06M/01M-121

Attachment 6

Data Letters Index

NUMBER	DATE	SUBJECT
59-3	12-18-59	Piping (freeze plugs)
60-2	02-23-60	Field Testing of Solas
61-1	08-09-68	Welding to Primary Plant Piping
61-3	03-20-61	Erection Data
62-3	01-28-69	Lubricants
63-2	06-10-63	Noise Interference
63-4	06-09-63	Chemistry - Boric Acid
67-4	05-10-67	Arc Strikes on Components
67-5	12-11-67	Site Safety Survey
68-1	02-07-68	Receiving Inspection for Valves
68-2	02-07-68	Concentrates Filter Spin Designation
68-4	02-20-68	Life Cycle of Annunciator Flasher
68-5	02-27-68	Air Operated Valves
68-7	03-05-69	Auxiliary Pump Hydrotesting
68-8	04-22-69	Auxiliary Piping Penetrations
6809	05-03-68	Buffalo Supplied Motors
68-11	05-07-68	Welding Saunders Valves
68-14	05-15-68	Lead Lag Circuit Theory
68-15	05-23-68	Prevention of Mixing of Services
68-16	06-19-68	Threaded Joints
68-19	06-27-68	Material Spec. G-569866, Rev. 4
68-20	07-18-68	Receiving Inspection Techniques
68-25	07-31-68	Mis-use of Vital bus
68-27	08-09-68	Return of Radiographs
68-29	08-20-68	Pre-Installation Checks
68-30	09-11-68	Foxboro Service Charges
68-33	11-08-68	Rod Control System (SCE, CYW, UEM, NOK, KEP)

Data Letters Index

NUMBER	DATE	SUBJECT
68-34	11-20-68	Hagan Service Charges
68-36	12-17-68	RTD's
68-37		Main Crane Hook
69-2	01-15-69	Installation of Coax and Triax Cables
69-3	01-28-69	Procedure for Powering Dana Amplifiers
69-4	01-28-69	Problems with Foxboro M-63S Alarm Unit
69-6	02-27-69	BF Relays
69-7	02-28-69	Temporary Marking of Plant Mtls.
69-11	04-01-69	Rod Control Motor Generator Sets
69-12	04-07-69	Connections for CRDM's and RPI's
69-15	05-08-69	Pump Vents & Drains-Valve Leakoffs
69-18	08-26-69	Motor-Operated Valves
69-20	09-02-69	Status Light Assemblies
69-22	09-12-69	Foxboro Return Materials
69-23	10-15-69	Placing of Electrical Equipment
69-24	10-27-69	In-core Instrument Guide Tubes
69-28	12-09-69	Hangers for Piping Systems
69-29	12-10-69	Safety Valves
70-2	01-30-70	Immersion Heater in Aux. Tanks
70-3	03-04-70	Vibration Problems with Reciprocating Pumps
70-5	03-20-70	Terminal Screws in BF Relays
70-12	05-13-70	Weights of Reactor Vessel Internals
70-15	06-29-70	Sealed Water - Filled Instruments
70-17	08-17-70	Radiation Monitoring Equipment
70-18	09-18-70	Triax Cable
70-20	10-02-70	Compression fittings for Instrument Line
70-23	12-09-70	Auto. Controlled-Torque Limited MOV

Data Letters Index

NUMBER	DATE	SUBJECT
70-24	12-09-70	Storage of Boron Concentration and Waste Evap.
71-1	01-04-71	Neutron Detector Thimbles
71-4	03-05-71	Steam Generator Handling Equipment
71-6	03-31-71	Unauthorized Disassembly of Valves
71-7	04-07-71	Installation of Helicoil Inserts
71-11	06-11-71	Acoustic Noise
71-12	06-06-71	Triax Connectors for I-C Flux Mapping
71-14	08-11-71	H.P. Connections for Primary Coolant Trans.
71-15	09-09-71	Contamination of Primary/Secondary Systems
71-19	10-21-71	BF Relay Racks
71-20	11-04-71	Barton Electronic Transmitters
71-21	12-17-72	Pressurizer Heater Insulation
72-1	01-10-72	Nuclear Steam Supply Pressure Recording Sys.
72-4		Selection of Hydro Test Pressure
72-5	04-21-72	Repair of Arc Strikes
72-7	09-13-72	CRDM Connectors
73-1	01-23-73	Mixed Bed Demineralizer Conditioning Procedure
73-2	02-06-73	Rod Drive MG Set
73-3	02-15-73	By-Pass RTD's
73-4	03-27-73	Control Rod Power Supply Voltage Regulators
73-5	07-10-73	Ground Fault Circuit Interrupters
73-6	07-16-73	Test Instrumentation Recommendations
73-7	08-08-73	W-2 Switch Modifications
73-8	08-13-73	Breakers for Safeguards Equipment
73-9	10-09-73	Digital RFI Data Cabinets
74-1	02-14-74	Pressurizer Relief Tank Safety Head
74-2	02-19-74	Reactor Trip Breaker Maintenance

NUMBER	DATE	SUBJECT
74-3	04-01-74	Calibration Procedure for Foxboro Transmitters with Cast Iron Covers
74-4	05-08-74	Calibration of Reactor Coolant RTD's
74-5	05-28-74	Standard NSSS Startup Equipment Recommendation
74-6	06-24-74	W-2 Switches - Cracked Discs
74-7	07-22-74	Torque Seating of MO Valves
74-8	07-30-74	Test Instrumentation Recommendations
75-1	02-12-75	Part-Length Rod Control PC Boards
75-2	09-26-75	Protection of Pressurizer Level Sensor
75-3	11-25-75	Drawing Reproduction Service
75-4	12-02-75	P-250 Computer XDS Card Repair
75-5	12-08-75	In-Core Flux Thimble Cleaning Procedure
75-6	12-11-75	Magnetic Rod Position System
75-7	12-23-75	Reactor Coolant Pump Motors
76-1	02-10-76	Recommended Frequency for Steam Generator Moisture
76-2	03-11-76	Torque Changes - R.C. Carryover
76-3	05-20-76	Analog (Magnetics) Rod Position Calibration
76-4	08-20-76	Test Instrumentation Recommendations
76-5	09-07-76	HV Power Supplies
76-6	10-01-76	Standard NSSS Startup Equipment Recommendations
76-7	10-15-76	Torque Values for Series "44,59, & Type D Steam Generator
76-8	11-09-76	RCS Chemistry Spec. Changes
77-1	01-05-77	Selection of Reactor Coolant System Hydrostatic Test Temperature
77-2	03-15-77	Test Equipment for NIS Excore Detectors
77-3	04-29-77	Solid St. Prot Syst. - Extender Boards
77-4	05-12-77	Flammable Fiber Board
77-5	06-08-77	Torque Valves for Pressurizers
77-6	08-03-77	Rod Control Snubber Capacitors

Data Letters Index

NUMBER	DATE	SUBJECT
77-7	09-01-77	Revision of 77-1
78-1	01-10-78	P250 Computer Rad Compressor
78-2	01-24-78	Standard NSSS Startup Equip.
78-3	02-20-78	Bottom Mounted Inst. Noise
78-4	03-21-78	Nuclear Instrumentation System Source Range Calibration
78-5	07-26-78	Solenoid Pilot Valves
78-6	08-03-78	Rod Position Indication Calibration
78-7	08-13-78	Heli-Coil Installation Procedure
78-8	08-19-78	Unauthorized Disassembly of NSSS Valves
78-9	09-02-78	NRC Reg. Guide 1.68 Rev. 2
78-10	10-12-78	Storage Moisture Control
78-11	11-22-78	R.C. Pump Motor Bearing Insulation
78-12	12-18-78	Rod Control Fuser
79-1	01-17-79	Changes to Stud Tensioners Procedure
79-2	01-17-79	The Use of Liquid Nitrogen on Cleves Inserts
79-3	01-21-79	Waste Gas Compressor Packages Rust Inhibitors
79-4	3-6-79	Solid State Protection Sytem
79-5	3-29-79	Pressurizer Heater Controller
79-6	07-24-79	RCS RTD Thermowells
79-7	10-01-79	Rod Control Wiring
80-1	01-17-80	Barton Model 763 Transmitter Cracked Lack Welds
80-2	02-14-80	R.C.P. Motor Leads
80-3	02-29-80	Nuclear Instrument Connectors
80-4	04-29-80	Test Instrument Recom.
80-5	05-16-80	RCP Alignment After Seal Mainten.
80-6	05-20-80	Return of WISD DC Cards
80-7	08-13-80	Foxboro Transmitter Junction Box

Data Letters Index

NUMBER	DATE	SUBJECT
80-8	08-28-80	Barton Transmitters
80-9	10-15-80	W Plant Process Computer
80-10	11-15-80	RCP Motor Maintenance Procedure
81-1	05-29-81	Guide Pin Modification
81-2	06-24-81	Instrumentation & Computer Invertor Transformer

Attachment 6

Salem

NSD DATA LETTER 74-2

From Nuclear Service Division
WIN 236-4744
Date February 19, 1974
Subject Reactor Trip Breaker Maintenance

NUCLEAR ENERGY SYSTEMS

TO: Distribution

Technical Bulletin NSD-TB-74-1 (issued 1/11/74) described a reactor trip breaker malfunction which occurred at H. B. Robinson station in December of 1973, and recommended certain additional periodic maintenance measures to improve the reliability of these breakers.

The malfunction (failure to trip during a regularly scheduled periodic test) was attributed to excessive friction in the linkage of the Undervoltage Trip Attachment, which is the device that initiates the breaker drop-open action by elevating the trip bar. The problem was corrected by cleaning and lightly lubricating certain portions of the linkage.

To preclude the possibility of reoccurrence of this malfunction, Westinghouse recommends that the reactor trip breakers be given regularly scheduled periodic inspection/maintenance as described in the Instruction Manual and in line with the following guidelines.

1. Scope. These recommendations are intended to apply to Westinghouse DB-50 (or DB-25) breakers in Reactor Trip applications. Some future WNES plants will be supplied with Westinghouse Type DS (stored energy) breakers, which should be maintained in accordance with their instruction manual.

2. Related Operations. It is expected that these inspection and maintenance measures would normally be carried out in conjunction with breaker periodic operational testing or during plant shutdowns. However, these recommendations in no way are intended to supersede breaker operational testing commitments and requirements.

3. Frequency. Intervals between maintenance will be influenced by operating and atmospheric conditions, but we would recommend that initially it be performed on a semi-annual basis. The period might then be extended to 9 or 12 months if experience shows this to be sufficient.

Attachment 1

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FORM 7504 U

4. Cleaning. Clean the entire unit by blowing with dry instrument air (or a hand bellows), followed by vacuum cleaning. Particular attention should be paid to the cleanness of the undervoltage trip device, which can be inspected without component disassembly.

5. Solvents. In general, the use of a cleaning solvent is not encouraged since some can be damaging to electrical components. If there is a particularly heavy deposit of contaminants, an inert or mild solvent such as Stoddard solvent could be used if applied sparingly.

6. Lubricants. Although the Instruction manual (page 5) cautions against any re-lubrication in the field, the manufacturers have agreed that the reliability of the breaker is improved by lightly lubricating the linkage of the undervoltage device occasionally. However, the lubricant should be applied only sparingly to the front and back faces of the vertical-traveling latch (interfacing with the flat copper-alloy spring).

   A dry or near-dry molybdenum disulfide lubricant should be used. Technical Bulletin NSD-TB-74-1 indicated Molykote G as a possible choice. That information is incorrect and is hereby rescinded. Molykote G uses a thickened mineral oil as a vehicle, which would tend to collect foreign material. A better choice would be Molykote M-88, or Spray-kote. Both are commercially available Dow Corning products.

7. Inspection. Following the above cleaning and lubrication the entire breaker should be operationally checked and inspected for broken parts, loose bolts or excessive wear.

This Data Letter and the above information supersedes Technical Bulletin NSD-TB-74-1, which is hereby cancelled.

W H Furfari

W. H. Furfari
Electric Technology
TECHNICAL OPERATIONS

S G Caslake

APPROVED: Sydney G. Caslake, Manager
Electric Technology
TECHNICAL OPERATIONS

WHF/nev
Attachment

Attachment 1

(See Data Letter 74-2)

Cancelled
2/19/74

NSD TECHNICAL BULLETIN

No.: NSD-TB-74-1
Date: 1/11/74

(An interim advisory notice of a recent significant technical development requiring immediate consideration by Westinghouse nuclear service personnel. Preliminary information only. Supplemental instructions and information, as appropriate, to follow through normal division and department procedures.)

Subject DB-50 Reactor Trip Breakers

System(s) Rod Control Power Supply S.O.(s) 385

Affected Plants All

References TO-E-530

Information:

An incident occurred recently at an operating plant where a reactor trip breaker failed to trip upon initiation of a normal trip signal. The incident occurred during the regularly scheduled periodic testing of the breakers.

Investigation revealed that excessive friction within the linkage of the Undervoltage Trip Device prevented this device from exerting sufficient force to initiate the breaker tripping mechanism.

The malfunctioning device was corrected by cleaning the entire breaker, and lubricating the faces of the vertical-traveling latch in the undervoltage device linkage. A molybdenum disulfide lubricant such as Molykote G is recommended.

The manufacturer is being asked to review the design of the UV devices to see if spring force could be increased to improve reliability.

In the meantime, all plant operators should be made aware of this potential malfunction.

Immediate Action: Parties responsible for plant maintenance should be reminded that these breakers require periodic mechanical maintenance. On a regular basis (perhaps semi-annually) they should receive maintenance as described in the Manual, plus blown-out, vacuumed, and UV device linkage lubricated as described above.

Follow-up instructions or information to be issued by NSD Electrical Technology (Responsible Dept) on or before 3/1/74 (Date)

Originator:

W H Furfari

W. H. Furfari
Electrical Technology
TECHNICAL OPERATIONS

Approval:

S. G. Caslake

S. G. Caslake, Manager
Electrical Technology
TECHNICAL OPERATIONS

Attachment 1

[

Outage Planning Manual

Volume II

Public Service Electric and Gas Company	PSE&G	Salem Generating Station Unit No. 1
Nuclear Service Division		Availability Improvement Department

Westinghouse Electric Corporation - Water Reactor Divisions - Pittsburgh, Pa.

Westinghouse Electric Corporation - Water Reactor Divisions - Pittsburgh, Pa.

SALEM UNIT NO. 1

OUTAGE PLANNING MANUAL

DISTRIBUTION LIST

Name	Title	Location	Manual Number
R. L. Foster	General Manager - Production Support	PSE&G Newark	1
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D. A. Ward	Station Planning Engineer	PSE&G Salem	4
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L. M. Fry	Operating Engineer	PSE&G Salem	7
E. A. Watjen	Site Services Manager	W Salem	8
C. D. Webb	Project Engineer - Eastern Region	W R&D Center - Pgh.	9
E. Gus Taylor	Manager - Outage Planning	W R&D Center - Pgh.	10
C. B. Dimmerling	Senior Engineer - Outage Planning	W R&D Center - Pgh.	11
File Copy (2)	Outage Planning	W R&D Center - Pgh.	12 & 13

Attachment 3

FOIA-86-790 C/3

AV57M/14M8110-54

Salem Unit #1 - Outage Planning Manual

Revision #1

The information listed below represents Revision 1 to the Outage Planning Manual. Please incorporate the information into your copy of the manual.

VOLUME #1

1. Remove Outage Manual jacket inserts and replace with new copies.

2. Remove title page and replace with new copy.

3. Remove original issue of Record Revision Sheet and insert new copy covering Revision 1.

4. Replace Distribution List with new list. This list was revised to reflect change in personnel assignments.

5. Replace Table of Contents with new copy. Table of Contents was restructured and additional sections and appendices were added.

6. Replace first page of Section 1 with new copy. This revision deleted reference to "PSE&G" and replaced with the word "utility" for purposes of standardization.

7. Replace complete Section 2. Major changes were made in this section to reflect not only changes in personnel assignments, but the latest information concerning the work to be accomplished during the upcoming outage.

8. Insert Figure 2.3 at end of section. This figure represents the tentative schedule for Refueling.

9. Replace the first page of Section 3. The second paragraph has been reworded.

10. Replace Section 3.3 with new copy. Section 3.4 and 3.5 were added at bottom of page.

11. Insert letters and meeting minutes directly after Section 3.5.

12. Insert new Section 4 - "Fuel Services and Reactor Core Data".

VOLUME #2

1. Remove Outage Manual jacket inserts and replace with new copies.

2. Remove title page and replace with new copy.

3. Remove original issue of Record Revision Sheet and insert new copy covering Revision 1.

4. Replace Distribution List with new list. This list was revised to reflect change in personnel assignments.

5. Replace Table of Contents with new copy. Table of Contents was restructured and additional sections and appendices were added.

6. Replace page beginning with Section 5.3.3. This page was revised to re-number section following 5.3.4.1 from 5.2.4.2 to 5.3.4.2.

7. Replace page beginning with Section 5.3.4.3. The paragraph under Section 5.3.5 was revised to change reference from "Section 6" to "Appendix C".

8. Replace page under 7.2 containing refueling exposure table. This table has been identified as Table #1.

9. Replace table under Section 7.3.1. This table has been re-numbered to "Table 2".

10. Replace existing Section 10 with the exception of organizational charts which should be inserted in Section 11, with new Section 10 entitled "Fuel Reactor Core Data".

11. Insert new Section 11. This Section is original Section 10, re-numbered for Section 11.

12. Insert after Appendix "C" tab, the instructions for reading the OMAR input.

13. Discard present information except Index under Appendix "E" and insert new data.

14. Insert new Appendices "G", "H" and "I".

OP-81-29

Westinghouse Electric Corporation — Water Reactor Divisions

Nuclear Service Division
Box 2728
Pittsburgh Pennsylvania 15230

C. Webb RVD

October 29, 1981

Mr. Don Ward,
Station Planning Engineer
Salem Generating Station
Public Service Electric & Gas Co.
Foot of Buttonwood Road
Hancocks Bridge, NJ 08038

Dear Don:

Attached for your information and use are the revised sections for volumes #1 and #2 of the Salem Unit 1 Outage Planning Manual. The revision includes comments to the original issue, input as a result of the pre-outage meeting and general revisions to correct typos and restructuring of the table of contents. In addition, we have provided the new Fuel Services and Reactor Core Data Sections 4 and 10, and Appendices "G", "H" and "I".

We have also included new cover inserts for both volumes. I would appreciate your comments and suggestions on the Manual.

Please update your manuals using the instructions provided. We have included copies for all members of your organization who hold controlled copies of the manual. Please make the internal PSE&G distribution for this revision.

Yours very truly,

E. G. Taylor

E. Gus Taylor, Manager
Outage Planning Programs

Encls.

cc: All holders of Outage Planning Manuals w/a

J. J. Leblang - wo/a
F. Noon - wo/a
J. C. Miller - wo/a

Attachment 4