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October 30, 1984

Division of Licensing
U.S. Nuclear Regulatory Commission
Attn: Steven A. Varga, Chief
Operating Reactors Branch No. 1
Division of Licensing
Washington, DC 20555

Reference: Beaver Valley Power Station, Unit No. 1
Docket No. 50-334, License No. DPR-66
Generic Letter 83-28, Items 4.2.1 and 4.2.2

Gentlemen:

Attached is the Beaver Valley Unit 1 response to your letter of September 13, 1984 requesting additional information on Generic Letter 83-28 Items 4.2.1 and 4.2.2

If you have any questions regarding this information, please contact my office.

Very truly yours,

J. J. Carey
Vice President
Nuclear Group

Attachment

cc: Mr. W. M. Troskoski, Resident Inspector
U.S. Nuclear Regulatory Commission
Beaver Valley Power Station
Shippingport, PA 15077

U.S. Nuclear Regulatory Commission
c/o Document Management Branch
Washington, DC 20555

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A055
1/1

Response to Request for Additional
Information Regarding Salem ATWS Event
Items 4.2.1 and 4.2.2

1.1 Information Request for Item 4.2.1

Included with the submittal is a copy of the Beaver Valley 1 Preventative Maintenance Procedure for the Reactor Trip Switchgear effective March 9, 1983, which is in substantial conformity with the Westinghouse recommendations. However, the submittal states that "when the WOG program is finalized, we will review the program and adopt the preventative maintenance recommendations determined necessary to maintain the reactor trip breakers." Do you intend to adopt the Owners Group program in total? If not, identify any exceptions that may be taken with respect to the Westinghouse recommendations for the maintenance of the breakers and provide appropriate justification.

Response:

The Westinghouse Owners Group Maintenance Program has been reviewed, and the pertinent inspections have been incorporated into the plant-specific preventive maintenance program. The following are the major exceptions:

A. The frequency of the preventive maintenance has remained at 18 months (refueling) instead of the semi-annual and refueling intervals recommended in the WOG program. This is based on acceptable performance and results from prior preventive maintenance, surveillance testing, and reactor trips.

B. Presently, no counters are installed on the breakers, as such, the PM program does not call out replacement of the UVTA at 1250 cycles. However, a design change has been initiated to investigate the possibility of adding counters.

Attached for your information is a copy of the preventive maintenance program for the 'A' reactor trip breaker, revised to incorporate the pertinent inspections of the WOG Maintenance Program.

In addition, a corrective maintenance procedure was developed for replacement of the UVTA based on the WOG maintenance program.

1.2 Criteria for Evaluating Compliance With Item 4.2.1

The Beaver Valley 1 Reactor Trip System utilizes Westinghouse DB-50 circuit breakers. The primary criteria identified for an acceptable maintenance program for this breaker is contained in the Westinghouse Maintenance Program for DB-50 Trip Switchgear. Specifically, the criteria used to evaluate compliance should include those items in the Westinghouse program that relate to the safety function of the breaker supplemented by these measures that must be taken to accumulate data for trending.

Response:

The pertinent items in the WOG program related to safety, specifically undervoltage trip attachment, shunt trip attachment, and lubrication, have been incorporated into the plant-specific program (Steps II.C, .D, .M, .Q, .T, and .U).

Data Sheets 1 and 2 are used to record parameters taken during the test and compare the values with their required values.

2.1 Information Request for Item 4.2.2

a. The submittal states that the breaker time response data along with other pertinent information will be used to forecast any possible degradation in the breaker operability. You should identify what other parameters such as trip force, dropout voltage and breaker insulation resistance will be used for this forecast.* You should also provide verification that the selection of parameters is sufficient to track all of the relevant factors that give indication of degradation of the breaker safety related function and that the breaker time response measurement includes the operating time of the under-voltage trip attachment.

*Four parameters have been identified as trendable and are included in the criteria for evaluation. These are (1) Under-voltage trip attachment dropout voltage, (2) trip force, (3) breaker response time for under-voltage trip, and (4) breaker insulation resistance.

Response:

The parameters trended for the reactor trip breakers at Beaver Valley 1 are:

- Response time for reactor trips from plant computer
- Response time for undervoltage trip attachment from breaker time response test
- Response time for shunt trip attachment from breaker time response test
- Undervoltage trip attachment dropout voltage from preventive maintenance

- Trip force from preventive maintenance
- Insulation resistance from preventive maintenance
- Contact pressure from preventive maintenance
- Contact resistance from preventive maintenance

This set of parameters is based on our reviews of vendor information along with operating experience.

In addition, data obtained from maintenance activities (i.e., parts replaced) is maintained for future reference.

The operating time of the undervoltage trip attachment (UVTA) and the shunt trip attachment (STA) for the reactor trip breakers is measured during the Technical Specification required time response testing (MSP 1.14). This test includes the time response for the UVTA alone, STA alone, and UVTA-STA together.

2.1 Information Request for Item 4.2.2

b. The submittal states that trend report results of the reactor trip breakers will be issued periodically to the plant's upper management staff and significant degradation found during breaker trending will be immediately identified for corrective action. Please provide a discussion of the technical criteria to be used for evaluating trend data. It should include a description of the use of acceptance limits, establishment of baseline values or other basis for identifying significant degradation of the breaker. It should also indicate the schedule or guideline for scheduling evaluation of the trend data.

Response:

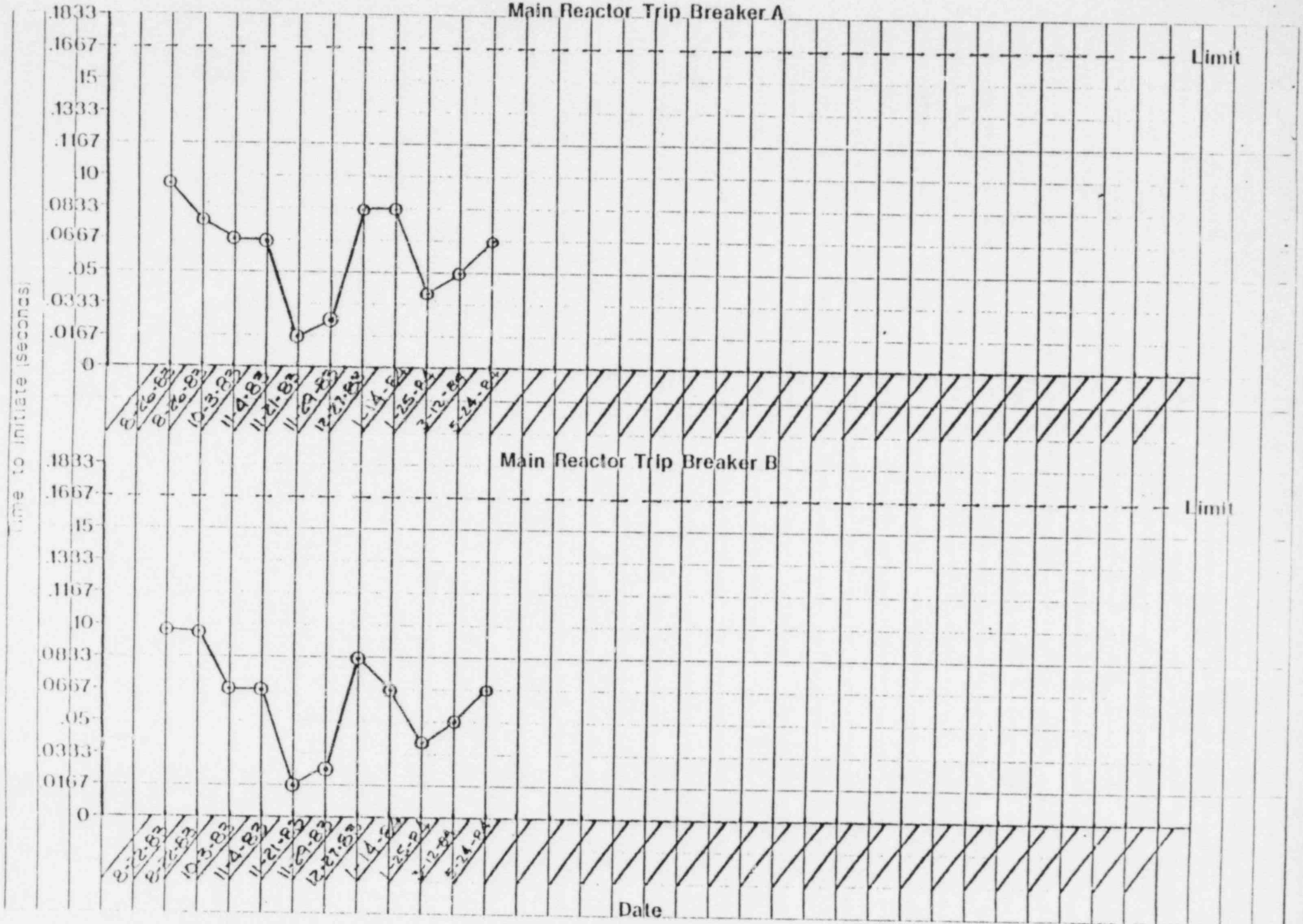
The technical criteria used to evaluate trend data are:

Parameter	Criteria
Time Response	≤0.167 seconds
UVTA Dropout Voltage	14.4 to 28.8 Volts
Trip Force	≤30 ounces
Insulation Resistance	≥2.0 megohms
Contact Pressure	0.050 to 0.093 inches
Contact Resistance	≤50 micro-ohms

These criteria are based on the WOG Maintenance Program, reviews of vendor information, and operating experience.

The data obtained from the various sources is compared to the acceptance criteria and plotted. If an unacceptable or questionable condition is identified, supervision is notified for a determination of appropriate corrective action. The parameters, except reactor trip times, have a tentative review schedule of 18 months, which is consistent with the frequency of the procedures which obtain the data. In addition to the trending review, all the procedure results are reviewed by a maintenance engineer upon completion.

The response time for reactor trips is reviewed on a monthly basis and reported to supervision in a monthly trend report. Attached is an example plot of trip breaker response time.


Main Reactor Trip Breaker A
Limit
Main Reactor Trip Breaker B
Limit
Time to initiate (seconds)
.1833
.1667
.15
.1333
.1167
.10
.0833
.0667
.05
.0333
.0167
0
8-26-83
8-26-83
10-3-83
11-4-83
11-21-83
11-29-83
12-21-83
1-14-84
1-25-84
2-12-84
2-24-84
Date

Data Sheet

DUQUESNE LIGHT COMPANY
Beaver Valley Power Station Unit No. 1

PREVENTIVE MAINTENANCE PROCEDURE

TITLE: RTA REACTOR TRIP SWITCHGEAR INSPECTION

PMP NO. 1-1RP-BK-RTA-1E

System Chapter No: 1	System Chapter Description: Reactor Control and Protection Sys.	Frequency: 18 Months
Equipment No: RTA	Equipment Description: Reactor Trip Breaker	

Task Description:

The Reactor Trip Switchgear will be inspected, tested and lubricated.

Outage or Operating Limits:

The Reactor Trip Breaker will be inspected when the reactor is shutdown and the rod drive motor generator breakers open. This procedure is to be performed in conjunction with PMP's 1-1RP-BK-RTB-1E, 1-1RP-BK-BYA-1E, 1-1RP-BK-BYB-1E, and MSP 1.14.

Special Material, Tools or Equipment Required:

Handtools, fine file, breaker closing handle, feeler gauges, vacuum cleaner, brush, Lubricant Ⓦ 53701GW, Safety Solvent stocked by DLC, 1000 V Megger, Ductor Test Set, Biddle Lubri-Tact Rheostat Catalog No. 411K50CS or variable 125 VDC power supply, 0-100 VDC Test Voltmeter, Closing Sequence Tester, 48 VDC power source with a capacity of at least 0.25 amperes, Spring-force scale or force gauge, 20 oz. weight +0 oz., - 4 oz.

Equipment Location	Elevation (Ft.): 715	Housekeeping Zone: IV
Building: Service Building		Cleanliness Class: D
Area: Switchgear Room		Category: I

DUQUESNE LIGHT COMPANY
Beaver Valley Power Station

APPROVAL SHEET - NONADMINISTRATIVE

PREVENTIVE MAINTENANCE PROCEDURE

1-1RP-BK-RTA-1E

RTA REACTOR TRIP SWITCHGEAR INSPECTION

Rev. No.	Pages Issued	OSC Review Date	Maintenance Supv. Review		Approval		Effective Date
			Initials	Date	Signature	Date	
1	1 thru 12	10/3/79	[illegible]	[illegible]	J A Werling	10/3/79	10/3/79
2	1 THRU 12	1/29/80	RLH	1/29/80	J A Werling	1/29/80	1/29/80
3	1 through 14	3/19/82	RLH	3/23/82	H P Williams	3/23/82	3/23/82
4	1 through 13	3/8/83	RLH	3/9/83	Wm S Lacey	3/4/83	3/9/83
5	1 through 29	5/3/84	RLH	5/4/84	Wm S Lacey	5/4/84	5/4/84
6	1 through 31	7/17/84	RLH	7/18/84	Wm S Lacey	7/19/84	7/20/84

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

I. PURPOSE

The purpose of this procedure is to inspect, lubricate and test the Reactor Trip Switchgear.

II. INSTRUCTIONS

NOTE: THE SECOND SIGN-OFF ON STEPS INVOLVING RETURNING VALVES, SWITCHES, WIRING AND/OR COMPONENTS TO THE NORMAL OPERATING CONDITION MUST BE SIGNED AND VERIFIED BY A KNOWLEDGEABLE PERSON OTHER THAN THE PERSON PERFORMING THE PROCEDURE STEP.

NOTE: THIS PROCEDURE INVOLVES THE USE OF SOLVENTS. REFER TO THE BVPS MAINTENANCE MANUAL, GENERAL WORK PRACTICES FOR FIRE PREVENTION TO OBTAIN A BREAKDOWN OF FLAMMABLE/NON-FLAMMABLE SOLVENTS AND CONTROLS REQUIRED FOR THE USE OF FLAMMABLE SOLVENTS.

NOTE: ADHERE TO THE REQUIREMENTS OF STATION ADMINISTRATIVE PROCEDURE, CHAPTER 18, WHEN USING CONSUMBABLE MATERIALS (E.G., LUBRICANTS, SOLVENTS, TAPES, ETC.) ON CATEGORY I EQUIPMENT.

NOTE: RECORD REPAIRED OR REPLACED PARTS INFORMATION ON DATA SHEET 2. OQC REQUIRED VERIFICATION OF REPAIRED OR REPLACED PARTS WILL BE DOCUMENTED ON DATA SHEET 2.

A. Sign on Equipment Clearance.

CAUTION: ENSURE THAT THE ROD CONTROL MOTOR GENERATORS ARE DEENERGIZED SUCH THAT NO POWER IS SUPPLIED TO THE ROD CONTROL SYSTEM.

B. Switchgear Enclosure Inspection.

1. Remove the breaker from the cubicle and place it in a suitable work location.

2. Inspect both the stationary and moveable portions of the main, as well as, secondary disconnecting devices for abnormal wear and overheating. Discoloration of the surface is not harmful unless corrosion due to atmospheric conditions is sufficiently severe as to leave deposits on the contact surfaces. Any deposits must be removed by rubbing with a clean cloth moistened with Stoddards Solvent, otherwise maintenance supervision must be notified that installation of new contacts is required.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

3. If required, remove excessive dust from buses, connections, supports and enclosure surfaces by wiping and vacuuming or blowing with electric blower.

4. Check buses, primary connections and supports for tightness of bolts.

5. Check tightness of all secondary wiring connections at the terminal blocks.

6. Inspect the positioning stop bracket and support rails for signs of mechanical damage and corrosion.

7. Check breaker support wheels for free movement.

8. Inspect cell interlock switches for distortion and free movement.

9. Record inspection results on Data Sheet 1.

C. Trip Force Check and Functional Test of Undervoltage Trip Device.

CAUTION: DO NOT PUT ANY MORE THAN 48 VDC ON THE TRIP DEVICE COIL AT ANY TIME DURING THIS PROCEDURE.

1. Connect a Biddle Lubri-Tact Rheostat, to a 125 VDC test source as shown in Figure 3, or connect a variable 125 VDC power supply (if available).

2. With the undervoltage device disconnected, adjust the variable resistor or variable power supply to obtain 48 VDC on the output.

3. Disconnect the 125 VDC test source if the Lubri-Tact Rheostat is being used.

4. Connect the test circuit to the breaker secondary contacts 11 & 12 (See Figure 3).

5. Reconnect the 125 VDC test source if the Lubri-Tact Rheostat is being used.

6. Readjust the variable resistor or power supply control slowly, if necessary, to obtain 48 VDC on the undervoltage coil.

7. Close the breaker manually.

8. Using a spring-force scale or a force gauge, pull or push up vertically on the trip bar (See Figure 5).

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

Record the force at the instant of breaker trip on Data Sheet 1.

9. Drop Out Voltage Test

   a. Close the breaker manually.

   b. Reduce the D.C. voltage slowly with the variable rheostat or power supply control until the breaker trips. Record the voltage at the time of breaker trip on Data Sheet 1.

   c. Reenergize the UV coil with 48 VDC and repeat steps II.C.9.a and b two times, recording dropout voltages on Data Sheet 1.

   d. Average the three dropout voltages and record the average on Data Sheet 1.

10. Load the trip bar (See Figure 5) with a weight of 20 oz., +0 oz., - 4 oz.

11. Apply 48 VDC to the undervoltage coil and manually close the breaker.

12. Deenergize the undervoltage coil and observe and record on Data Sheet 1 that the breaker trips.

13. Remove the weight and the test apparatus.

Weight and Test Apparatus REMOVED INITIAL_____

VERIFIED_____

D. Trip Bar Inspection

Raise and lower the trip bar by hand to assure that it does not bind (i.e., it should feel like a free weight). Record results on Data Sheet 1.

E. Arc Chutes.

1. Remove the three arc chutes (See Figure 1).

2. Examine the condition of the arc chutes. While a somewhat pitted, mottled and sooty appearance is normal, be alert for heavy erosion or broken plates. Damaged chutes should be replaced in the return to service section of this procedure. Record the condition of the arc chutes on Data Sheet 1.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

F. Retaining Ring Inspection.

Check that all retaining rings are securely in place on all visible shafts and pins as follows:

1. Moving Contact Hinge Pins (6, 2 per pole).
2. Stationary Arcing Contact Hinge Pins (6, 2 per pole).
3. Crossbar (2, one on each side).
4. Operating Mechanism (8, 5 left side).
5. Auxiliary Switch Linkage (3, 3 right side).
6. Pantograph (6, 3 top and 3 bottom).
7. Positioning and Interlock Lever (2).

All Retaining Rings Secure. INITIAL_____

G. Bolts.

Check all visible bolts and nuts for tightness.

H. Cleanliness.

If required, remove dust from the breaker parts with a vacuum cleaner and brush. Clean caked dirt from the breaker pins and slides with Safety Solvent.

I. Positioning Lever.

Check the spring loaded lever on the left side of the breaker for the following:

1. Lever is undistorted and moves freely.
2. Stop pin is undistorted.
3. Trip arm is undistorted.

Record inspection results or Data Sheet 1.

J. Pole Bases.

Inspect the physical condition of the pole bases checking for dirt or cracks. Clean as necessary. (The pole bases are the molded bases at the rear of the pole through which the breaker studs pass.) Record inspection on Data Sheet 1.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

K. Insulating Link (Refer to Figure 1).

Check the insulating link for cleanliness, chips, cracks and tightness of locknut. Clean as necessary. Record inspection results on Data Sheet 1.

L. Wiring.

Check the condition of insulation and terminations. Record inspection results on Data Sheet 1.

NOTE: REFER TO ATTACHMENT 1 FOR LUBRICATION PRECAUTIONS AND TECHNIQUES.

M. Lubrication.

1. Dispense drops of lubricant (Westinghouse Spec. 53701GW) liberally by placing the tip of the dispensing tube at the appropriate location and gently squeezing the container for the following points in the Undervoltage Trip Attachment (See Figure 6).

   a. Latch to latch spring.

   b. Latch loop to latch guide-pin.

   c. Latch to latch pin.

   d. Latch pivot.

   e. Latch pivot pin bearings.

   f. Pin running through the trip spring.

Record lubrication on Data Sheet 1.

2. Exercise the mechanism during and following lubricant application by blocking the breaker partially towards the closed position so that the UTVA reset lever is released. Exercise the device by manipulating the reset lever.

3. Breaker Mechanism Lubrication.

NOTE: IF A SOLVENT HAS NOT BEEN USED ON THE BREAKER AND THE BREAKER DOES NOT SHOW SIGNS OF SLUGGISHNESS OR FRICTION, STEP II.M.3 MAY BE OMITTED. INDICATE ON DATA SHEET 1. WHETHER LUBRICATION WAS APPLIED OR NOT.

CAUTION: NEVER USE LUBRICANT ON CURRENT CARRYING PARTS.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

a. Apply lubricant sparingly to all mechanism pins, bearing points and latch surfaces.

b. Tie back the adjustable reset lever on the undervoltage trip device.

c. Manually close and trip the breaker several times.

N. Operating Mechanism Test.

1. Tie back or check tied back the adjustable reset lever on the undervoltage trip device (Refer to Figure 2). This will allow the breaker to be closed without being automatically tripped by the undervoltage device.

CAUTION: KEEP HANDS AND TOOLS WELL AWAY FROM MOVING PARTS OF THE BREAKER TO AVOID PERSONAL INJURY OR EQUIPMENT DAMAGE.

2. Attach a Closing Sequence Tester or equivalent to each phase of the Circuit Breaker. The Tester will monitor the arcing contacts of the breaker. When the Tester lights are lit, the breaker arcing contacts are made.

3. Slowly close the breaker by exerting a slight closing pressure on the closing handle (See Figure 1) and simultaneously pushing forward on the breaker cross bar to start the breaker closing. Continue to slowly twist the breaker closing handle until one of the Tester lights are lit.

4. Continue to close the breaker and check visually to ensure that the arcing contact touches before the main contact in the same phase for each phase. Record this action on Data Sheet 1.

5. Push the push-to-trip button and ensure that the following occurs. Record on Data Sheet 1.

a. The toggle linkage should collapse and the moving contact assembly move freely to the full open position. This should be followed by complete resetting of the links in the toggle mechanism.

b. The links are free to move without friction or binding.

O. Arcing and Main Contacts.

1. Examine the condition of the arcing and main contacts check for roughness, spawling, galling or distortion. Some tarnishing is normal due to silver oxides and sulfides. Remove rough or high spots on the contacts

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

with a fine file or replace the contact if necessary. Record inspection results on Data Sheet 1.

NOTE: IN THE FOLLOWING STEP DO NOT OVERADJUST AS THIS WILL CAUSE THE CONTACT SPRINGS TO COMPRESS TO THE SOLID POSITION AND THUS INCREASE THE CLOSING EFFORT. CHECK FOR OVER ADJUSTMENT BY PRYING THE STATIONARY ARC TIPS OPEN TO AT LEAST 1/16 INCH GAP.

2. Close the breaker and check the contact pressure by measuring dimension "G" with feeler gages (Refer to Figure 1). The gap should be between 0.050 and 0.093 inches. Record the As Found gap on Data Sheet 1. If the gap is out of tolerance, adjust the gap by removing the crossbar and screwing the insulating link in or out on the stud. Tighten the lock nuts after each adjustment.

3. With the breaker closed measure the main contact resistance of each phase with a Ductor Test Set. Resistance should not exceed 50 micro-ohms. Record results on Data Sheet 1.

P. Control Relay.

1. Examine the contacts for wear and pitting. Replace the contacts if necessary (Refer to Figure 7).

2. Disconnect the closing coil leads from the control circuit wiring.

3. Energize the relay operating coil and slowly close the breaker manually. The relay release arm should operate the relay trip assembly and the relay trip assembly should open the relay contacts just before the breaker latches. This position can best be determined by watching the pawl in the breaker operating mechanism, which should snap in place just after the relay contacts open. Record results on Data Sheet 1. If this operation is not correct proceed as follows:

   a. Bend the relay release arm in the corrective direction.

   b. Make sure that the relay release arm does not rub on either side of the relay trip assembly lever aperture.

   c. When the breaker is latched, deenergizing and then energizing the relay operating coil should not cause the relay contacts to move toward the closed position.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

4. Deenergize the relay operating coil and remove the test apparatus.

5. Reconnect the closing coil leads to the control circuit wiring.

Closing Coil Leads RECONNECTED. INITIAL_____

VERIFIED_____

Q. Shunt Trip Attachment (See Figure 4).

1. With the breaker in the open position, manually push the moving core against the stationary core (Verify movement is free and nonbinding.) and rotate the breaker handle to the closed position. Verify on Data Sheet 1 that the breaker is trip free, i.e., the trip lever will raise the trip bar which prevents closing of the breaker.

NOTE: TRIP LEVER TO TRIP BAR CLEARANCE IS NONADJUSTABLE. IF THE VALUE MEASURED IS OUT OF TOLERANCE, VENDOR SERVICE IS REQUIRED.

2. Measure and record on Data Sheet 1 the clearance of the shunt trip lever to the trip bar.

3. Check tightness of shunt trip attachment mounting bolts.

4. Close the breaker manually.

5. Using the 125 VDC variable power supply apply 70 VDC to the shunt coil via the secondary contact terminals, (See Figure 9) and observe and record on Data Sheet 1 that the breaker trips.

6. Remove the test apparatus.

Test Apparatus REMOVED. INITIAL_____

VERIFIED_____

R. Auxiliary Switches.

1. Manually operate the breaker and check that contacts are touching well before the end of travel (See Figure 8). Record results on Data Sheet 1.

2. Inspect contacts for burning and pitting. Replace the contacts if necessary. Record inspection results on Data Sheet 1.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

S. Insulation Check.

1. With the breaker closed, megger from the primary disconnect on each phase to ground with a 1000 V Megger. Record results on Data Sheet 1.
2. With the breaker open, megger from the primary disconnect on each phase to ground with a 1000 V Megger. Record results on Data Sheet 1.

T. Under-Voltage Trip Attachment.

1. Manually close the breaker and check that trip lever to trip bar clearance is approximately 1/16 in with the breaker halfway closed.

CAUTION: BE SURE TO HOLD THE VERY END OF THE RESTRAINING LINE AND KEEP BOTH HANDS, AS WELL AS EQUIPMENT, AWAY FROM THE CROSSBAR WHICH WILL SNAP BACK AS THE BREAKER TRIPS.

2. Slowly release the temporary restraint allowing the UV attachment to perform the breaker trip function before the reset lever comes to rest. Visually monitor for smooth, unhesitant, positive, snap-action of the UV attachment and breaker trip.

Temporary Restraint REMOVED. INITIAL_____

VERIFIED_____

3. Post Lubrication Drop Out Voltage Test

CAUTION: DO NOT PUT ANY MORE THAN 48 VDC ON THE TRIP DEVICE COIL AT ANY TIME DURING THIS PROCEDURE.

a. Connect a Biddle Lubri-Tact Rheostat, to a 125 VDC test source as shown in Figure 3, or connect a variable 125 VDC power supply (if available).

b. With the undervoltage device disconnected, adjust the variable resistor or variable power supply to obtain 48 VDC on the output.

c. Disconnect the 125 VDC test source if the Lubri-Tact Rheostat is being used.

d. Connect the test circuit to the breaker secondary contacts 11 & 12 (See Figure 3).

e. Reconnect the 125 VDC test source if the Lubri-Tact Rheostat is being used.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

f. Readjust the variable resistor or power supply control slowly, if necessary, to obtain 48 VDC on the undervoltage coil.

g. Close the breaker manually.

h. Reduce the DC voltage slowly with the variable rheostat or power supply control until the breaker trips. Record the voltage at the time of breaker trip on Data Sheet 1.

i. Reenergize the UV coil with 48 VDC and repeat Steps II.T.3.g and h two times recording dropout voltages on Data Sheet 1.

j. Average the three dropout voltages and record the average on Data Sheet 1.

4. Remove the test apparatus.

Test Apparatus REMOVED. INITIAL_____

VERIFIED_____

U. Cell Interlocks Test and Return to Service

1. Reinstall the three arc chutes and covers.

2. Return the breaker to the cubicle.

3. Sign off Equipment Clearance on Log Only.

4. Have Operations rack the breaker into the TEST position and close it.

5. Release the position lever. The breaker will trip. Record trip on Data Sheet 1.

6. Have Operations rack the breaker partially toward the CONNECTED position.

7. Try closing the breaker between the TEST and CONNECTED positions; it should not close. Record results on Data Sheet 1.

8. Have Operations rack the breaker to the CONNECTED position.

9. Check the positioning lever stop pin for positive engagement with the third (rear most) slot of the positioning stop bracket. Also check for a visible

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

clearance (1/16" minimum) between the positioning lever trip arm and the breaker trip bar.

10. Have Operations close the breaker.

11. Depress the positioning interlock lever on the left side of the breaker. The closed breaker will trip. Record trip on Data Sheet 1.

12. Have Operations close the breaker and then trip it from the MCB switches for a total of 10 trips.

13. Sign off Equipment Clearance.

14. If PMPs 1-1RP-BK-RTB-1E, 1-1RP-BK-BYA-1E, and 1-1RP-BK-BYB-1E have been performed, notify Maintenance Supervision to have the Instrumentation and Control Department perform MSP 1.14. If the PMP's have not been performed, perform them at this time and then have MSP 1.14 performed.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

REFERENCES:

A. Duquesne Light Company Accident Prevention Manual.

B. Beaver Valley Power Station Operating Manual, Chapter 48.

C. Beaver Valley Power Station, Unit No. 1, FSAR.

D. Westinghouse Instruction Manual for Type DB-50 Air Circuit Breaker, I.B. 33-850-3D, Index File No. 1.11-235A.

E. Westinghouse, Nuclear Service Division, NSD Letter Data Letter 74-2. WIN: 236-4744.

F. Duquesne Light Company Electrical Test Procedure No. 5-4, Issue 0.

G. Wm. S. Lacey letter ND1SS1:0968 of Oct. 5, 1983.

H. Westinghouse Reactor Trip Switchgear Maintenance Program 1718D:4.

I. Westinghouse NSD Technical Bulletin 83-02, Rev. 1.

J. J.J. Carey to NRC, 11/4/83, response to Generic Letter 83-28 (ND1SLC:0813) items 3.1, 4.1 and 4.2.

K. Stone & Webster Dwg. No. 08700-RE-5K.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

PREVENTIVE MAINTENANCE PROCEDURE BRIEFING SHEET

I have read, understand and will follow Preventive Maintenance Procedure No. 1-1RP-BK-RTA-1E Revision No. 6
Titled RTA Reactor Trip Switchgear Inspection

SIGNATURE	DATE

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

DATA SHEET 1

PROC. STEP	ACTION	REQUIRED	INIT./ CHECK
B.	10. Switchgear Enclosure Inspection Results _____	Good	
C.	8. Force at Breaker Trip _____ oz.	≤ 31 oz.	
	9b. Voltage at which UV device operates _____ VDC	14.4-28.8 VDC	
	9c. Voltages at which UV device operates _____VDC _____VDC	14.4-28.8 VDC	
	9d. Average of three dropout voltages _____VDC	14.4-28.8 VDC	
	12. Trip Bar loaded and UV device deenergized	Breaker Tripped	
D.	Trip Bar	Non-Binding	
E.2	Arc Chute Inspection _____	Not Burned or Cracked	
I.	Positioning Lever Inspection _____	Lever, Stop pin and trip arm undistorted and lever moves freely.	
J.	Pole Base Inspection _____	Clean and Uncracked	
K.	Insulating Link Inspection _____	Clean, no cracks, no chips and locknut tight.	
L.	Wiring Inspection _____	Insulation in good condition and terminal connections tight.	

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

DATA SHEET 1 (continued)

PROC. STEP	ACTION	REQUIRED	INIT./ CHECK
M.	1. UVTA	Lubricated	
	3. Breaker Mechanism ___ Lubricated ___ Not Lubricated		
N.	4. Arcing Contacts Touch before the Main Contacts Phase A _____ Phase B _____ Phase C		
	5. a. Toggle Linkage Contact Assembly Toggle Mechansim Links	Collapsed Full Open Position Reset	
	b. Toggle Mechanism Links	Free to Move No Binding	
O.	1. Arcing Contacts Inspection _____ _____ _____	No Roughness, Spawling, Galling or Distortion	
	Main Contacts Inspection _____ _____ _____	No Roughness, Spawling, Galling or Distortion	
	2. Contact Pressure (Dimension G) Phase A _____ in. Phase B _____ in. Phase C _____ in.	0.050 - 0.093 in	
	3. Contact Resistance Phase A _____ micro-ohms Phase B _____ micro-ohms Phase C _____ micro-ohms	≤ 50 micro-ohms	
P.	Control Relay 3. Relay contacts open just before breaker latches	Open	

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

DATA SHEET 1 (continued)

PROC. STEP	ACTION	REQUIRED	INIT./ CHECK
Q.	Shunt Trip 1. Breaker is Trip Free	Trip Free	
	2. Trip lever clearance to trip bar _____ in.	1/32 to 1/8 inch	
	5. Breaker Trips with 70 VDC applied to shunt Coil	Breaker Tripped	
R.	1. Auxiliary Switches Contacts touch before the end of travel	Contact Made	
	2. Contact Inspection _____ _____ _____	Not Burned Or Pitted	
S.	Insulation Check 1. Breaker Closed: Phase A to Gnd _____ Megohms Phase B to Gnd _____ Megohms Phase C to Gnd _____ Megohms	≥ 2 Megohms	
	2. Breaker Open: Phase A to Gnd _____ Megohms Phase B to Gnd _____ Megohms Phase C to Gnd _____ Megohms	≥ 2 Megohms	
T.	2. Trip Lever to Trip Bar Clearance with Breaker halfway closed _____ in.	Approximately 1/16 in.	
	3h. Voltage at which UV device operates _____VDC	14.4-28.8 VDC	
	3i. Voltages at which UV device operates _____VDC _____VDC	14.4-28.8 VDC	
	3j. Average of three dropout voltage _____VDC	14.4-28.8 VDC	

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

DATA SHEET 1 (continued)

PROC. STEP	ACTION	REQUIRED	INIT./ CHECK
U.	5. Position Lever Released	Breaker Tripped	
	7. Breaker between TEST & CONNECTED	Breaker will not close	
	11. Positioning Interlock Lever Depressed	Breaker Tripped	
	12. Breaker tripped a total of 10 times from MCB swiches	Breaker Tripped 10 Times	

INSTRUMENTS USED	CONTROL NO.	HOLD DATE*

PERFORMED BY_____ DATE_____ TIME_____
Person In Charge of Work Party

APPROVED BY_____ DATE_____
Senior Electrical Maintenance Engineer

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

DATA SHEET 2

PART NAME	ITEM NO. FIGURE NO.	IDENTIFYING INFORMATION (STOCK #, SIR #, ETC.)	ACTION (REPLACED OR REPAIRED)	OQC

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

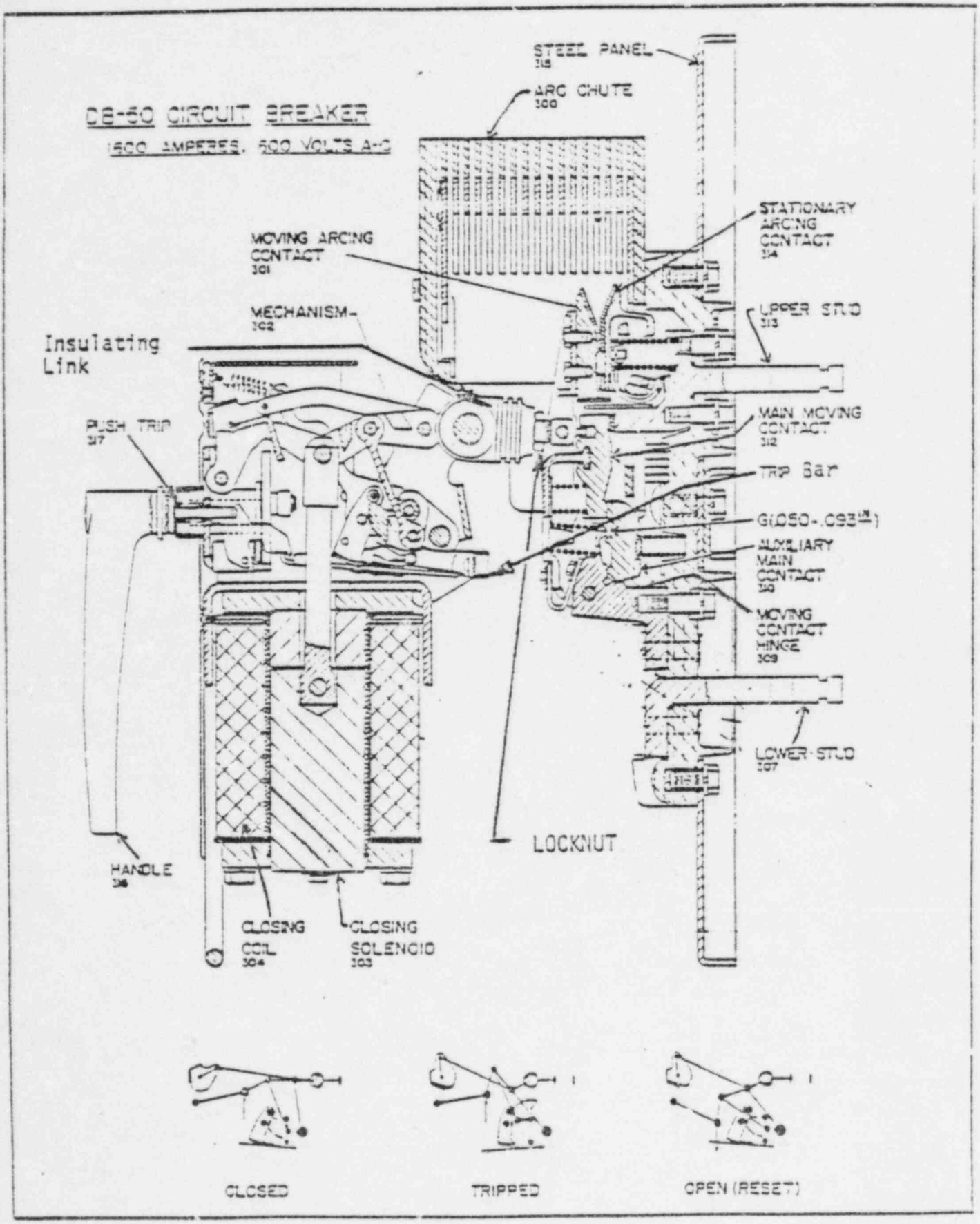
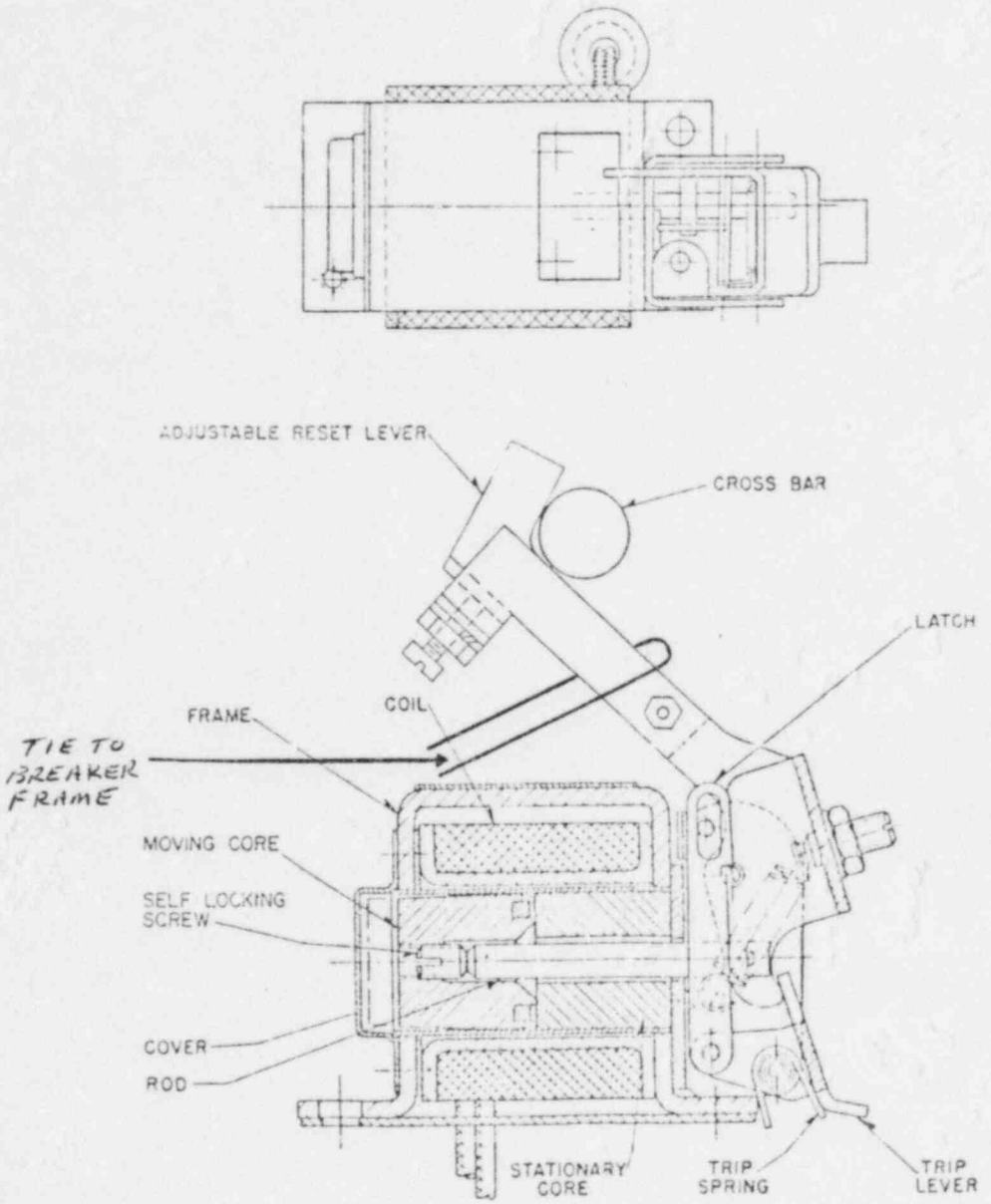
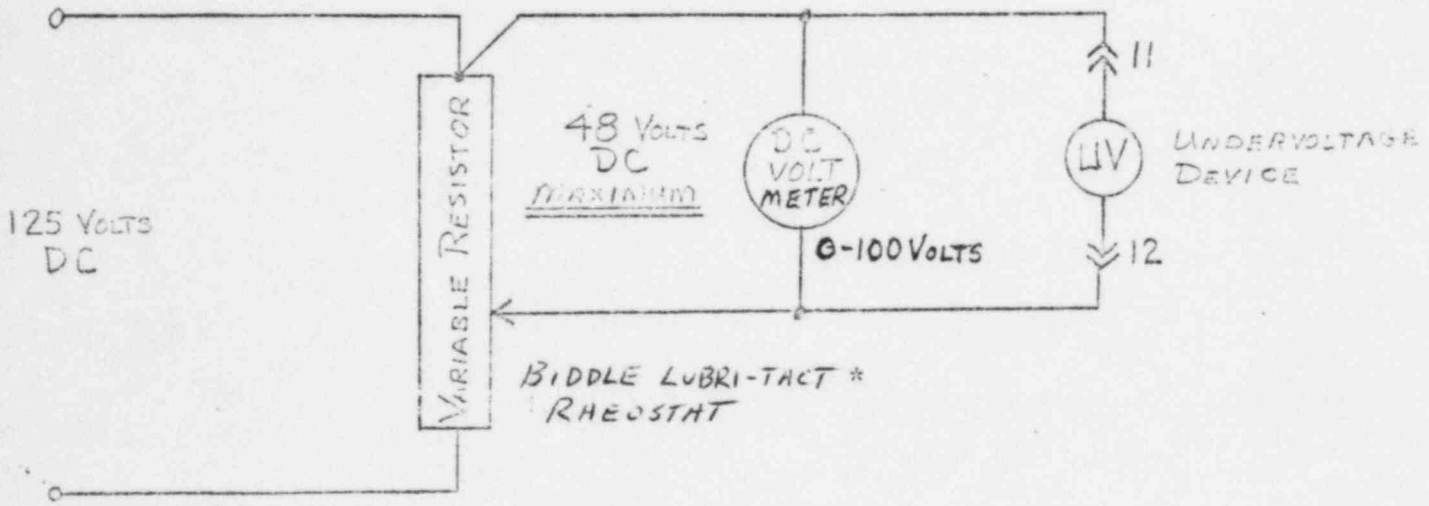


Fig. 1 Cross-Sectional View of Type DB-50 Circuit Breaker



- Undervoltage Trip Attachment - Construction Details

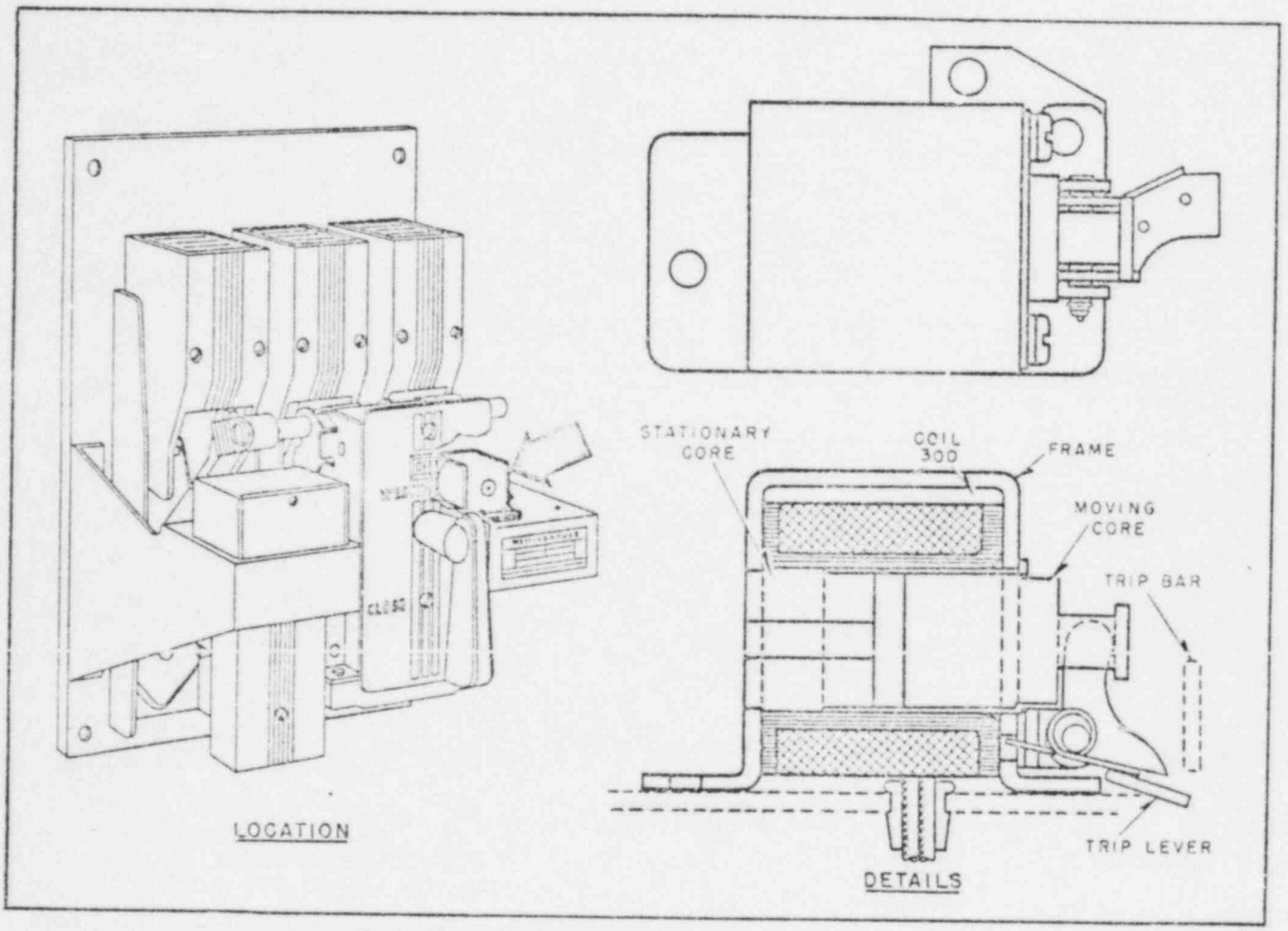
FIGURE 2



UNDERVOLTAGE TEST WIRING DIAGRAM

FIGURE 3

*A variable 125 VDC power supply may be used in place of the Rheostat, if available.



Shunt Trip Attachment - Location and Construction Details

FIGURE 4

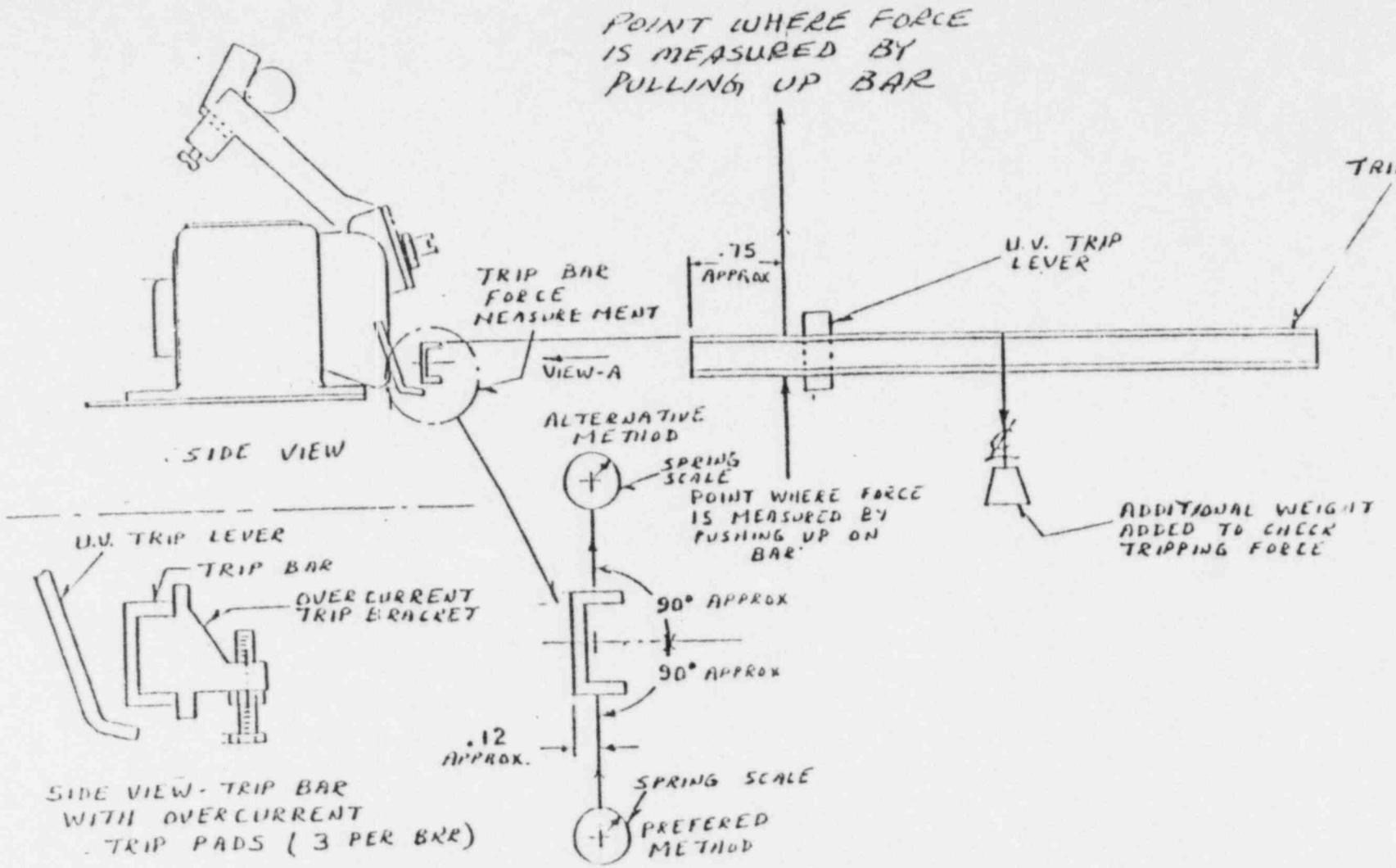

POINT WHERE FORCE IS MEASURED BY PULLING UP BAR
TRIP BAR
.75 APPROX
U.V. TRIP LEVER
TRIP BAR FORCE MEASUREMENT
VIEW-A
SIDE VIEW
ALTERNATIVE METHOD
SPRING SCALE
POINT WHERE FORCE IS MEASURED BY PUSHING UP ON BAR
ADDITIONAL WEIGHT ADDED TO CHECK TRIPPING FORCE
U.V. TRIP LEVER
TRIP BAR
OVER CURRENT TRIP BRACKET
90° APPROX
90° APPROX
.12 APPROX.
SPRING SCALE
PREFERED METHOD
SIDE VIEW - TRIP BAR WITH OVERCURRENT TRIP PADS (3 PER BKR)

FIGURE 5

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

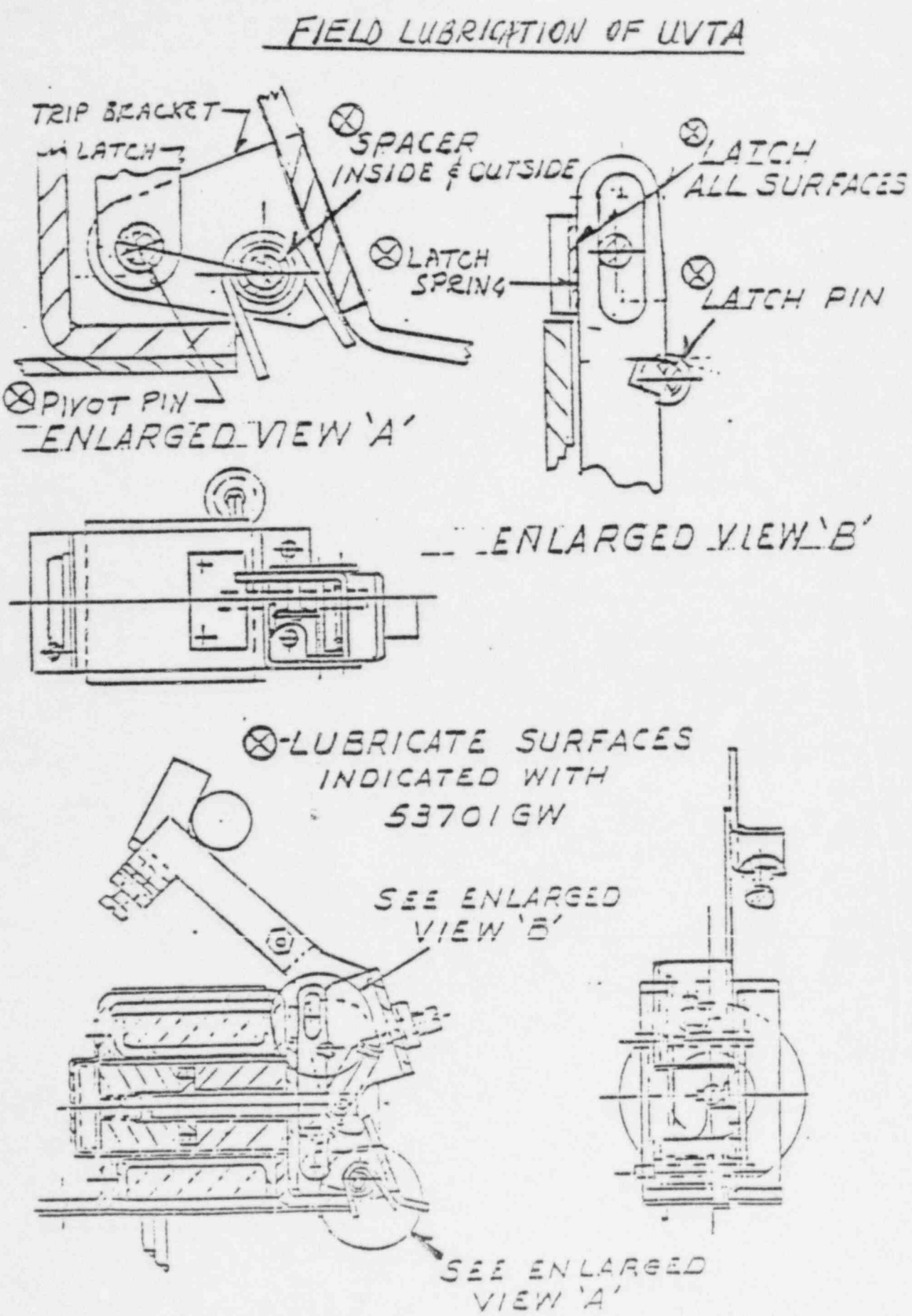
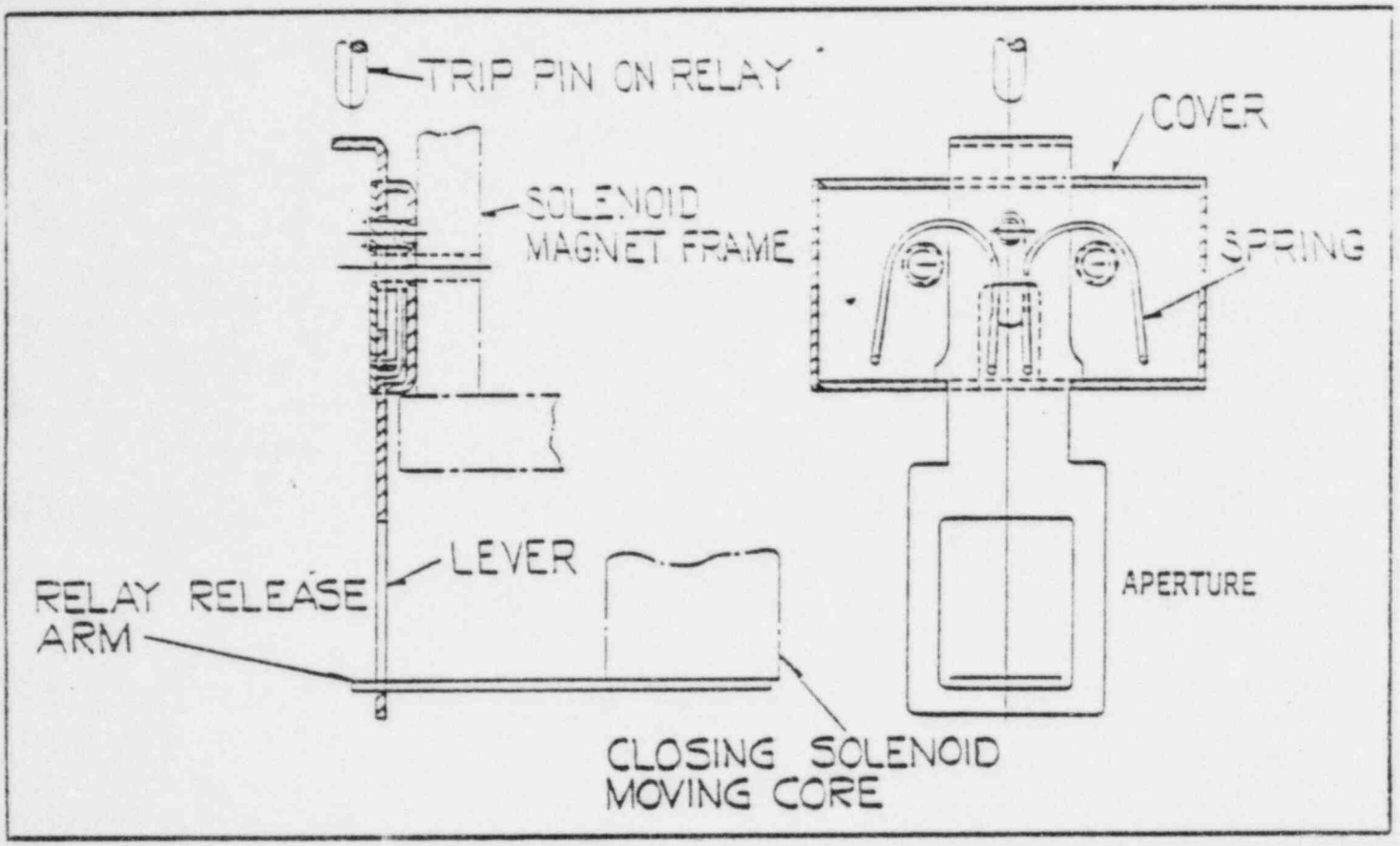
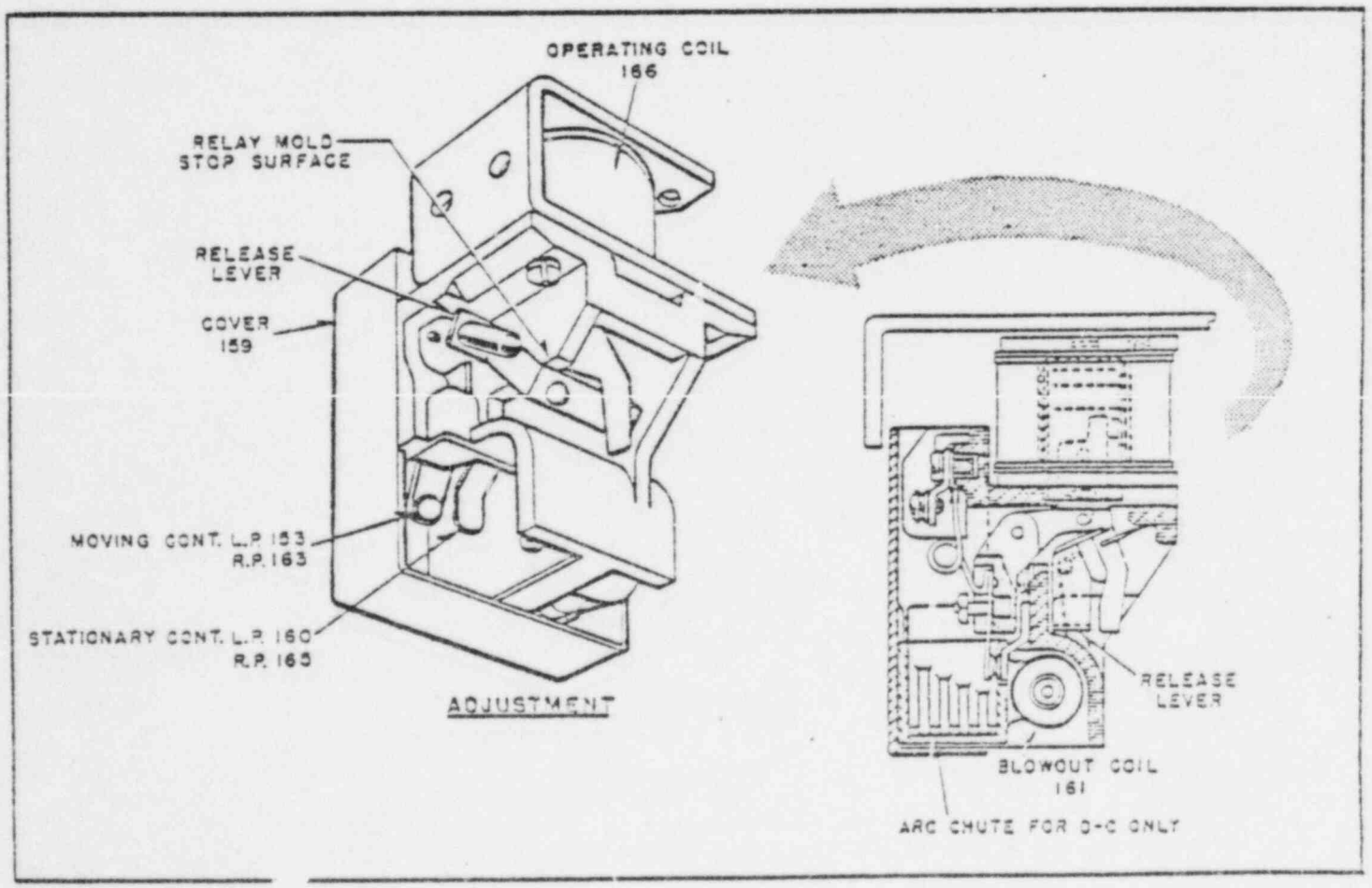


FIGURE 6

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

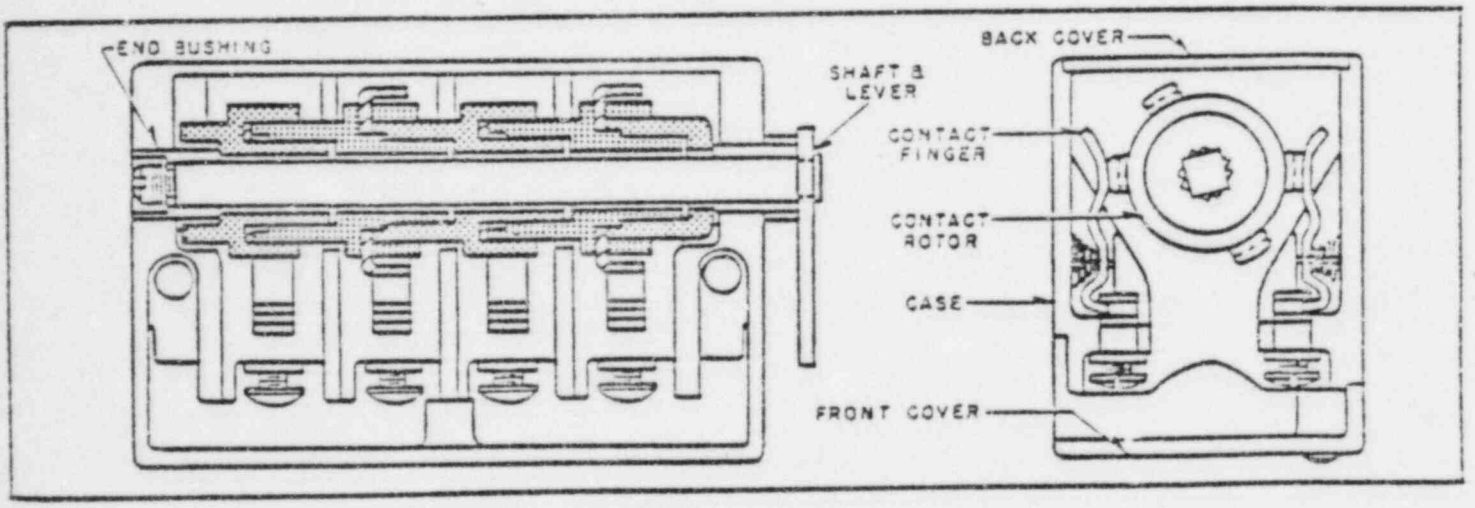




Control Relay - Adjustment and Construction Details

FIGURE 7

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)



Auxiliary Switch - Construction Details

FIGURE 8

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

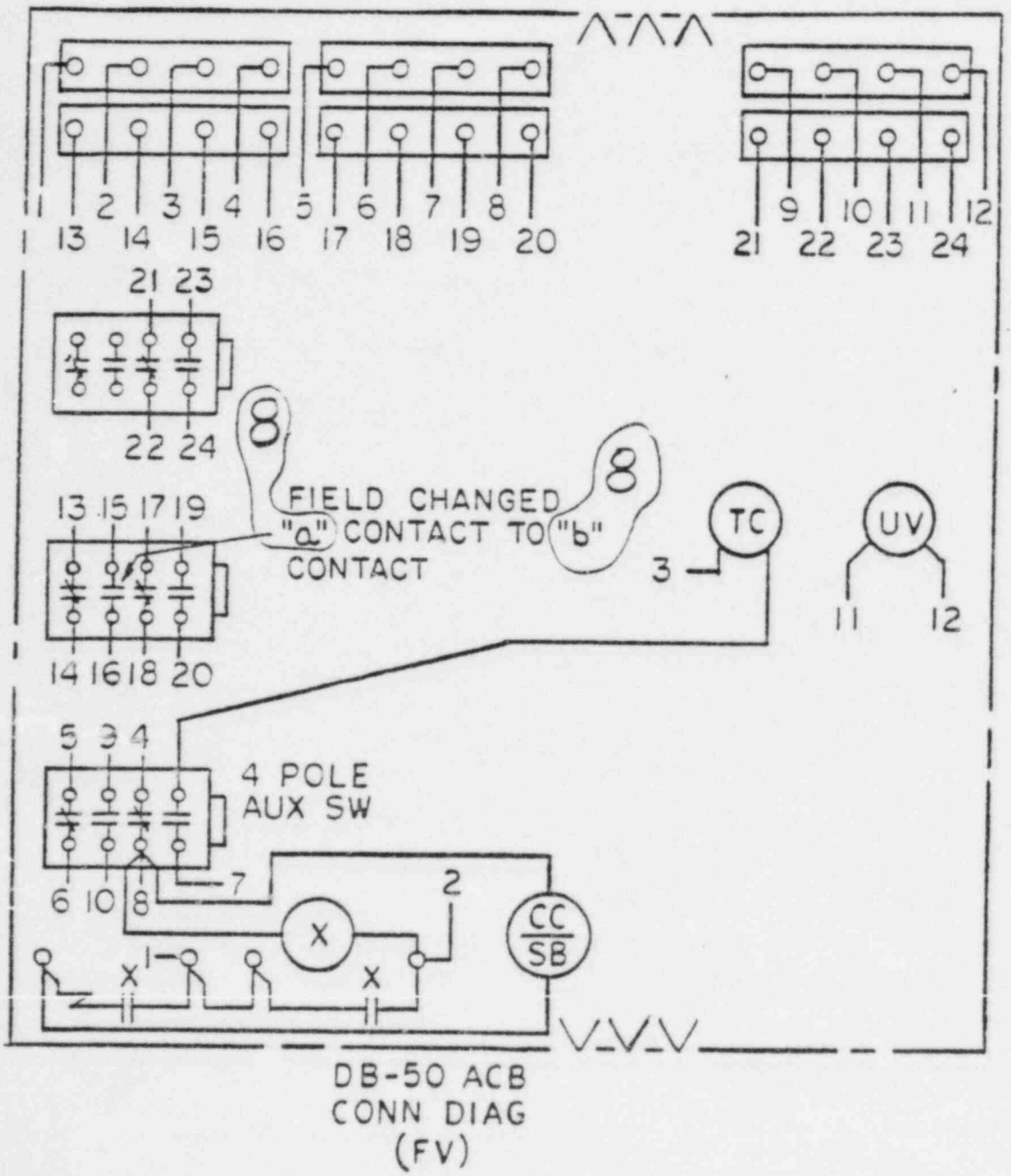


FIGURE 9

RTA REACTOR TR P SWITCHGEAR INSPECTION (continued)

ATTACHMENT 1

LUBRICATION PRECAUTIONS AND TECHNIQUES

1. The lubricant is to be dispensed with the chemists polyethylene "wash bottle" provided with the applicator kit. Lubricant handling and application techniques are further described in the Instruction Sheet accompanying the Application Kit.

2. The lubrication may be performed without removing the UVTA from its mounting. However, special care is required to reach all lubrication points by varying the direction of the application bottle dispensing tube.

3. Place a cloth beneath the UVTA while applying lubricant to collect over-shoot and run-off lubricant.

4. The lubrication mixture must be kept thoroughly mixed prior to and throughout the procedure by vigorously shaking the container occasionally.

5. The only UVTA lubricant approved by Westinghouse is a composition of a finely ground and purified natural ore of molybdenum disulfide and iso-propyl alcohol. It is prepared by mixing 5 parts by weight of this lubricating grade molybdenum disulfide with 3 parts by weight of commercial grade isopropyl alcohol. (Lubricant specified to Westinghouse Spec. 53701 GW.)

6. Application

   a. Thoroughly mix contents in glass container of lubricant by shaking vigorously for two minutes.

   b. Remove lubricant cap and attach the dispensing tube assembly. Tighten the tube assembly on the container. Pull gently on tube to make sure it is fully extended.

   c. Drops of lubricant are to be dispensed by placing the tip of the dispensing tube at the appropriate location and raising the lubricant container to the vertical position. It may be desirable to try out the dispenser to get a feel for the position required to dispense one drop.

   d. While using the lubricant, shake the container about every minute to keep the lubricant from settling out.

   e. If the contents have been left standing for longer than 5 minutes, it will require shaking for two minutes.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

ATTACHMENT 1 (continued)

7. After using the dispenser for lubrication, if the lubricant is to be stored overnight or longer, the following storage steps should be taken:

   a. Remove dispensing tube assembly from lubricant container and seal lubricant with original cap.

   b. Wipe excess lubricant from outside surface of dispensing tube with a clean towel or cloth.

   c. Attach dispensing tube assembly to top of carrier container.

   d. Invert carrier container to wash lubricant from dispensing tube. 12 to 15 drops of carrier should clean the tube. The carrier is flammable and should be dispensed into a suitable container used for storage of flammable waste solvents. Remove dispensing tube assembly and store the clean dispensing tube assembly for future use.

   e. Seal the carrier container with original cap.

8. If the tip of the dispensing tube assembly becomes clogged it can usually be cleaned by inserting a common pin into the tip opening to clear it. Repeat 7.c and d to wash clean.

RTA REACTOR TRIP SWITCHGEAR INSPECTION (continued)

SURVEILLANCE CRITIQUE

FREQUENCY 18 Months

CRITIQUE

PERFORMER OF TEST FOUND RESULTS SATISFACTORY WITH EXCEPTION OF THE FOLLOWING:

(a) PROBLEM FOUND _____

(b) CORRECTIVE ACTION TAKEN OR INITIATED _____

(c) MAINTENANCE WORK REQUEST NO. _____

WRITTEN AND FORWARDED TO:

_____INSTR _____MECH _____ELEC _____ENGR _____HP

(d) ESTIMATED DATE OF COMPLETION _____

Initiated by _____ DATE _____

TEST RESULTS FOUND:

_____ SATISFACTORY

_____ UNSATISFACTORY - RETEST SCHEDULED _____ DATE

_____ OTHER ACTION - DESCRIBE _____

_____ _____
RESPONSIBLE ENGINEER DATE