# FUEL OIL TANKS

# CATHODIC PROTECTION SYSTEMS

## 1. GENERAL

1.01 This appendix provides information for the testing of Cathodic Protection Systems.

1.02 It is reissued to:

- Revise the appendix title
- Delete information relating to Fuel Oil Analysis (This information is now located in the main section.)
- Update text and table.

*Note:* Marginal arrows used to designate changes are omitted.

## 2. DEFINITION

2.01 *Cathodic Protection:* A means of protecting fuel oil tank installations at microwave stations from destructive electrolysis, by raising the earth potential field around the tanks.

## 3. PROCEDURE

3.01 Record the normal rectifier output voltage and current monthly, preferably when a station visit is made. A record of the readings should be kept at the rectifier. Voltage and current changes of more than 20 per cent of normal should be investigated.

3.02 Annually test the fuel oil tank cathodic protection system in accordance with Section 171-199-902PT. Record results on Form P 2808 and file in Power Log Book under tab labeled ENGINE FUEL AND FUEL TANKS.

3.03 Drawing WA-21189, Schematic Circuit of Anode Terminal Box, should also be located at the rectifier showing any changes or additions made in the resistance network.

3.04 Refer to Table A for the troubleshooting guide.

3.05 Refer to Section 171-199-902PT for:

- The method of placing a new Electrolysis Protection System in operation.
- How to make routine maintenance tests.
- When to make reports.



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## TABLE A

## CATHODIC PROTECTION SYSTEM TROUBLESHOOTING GUIDE

| SYMPTOM | POSSIBLE TROUBLE |
|---|---|
| NO DC VOLTAGE OR CURRENT | AC FUSE IN RECTIFIER BLOWN.<br>DC FUSE BLOWN.<br>WALL SWITCH ABOVE RECTIFIER OPEN.<br>CIRCUIT BREAKER IN DISTRIBUTION CABINET OPEN.<br>RECTIFIER STACK SHORTED.<br>WIRING BURNED OPEN.<br>FILTER CAPACITOR CIRCUIT SHORTED.<br>FILTER CAPACITOR CIRCUIT OPEN.(SEE NOTE.)<br>METER SWITCH DAMAGED.<br>METER DAMAGED. |
| DC VOLTAGE BUT NO DC CURRENT | DC FUSE BLOWN.<br>SHUNT BURNED OPEN.<br>CURRENT SIDE OF METER BURNED OUT.<br>METER SWITCH DAMAGED.<br>FILTER CAPACITOR CIRCUIT OPEN. (SEE NOTE.) |
| DC CURRENT BUT NO DC VOLTAGE | VOLTMETER SIDE OF METER BURNED OUT.<br>METER SWITCH DAMAGED.<br>WIRING BURNED OPEN.<br>FILTER CAPACITOR CIRCUIT OPEN. (SEE NOTE.) |
| LOW DC VOLTAGE FOR NORMAL STEP | TROUBLE IN VOLTMETER.<br>ONE ELEMENT OF RECTIFIER STACK DEFECTIVE.<br>FILTER CAPACITOR CIRCUIT OPEN. (SEE NOTE.) |
| LOW DC OUTPUT CURRENT, DC OUTPUT VOLTAGE NORMAL | ONE OR MORE ANODE LEAD WIRES OPEN.<br>ONE OR MORE RESISTANCES IN ANODE TERMINAL BOX OPEN. |
| HIGH DC OUTPUT CURRENT, DC VOLTAGE NORMAL | ONE OR MORE PROTECTORS PERMANENTLY GROUNDED IN ANODE TERMINAL BOX. |

*Note:* The 1000 μd 50V capacitor is practically a short circuit to lightning surges and has been found very effective in preventing troubles developing in rectifiers. For this reason, an open in the capacitor circuit should be suspected in case any equipment is damaged due to lightning surges. The capacitor ***shall*** be replaced every 15 years even though no trouble ever develops with the capacitor.