

ORDER

DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GREAT LAKES REGION

GL 6970.16

10/29/73

SUBJ: BOILER MAINTENANCE

1. PURPOSE. This Order establishes minimum requirements for maintenance of central heating boilers and completion of related records.
2. DISTRIBUTION. This Order is distributed to the Airway Facilities Division, Branch level and above, to all Airway Facilities field offices, to the Air Traffic Division, Division level and above, and to all Airport Traffic Control Towers.
3. CANCELLATION. Order CE 6970.3A is cancelled.
4. APPLICATION. The schedules and records prescribed in this order apply to all FAA-owned and/or maintained hot water and steam boilers installed in the Great Lakes Region.
5. BACKGROUND. Handbook SM P 6970.3 contains general maintenance requirements on all types of heating systems. With the establishment of Agency-owned Centers and Towers, a need was created for a standardized boiler maintenance program with specific instructions, schedules and check sheets.
6. MAINTENANCE PROCEDURES.
 - a. Intermittently-fired boilers under 50 Bhp and their associated components shall receive daily, weekly and monthly servicing in accordance with GL Form 6970-2, "Great Lakes Region Daily, Weekly, and Monthly Boiler Maintenance Records" (see Appendix 1). At facilities where the boiler is not required for the cooling system, this servicing is required only during the normal heating season. The service schedules are the minimum requirements for an effective program of preventive maintenance.
 - b. Continuously-fired boilers and boilers 50 Bhp or larger and their associated components shall receive daily servicing in accordance with GL Form 6970-3, "Great Lakes Region Boiler Maintenance Record for Boilers 50 Bhp and Larger" (see Appendix 4), weekly and monthly servicing in accordance with GL Form 6970-2, and

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RAT-2; FAT-2 (Normal)

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quarterly and annual maintenance in accordance with GL Form 6970-4, "Great Lakes Region Quarterly and Annual Boiler Maintenance Records" (see Appendix 2). These schedules are considered to be the minimum number routines required for effective maintenance.

- c. Other equipment in the heating system such as room thermostats, pipe lines, fuel tanks, expansion tanks, etc., shall be serviced in accordance with the schedules set forth in Chapter 5 of Handbook SM P 6970.3. If not covered in the Handbook, servicing shall be in accordance with manufacturer's instruction.
- d. During the Building Engineer's non-duty days or absence, daily checks No. 3 and 4 on GL Form 6970-2 shall be performed by Electronic Technicians, or in their absence, by the Air Traffic Controllers. The Building Engineer shall give the Technicians and Controllers instructions on how to perform these checks and how to detect abnormal conditions. Water, temperature and pressure gages shall be marked with colored tape to indicate normal operating ranges.
- e. Corrective action shall be taken immediately to correct any deficiencies found during the routine maintenance checks. When an Air Traffic Controller discovers an abnormal condition, he shall notify the Airway Facilities personnel assigned to the facility, who, in turn, shall initiate prompt corrective action. If an obviously dangerous situation exists at the time of his check, the Controller shall shut down the boiler and then notify the maintenance personnel.

7. PERFORMANCE TESTS AND ADJUSTMENT PROGRAM.

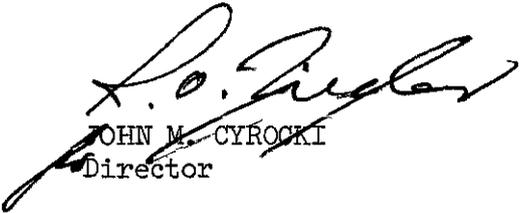
- a. An annual performance test and adjustment program shall be completed on all boilers. The work is to be performed by a qualified boiler serviceman or properly trained Agency Service Team using the appropriate testing equipment. Items to be checked and standards to be maintained are set forth in Appendix 3 to this Order.
- b. Boilers with dual fuel burners located at ARTC Centers shall be operated on oil at least once every three months for a minimum period of four hours. This is to insure that the boiler will operate properly on a gas failure or when a switch to oil is requested by the local gas company. Other boilers with dual fuel burners shall be operated on oil at least once during the heating season for a minimum period of four hours. No oil shall remain in a tank for a period exceeding three years.

8. MAINTENANCE RECORDS.

- a. Daily, weekly and monthly servicing and quarterly and annual servicing shall be recorded on GL Forms 6970-2, 6970-3, and 6970-4 as applicable. Maintain only one copy of each form. Personnel performing the main-

tenance shall enter their initials in the appropriate columns when the prescribed work has been accomplished. Results of the Annual Performance Tests and Adjustment Program shall be recorded on GL Form 6970-4.

- b. Completion of routine and corrective maintenance, plant failures and modifications shall be recorded in the facility's Plant and Structures Log Book, FAA Form 6030-1. Minute details of routine maintenance should not be recorded in this log. Rather, it is sufficient to enter a statement to the effect that the routines have been completed as prescribed in this Order. Other instructions regarding the maintenance of Form 6030-1 are contained in Order 6030.36A.
9. BOILER PLANT RECORD BOOK. A plant record book shall be maintained for each boiler. The function of the book is to provide a centralized binder of all records kept on the plant, other than Form 6030-1. Related directives may also be filed with the records. The book shall be an 11" x 8 $\frac{1}{2}$ " loose-leaf 3-ring binder titled, organized and maintained as follows:
- a. Cover Title. On the outside of the book print, "Record Book, _____ Bhp, _____ (make) _____ Boiler, Model No. _____, Installed at _____."
- b. Sections. Divide the book into labeled Sections and file the following records:
- (1) Equipment Data Section. List all pertinent data on the plant, including such items as date commissioned, part, serial and model numbers of major parts, supply sources, type of fuel oil, normal operating pressure, operating set-points of safety devices, etc.
 - (2) Modifications Section. File the plant's FAA Form 6032-1 in this Section. Also, copies of applicable modification directives may be filed in this Section.
 - (3) Maintenance Records Section. File completed copies of GL Forms 6970-2, 6970-3, and 6070-4, and write-ups on repairs and operation problems in this Section. Copies of Agency or manufacturer-issued directives, memorandums, bulletins, etc., on boiler plant maintenance may also be filed in this Section.


JOHN M. CYROCKI
Director

ORDER

**DEPARTMENT OF TRANSPORTATION
FEDERAL AVIATION ADMINISTRATION
GREAT LAKES REGION**

GL 6970.9

27 Mar 73

SUBJ: INSTRUCTIONS FOR CLEANING AIR CONDITIONING EQUIPMENT

1. PURPOSE. This Order provides instructions to field personnel for cleaning air conditioning equipment.
2. DISTRIBUTION. This Order is distributed to the Airway Facilities Division, Branch level and above, and to all Airway Facilities field offices.
3. CANCELLATION. This Order cancels Order CE 6970.6.
4. BACKGROUND. Technical inspections of air conditioning systems continue to reveal many maintenance items that are being overlooked. One prominent problem is the accumulation of dirt and other foreign material on various system components such as evaporator and condensing coils.
5. GENERAL. Evaporator and condenser coils consist of multi-row offset fin tubes which can be difficult to clean, especially when dust, dirt, lint, etc. collect on an area of the coil which is normally hidden from view. Once accumulation begins, further accumulation is progressive and coil efficiency is reduced.

Current maintenance procedures require the measurement of air temperature across evaporator and condenser coils at periodic intervals. This procedure will show a buildup on the coils when normal temperature drops start to decrease. (Example: Cooling and condensing coils are rated by the temperature drop of air passing through the coil at a given cooling load. This assumes a clean coil. As the coil accumulates dirt, etc., its heat transfer ability decreases since the accumulated dirt acts as insulation on the coil.) Therefore, when the temperature drop across a coil decreases, it is an indication that cleaning may be necessary.

6. CLEANING MATERIALS. The following materials which can be purchased locally are recommended for use in cleaning air conditioning equipment.
 - a. Sprayer, 3-1/2 to 4 gallon portable garden type
 - b. Metal cleaning detergents

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- (1) Calclean, Calgon Co.
- (2) Virginia Metal Cleaning Detergent, Virginia Co.
- (3) Vapco, all purpose heavy duty cleaner, Vapco Product Co.
- (4) Metalene, all purpose cleaner.

7. COILS. A proven method of cleaning coils is as follows:

a. Evaporator Finned Tube Coil.

- (1) De-energize the compressor and allow the evaporator fan to operate until the coils are completely dry.
- (2) De-energize the evaporator fan and blow all loose foreign material from the coils in a direction opposite to the normal air flow. This can be done with compressed high pressure nitrogen or carbon dioxide. Proper caution must be exercised when using these high pressure gases. A vacuum cleaner may also be used to dislodge debris.
- (3) Use a pressure type sprayer and thoroughly saturate the coils with a metal cleaning detergent mixed to the manufacturer's instructions.

b. Air Cooled Condenser Finned Tube Coil.

- (1) Disconnect power to compressor and condenser fan.
- (2) Clean, using step 2 and 3 for evaporator coils.

8. BLOWER FAN BLADES.

- a. Fan blades can be cleaned with a spray on metal cleaning detergent similar to that used on coils. After allowing the detergent to soak for 20 minutes, thoroughly rinse with clean water. It may be necessary to provide a means to let water drain from the fan housing. A small hole drilled in the lowest point of the fan housing will usually be adequate. This hole should be plugged with caulking compound or any suitable putty-like material before the fan is returned to service.
- b. Most fans and blowers should be scheduled for annual cleaning. However, if periodic inspections indicate that more frequent cleanings are necessary, the period between cleanings should be adjusted accordingly.

9. AIR HANDLING UNIT CABINETS. Air handling unit cabinets should be cleaned with a good metal cleaning detergent whenever the need arises. After a thorough cleaning, cabinets which show signs of paint deterioration should be repainted to match the existing color and texture.

10. FILTERS.

- a. Disposable Filters. Filters should be inspected monthly or more frequently where severe local conditions require more frequent inspections. Throwaway filters should be replaced where they are dirty.

Where filter gages are available, they should be used to indicate filter replacement. This is especially true where high efficiency, bag type filters are used.

- b. Re-useable Filters. Re-useable filters also need to be inspected on a periodic basis. When inspection shows that these filters are clogged, they should be removed from the system and washed with hot water. After the filter has been washed and thoroughly dried, it should be re-coated with the adhesive recommended by the manufacturer. This is usually a light oil especially used for filters. Lubricating oil should not be used for coating filters.

Alan H. Glass

ALAN H. GLASS

Chief, Airway Facilities Division