UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 1000
ARLINGTON, TEXAS 76011

54-362

29 AUG 1983

MEMORANDUM FOR: Les Constable, Senior Resident Inspector, Waterford 3

FROM: James A. F. Kelly, Chief, Physical Security Section

SUBJECT: 1982-83 WATERFORD-3 SALP REPORT

Enclosed is the input from the Physical Security Section for the 1982-83 Waterford-3 SALP report. If you have any questions, please contact me at 728-8130.

James A. F. Kelly, Chief
Physical Security Section

cc:
J. T. Collins
R. L. Bangart
J. E. Gagliardo
G. P. Brown
G. L. Madsen
W. A. Crossman

G. Physical Security

1. Analysis

To achieve the general performance objective, as stated in the regulations, the onsite physical protection system and security organization shall include, but not necessarily be limited to, the capabilities to meet the specific requirements related to the following elements:

a. Physical Security Organization
b. Physical Barriers
c. Access Requirements
d. Detection Aids
e. Communication Requirements
f. Testing and Maintenance
g. Response Capability

2. Protection Against Radiological Theft or Sabotage

a. This facility is currently in the preoperational stage and has received fuel which is in storage. Due to the continuing construction activities, all of the intrusion resistance, detection and assessment systems are not yet functional. Several areas of concern have been raised here. One major change was made in the main access control area since a design oversight was noted during inspection. A second concern, a design change from the original engineered sally port access area to another method, was a topic in a report. Some adjustments were made to the set up but it is still not constructed as originally designed. This may cause an approval problem later.

b. The matter of the trailer city location in relationship to the maintenance of the future protected area are a topic for consideration as the protected area barrier is being erected. Access control, surface leveling, isolation zones, and lighting are examples of potential problem items.

The protective apparatus for this site is essentially broken into three categories: (1) hardware/electronics applications; (2) plans and procedural guides; and (3) human resources to implement and operate the first two.

The latter two elements are evolving in a very positive way and the area of personnel development is exceptional.

However, there appears to be a link missing between the engineering and construction divisions and those human resources that will have to eventually comply with the plans and implement the procedures.

c. Several nonnuclear security incidents have occured during this construction stage. The handling of these matters effectively demonstrated the responsiveness and professional capabilities to resolve problems on the part of the corporate and site security organizations and their law enforcement counterparts. Some of these same incidents have demonstrated the need to maintain firmer administrative control over the licensees contractors.

3. Conclusions

The performance level associated with the development of the security organization is progressing in a positive and exceptional fashion.

While the overall acceptance testing of the hardware and electronics applications are a way off, there are indications that this may be problematic.

An effective and receptive line of communication exists between the licensees security representatives and the region's security inspection team. The involvement of management has been very good. Strong contributions of thought and time resources from the corporate and site management programs for two-thirds of the program are highly visible. The other third, hardware and electronics installation, does not provide the same reflection.

The licensee is considered to be in a performance Category 2 in this area.

4. Board Recommendations

a. Recommended NRC Action

The level of NRC inspection effort concerning physical barriers, detection aids, and the developing testing and maintenance programs should be greatly accelerated.

b. Recommended Licensee Action

Examine the avenues of communications between the management activities of those responsible for setting up the physical security systems and those who are to implement the total security program.

403479

NUCLEAR

HUDSON COOLING EQUIPMENT
INSTRUCTIONS AND SPARE PARTS MANUAL

HUDSON PRODUCTS CORPORATION
POST OFFICE BOX 36100
HOUSTON, TEXAS 77036 U.S.A.

OPA 5817--4340 R1 DATE REC'D 11/3/83

LOUISIANA POWER AND LIGHT
WATERFORD STEAM ELECTRIC STATION
1977 INST - UNIT NO. 3

P O GI 53-5817

MANUAL TITLE: HUDSON COOLING EQUIP. INSTRUCT AND SPARE PART MAN.

SPECIFIC DOCUMENT TITLE: I/M HUDSON COOLING EQUIP. INSTRUCTION AND SPARE PART MANUAL. (479)

VENDOR HUDSON PRODUCTS CO.

SHOP ORDER NO.

MANUAL NO. N0002/B-12

REVIEWED BY	DATE	ORIG DIV	REPLY NO.
KL	11/9/83	M	

REVIEW OF THIS DOCUMENT WITH OR WITHOUT COMMENTS IS ONLY FOR GENERAL CONFORMANCE WITH EBASCO PREPARED SPECIFICATIONS AND FOR CONFIRMATION OF PHYSICAL INTERFACE OF ITEMS SHOWN WITH RELATED SYSTEMS. SUCH REVIEW SHALL IN NO WAY RELIEVE CONTRACTOR FROM ENTIRE RESPONSIBILITY FOR ENGINEERING, DESIGN, WORKMANSHIP, MATERIAL, PERFORMANCE OF EQUIPMENT AND MATERIAL, AND ALL OTHER LIABILITY UNDER THE CONTRACT.

EBASCO SERVICES INCORPORATED
AGENT
2 WORLD TRADE CENTER, NEW YORK, NY 10048

EBS-0/7.80

11/9/83	ADDED 1 SEE ADD NOTE.

FOIA-84-206
M/53

ADD NOTE: BEFORE REINSTALLING PLUGS, THE MALE THREADS OF THE PLUGS SHALL BE CLEANED AND COATED WITH AN APPROVED THREAD LUBRICANT SUCH AS "NEOLUBE" OR "NEVER SEEZ PURE NICKEL SPECIAL N°165" TO PREVENT GALLING OF THE THREADS.

HUDSON PRODUCTS CORPORATION

SUBJECT: INTERNAL CLEANING OF TUBES

The internal cleaning of air cooler tubes uses the same me... shell and tube units.

These cleaning methods fall into three types:

1. MECHANICAL CLEANING: This consists of using drills, (or wire brushes), on long rods, and rotating the rods with air or electric motors. This type of cleaning is usually followed by water wash or air purge. This type of cleaning is not good for "Tarry" materials.

   The Elliot Company handles a complete line of these cleaners and will be glad to furnish recommendations on inquiry.

2. CHEMICAL CLEANING: This consists of circulating hot chemical solutions through the tubes. The solutions contain inhibitors to avoid corrosion of the tube walls.

   Among the companies specializing in this work are: Dowell, Halliburton, and the Oakite Company. They require a sample of the fouling material to determine the required chemical solutions to be used in cleaning.

   One and one-half inch to three inch inlet and outlet nozzles to each bundle are required for circulation of the solutions. They also require solution makeup tank and circulating pump. In some localities these companies have portable equipment on trucks.

   Chemical cleaning is increasing rapidly in process plant, as it saves downtown and disassembly of units. It will not work with plugged tubes.

3. HIGH PRESSURE WATER SPRAYS: The use of high pressure water sprays or "Hydro Jets" has been increasing in the United States and Europe in the past five years. In the United States; several service companies specialize in cleaning tubes with portable high pressure pumps mounted on trucks. Water capacity is usally 25 gpm with pump discharge pressures up to 9.000 psig.

   The high pressure water jet heads are placed on the ends of hollow rods, similar to mechanical cleaning, and pushed through the individual tubes. The correct water pressure to the jet is determined by trial. Usually, the softer the fouling deposit, the lower the required jet pressure.

   For instance, an amine cooler deposit can usually be cleaned at about 2000 psig. A water carbonate scale requires higher pressures in the range of 6000-9000 psig. Again, it should be stated that this process won't work on plugged tubes. They must be drilled out mechanically.

HUDSON PRODUCTS CORPORATION

CABLE-HUPCO-TELEX-775404-AREA CODE 713 785-4000

POST OFFICE BOX 35100
HOUSTON, TEXAS 77036

HUDSON COOLING EQUIPMENT

INSTRUCTION MANUAL

For Item: 1

EBASCO/LOUISIANA POWER & LIGHT COMPANY

HUDSON PRODUCTS CORPORATION

YOUR ORDER NO: NY-403479

HUDSON JOB NO: ND002

HUDSON PRODUCTS CORPORATION

CABLE: HUPCO · TELEX: 77-5404 · AREA CODE 713 785-4000

POST OFFICE BOX 36100
HOUSTON, TEXAS 77036

INSTRUCTION MANUAL FOR JOB ND002

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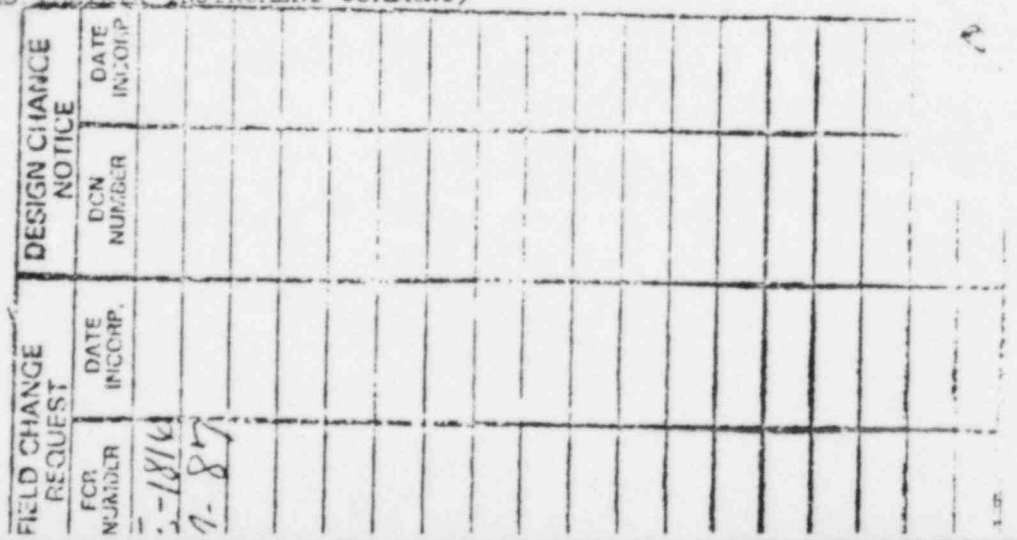


HUDSON PRODUCTS CORPORATION
CABLE HUPCO TELEX 775404 AREA CODE 713 785-4000
POST OFFICE BOX 36100
HOUSTON, TEXAS 77036

November 3, 1975

BULLETIN NO. B12

FIELD ENGINEER FOR PLANT START-UP OF
HUDSON AIR COOLED HEAT EXCHANGERS

Duties of the Field Engineer

The Field Engineer is an experienced mechanical technician who can ensure that Hudson FIN-FAN units are properly prepared for start-up and continuous plant operation. His responsibility is to instruct, advise and inspect, (not perform), the assembly operations prescribed in Hudson Installation Instructions. The Field Engineer's duties include:

1. Inspect for proper assembly, alignment, fit-up, and tightness of fasteners for structural parts, including columns and braces, fan housing, mechanical mounts, personnel guards, louvers, and walkways and ladders.
2. Before starting fan drives, check for proper assembly and alignment of all mechanical parts; inspect drive shaft bearings, couplings or speed reducers for lubrication; check fans for proper blade setting; confirm that vibration switches are mounted and connected, ready to energize; inspect V-belt drive for belt tension; and check all louvers, manually or automatically operated, from fully open to fully closed positions for freedom of movement, leaving in fully open position before starting fan.
3. Actuate fan drive and inspect for excessive noise, run-out, heating or vibration of any part, check motor loadings (it

may be necessary to reset blade angle by trial and error to required motor load), check for correct equipment rotation, check limit stop settings on AUTO-VARIABLE hubs, confirm sensitivity setting of vibration cut-out switch, and re-check louvers through full operational range, with fans on.

4. Check for removal of shipping clips between header and tube bundle frames, and confirm that piping does not restrict freedom of headers to float with process temperature changes.
5. Instruct plant operating personnel on installation and maintenance procedures, safety precautions, startup sequence (including the time that process fluid is introduced to the exchanger), and provide information on availability and stocking of spare parts.

Before Calling the Field Engineer

Since the function of the Field Engineer is to instruct, advise and inspect, it is important that the equipment be completely installed and ready to operate before his arrival. The following operations are to be completed prior to his arrival.

1. Install and assemble all items in accordance with Hudson Installation Instructions.
2. Install and approve electrical system, including vibration cut-out switch, (or applicable utility system if other than electric motor drive).
3. Fill all lubrication systems.
4. Align all mechanical equipment and bump (only) fan start switch for check of fan rotation (clockwise, facing air stream).

5. Install V-belts and tension correctly.
6. Install and check control equipment, including AUTO-VARIABLE hubs, louvers, steam coils, actuators, valve positioners. Connect all air operated equipment to supply lines and check for leaks.
7. Set fan blades at recommended pitch angle (see General Arrangement, or -11 drawings).
8. Install personnel guards and remove all construction equipment from the unit.

Calling the Field Engineer

The services of a Hudson Field Engineer are available for $260.00 per day (while absent from Houston, Texas), plus all transportation, for the contiguous United States, or $300.00 per day, plus transportation for foreign locations.

Notice before arrival date must be at least 7 days for U.S. locations; 14 days for foreign locations.

For information or notice, telephone:

713-785-4000
Extension 257

or telex: HUPCO 775404

or write: Hudson Products Corporation
Post Office Box 36100
Houston, Texas 77036
Attention: S. W. Henderson
or
C. W. Smith

SWH:ef
Revised 11-3-75

HUDSON PRODUCTS CORPORATION

START-UP AND SHUT DOWN INSTRUCTIONS

FOR

HUDSON FIN-FAN UNITS

Revised April 15, 1977
SWH:dc

START-UP INSTRUCTIONS FOR HUDSON FIN-FAN UNITS

I. MACHINERY

A. PRIOR TO RUN-IN

1. GENERAL

a. Check bearings for lubrication. Line from remote grease fittings should be loosened at the bearing end, then purged with grease from the fitting end. Reconnect remote line and insert grease until "froth" appears at seals. This procedure will insure that line and bearing is full.

b. Check fan blades to see that jackscrews are securely seated (15-20 ft.-lbs.), and that the fan blade retainer rings are seated properly. (Insert screwdriver blade between blade neck and retainer ring and twist to properly seat). The small #8-32 x 5/8" long, thread cutting screws inserted through the top and bottom of each blade cuff will assure proper location of snap rings.

c. Rotate fan by hand to see that fan shaft, and/or speed reducer, and driver turn freely.

d. Check for adequate fan blade tip clearance. The minimum allowable clearance is 1/8 inch unless otherwise specified. Maximum is 5/8 inch. To measure the minimum clearance, first move all blades past a fixed point on the inside of the fan ring to select the blade with the minimum clearance. Then move that blade through 360 degrees to locate the point of minimum and maximum clearance.

e. Energize the fan driver momentarily to check for proper direction of rotation and fan blade orientation. The leading edge of the fan blade is the thick edge. When properly pitched, this leading edge will be the lower edge.

f. If starting torque trips vibration switch, adjust sensitivity.

2. GEAR DRIVE UNITS

a. Check gear box for oil. Gears are shipped without oil, and must be filled in accordance with the manufacturer's recommendations prior to operation.

3. V-BELT DRIVE UNITS

a. Check V-belts for proper tension.

Revised April 15, 1977
SWH:dc

B. RUN-IN

1. GENERAL

a. Start fan driver and check driver as outlined in manufacturer's literature.

b. Check unit for excessive vibration.

2. GEAR DRIVE UNITS

a. Run fan for several hours; watch driver, gear, and bearings carefully during this period for abnormal heating or vibration. (Consult manufacturer's literature for maximum allowable start-up and operating temperatures). During this period check driver-output power and adjust fan blade pitch as necessary. Fan power will usually fall off during run-in period, necessitating an increase in fan pitch to load motor unless there is a large reduction in air temperature.

3. V-BELT DRIVE UNITS

a. Run fan for several hours; watch driver and bearings carefully for abnormal heating. (Consult manufacturer's literature for maximum allowable start-up and operating temperatures.) During this period check driver-output power and adjust fan blade pitch as necessary.

b. Tighten V-belts as required for proper tension (when properly tensioned there will be little or no "throwout" on slack side at motor).

II. TUBE BUNDLES

A. PRIOR TO INTRODUCING PROCESS FLUID

1. Remove temporary shipping clips (painted a bright yellow) that are welded to top and bottom of headers. (See Figure 1, Page 6.)

2. Remove all covers and tiedowns (if applicable).

B. INTRODUCTION OF PROCESS FLUID

1. All tube bundles have been hydrostatically tested to 150% of design pressure at the manufacturer's shops. To verify that no damage has been done during shipment and/or erection, it is good practice to hydrostatically test the entire system, including piping, heat exchangers, pumps, etc., prior to start-up.

2. In general, the start-up procedure should be conducted in a manner that will minimize thermal shock of the heat exchanger bundles, and will prevent over cooling of critical services during periods of low ambient temperature and low heat load.

3. Special precautions should be observed in starting up units for the removal of heat from process streams of the following types:

   a. High viscosity fluids.

   b. Fluids with pour points above the prevailing air temperature.

   In many cases the "Fin-Fan" units serving such streams will be specially equipped with one or more of the following devises to assist in the prevention of start-up and operating problems:

   a. Louvers
      (1) Hand operated
      (2) Automatic

   b. Panels

   c. Steam coils

   d. Automatic variable pitch fans

   e. Recirculation enclosure

   For units with these special devices, the start-up problems are considerably lessened. Prior to admitting the process fluid, close the louvers, start steam through the steam coils, and turn the fans off. Then slowly admit the process fluid until normal flow through the unit is obtained. Gradually open the louvers, stop the flow of heating steam, and start the automatic variable-pitch fans at zero-flow pitch. Watch the process fluid outlet temperature carefully during the period, and if the danger of excessive cooling seems likely, start the flow of heating steam. Generally, however, the outlet fluid temperature will still be well above design, and the process of gradual increase in heat removal can be continued. Gradually increase the flow of air until the desired process fluid outlet temperature is attained.

   For units without louvers, steam coils, etc., admit the process stream to the exchanger readily to prevent excessive cooling of the first liquid to reach the cold tubes. Care must be exercised, however, to prevent undue shock from a "hammering" effect. When normal flow is attained, start the fans at a reduced pitch; then gradually increase fan pitch until the desired fluid outlet temperature is reached.

4. For the removal of heat from process streams of low pour point and low viscosity, the start-up procedure for "Fin-Fan" units is somewhat simplified. First, admit the process fluid at a low rate, and gradually increase the flow to the design rate. Start the fans one at a time as the process fluid begins to exceed the design operating temperature. Finally, adjust the fan blade angle as required to attain design heat removal rate.

Revised April 15, 1977
SWH:dc

SHUT-DOWN INSTRUCTIONS FOR HUDSON "FIN-FAN" UNITS

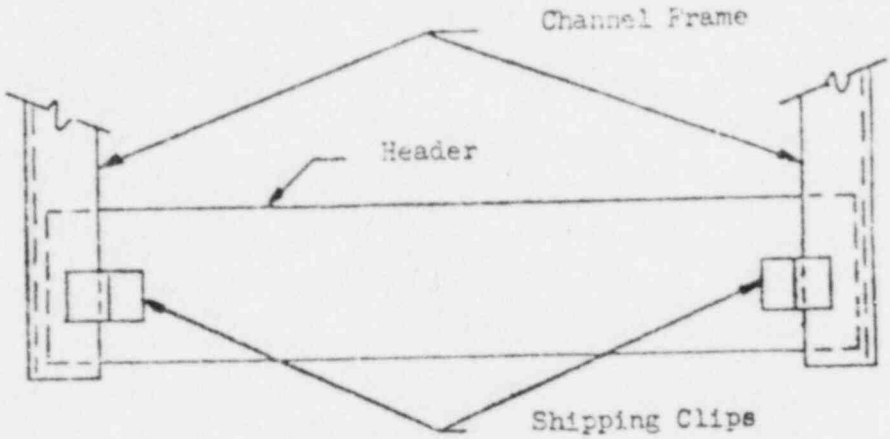
1. Turn off fans
2. Close inlet valves
3. Close outlet valves
4. Open all bundle drain valves
5. While bundle is still hot, apply air pressure to inlet header for several minutes or until all product has been forced from the bundle.

Extreme caution should be exercised when isolating bundles for winter operation during periods of low ambients.

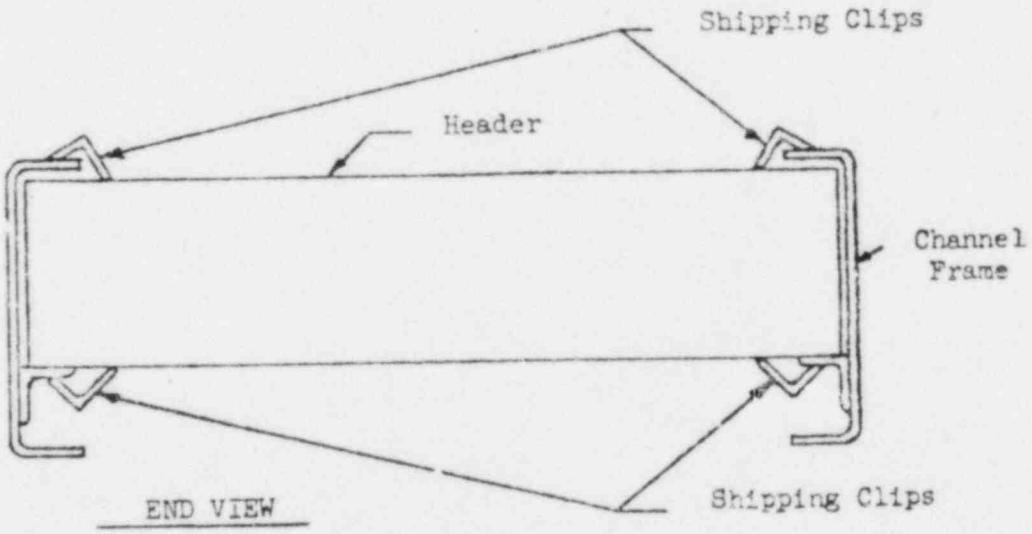
Revised April 15, 1977
SWH:dc

Figure 1

Shipping Clips



PLAN



END VIEW

UNIT RUN-IN PROCEDURE

Completely assemble units

1. Set fan pitch to recommended angle.
2. Check fan tip clearance.
3. Align and level sheaves.
4. Grease both fan shaft bearings.
5. Tension belts (proper tension will allow no run-out on slack side of belt when running.)
6. Make electrical hook-up.
7. Jump for rotation check of fan.
8. Allow fan to reach half-speed, turn off, allow to coast down while checking for unusual noises (blade sticking, motor noise, etc.)
9. If all is in order, start fan.
10. Check amperage, voltage and record same.
11. Allow to run thirty (30) minutes.

PROTECTION OF UNASSEMBLED PARTS FOR HUDSON FIN-FAN EQUIPMENT

1. Bearings
   a. All bearings must be kept in a dry, well ventilated storage area until units are ready for assembly.

2. Motors
   a. All motors must be stored in a dry, well ventilated area until ready for installation.
   b. Shafts must be rotated every thirty days.
   c. Keep machined surface of shaft covered with a heavy coating of grease.

3. Shafts
   a. All shafts must be adequately protected from corrosion and physical damage.
   b. Keep all machined surfaces covered with a heavy coating of grease.

4. Belts
   a. All belts must be stored in a dry, well ventilated area until ready for installation (preferably not more than 30 days prior to start-up).
   b. All belts are shipped in matched sets and must be segregated accordingly.

5. Sheaves
   a. Sheaves must be stored in a dry, well ventilated area with adequate corrosic protection for all machined surfaces. (We suggest an application of clear plastic or lacquer to all machined grooves.)

6. Gears
   a. All gears should be stored in a dry, well ventilated area until ready for installation.
   b. Gearboxes should be filled with lubricant to retard condensation and corrosion.
   c. Shafts should be rotated every 30 days.

7. Fan Blades
   a. All fan blades should be left in their containers until ready for assembly.
   b. All containers should be kept in an area where any physical damage can be avoided.

8. Fan Hubs
   a. Hubs should be left on their shipping pallets until ready for use.
   b. Hubs should be kept in an area where physical damage can be avoided.
   c. Adequate corrosion protection should be provided for all machined surfaces.
   d. Keep all machined surfaces covered with a heavy coating of grease.

9. Vibration Switches
   a. Switches must be kept in a dry, well ventilated area until ready for installation.

June 22, 1972

10. Tube Bundles
    a. Bundles should be stored in a leve position off the ground, with adequate protection from the elements, mud rain, etc.
    b. Tubes must be covered, preferably with plywood.
    c. All exposed nozzles must be covered.
    d. Care should be exercised to prevent any physical damage to the bundles.

11. Hoods
    a. Hoods should be stored in a mud-free area in a relatively level position (to prevent wracking).

    b. All shipping braces should be left intact until ready for assembly.
    c. Care should be exercised to avoid any physical damage to the sections.

12. Columns, Braces, etc.

    a. All structural members should be stored in an area where any physical damage can be avoided.

13. Hardware
    a. All nuts, bolts, lockwashers, etc. should be stored in a dry, well ventilated area until ready for use.

HUDSON PRODUCTS CORPORATION

STORAGE INSTRUCTIONS FOR ASSEMBLED UNITS

Units should be placed, preferably, over hard stand on wood shoring. If units are to be stored in open field, ground should be treated with herbicides to prevent growth of vegetation which may enter and foul finned tube surface. Shoring should be level so that unit is not placed in twisted attitude, thereby damaging the alignment of the mechanical equipment. For maximum protection of units 3/8" marine plywood may be placed over fan opening.

Special attention should be given to the following:

TUBE BUNDLES

1. For a storage period up to 45 days, bundles should be thoroughly drained and hard board covers taped over nozzle openings.

2. For storage periods longer than 45 days, carbon steel bundles should be thoroughly drained, nozzle openings sealed with ½" thick gasketed blinds and bundles purged and pressured with nitrogen to 5 PSIG. The exposed ends of carbon steel tubes between aluminum fins and tube sheets should be coated with epoxy to prevent external corrosion.

3. Stainless steel bundles should be hydrostatically tested with demineralized water, or tap water and flushed with chlorothane, or air tested to eliminate moisture inside. The bundles should then be sealed with ½" thick gasketed blinds and pressured as in Step 2.

MECHANICAL

1. During assembly in our shop remote grease lines will be filled, connected to bearings and bearings filled allowing surplus grease to accumulate in bearing cavaties for moisture-proofing. Light weight plastic sheeting will be taped tightly to the shaft just above the bearing to prevent accumulation of condensation or rainwater. The plastic sheeting will be taped in such a manner as to permit shaft rotation and should be left in place until equipment is placed in operation.

2. Motors will be wrapped with light plastic sheeting to prevent entry of rainwater into bearing and motor cavaties. Sheeting will be tightly taped to prevent removal by wind during transit yet loose enough to permit shaft rotation. The plastic cover should be left in place during storage and until unit is put in operation. If units are to be stored for more than 45 days, motors should be removed immediately and stored in a weatherproof area.

MECHANICAL

3. V-belts will be loosely installed at time of shipment and should remain so during storage period to prevent warpage of the shaft or setting of the belts. If units are to be stored for more than 45 days, belts should be removed immediately and stored in a weatherproof area.

4. If units are to be stored more than 45 days, sheaves should be protected preferably with a lacquer or plastic coating applied to the grooves to prevent corrosion. Exposed machine surfaces should be lightly coated with a rust preventative. If units have gear drives, gears should be filled with recommended lubricant to minimize interior corrosion.

INSPECTION AND MAINTENANCE DURING STORAGE

Motor shafts and fan shafts should be rotated several revolutions every thirty (30) days. This is to prevent pitting of bearings or bearing races which may occur when lubricant drains away from contacting parts.

STEPS TO BE TAKEN PRIOR TO STARTUP

1. After units are installed and prior to startup, expecially after extended period of storage, grease lines should be disconnected at bearings and old grease purged from lines. Lines should then be refilled, reconnected to bearings and old grease purged from bearing. Exhaust plugs should be removed from motor housings and new grease inserted until old contaminated grease is removed and new grease appears at exhaust port. Motors should be started and operated 5-10 minutes before exhaust plug is re-inserted. (Caution: Be sure exhaust plug is removed before inserting grease.)

2. The same prodedure of rotating motor shafts and fan shafts, practiced during storage, must be followed after installation and until units are put into operation.

JLG:maj(cr)
12-7-70

ADD NOTE: BEFORE REINSTALLING PLUGS, THE MALE THREADS OF THE PLUGS SHALL BE CLEANED AND COATED WITH AN APPROVED THREAD LUBRICANT SUCH AS "NEOLUBE" OR "NEVER SEEZ PURE NICKEL SPECIAL N°165" TO PREVENT GALLING OF THE THREADS.

HUDSON PRODUCTS CORPORATION

SUBJECT: INTERNAL CLEANING OF TUBES

The internal cleaning of air cooler tubes uses the same methods as [illegible] shell and tube units.

These cleaning methods fall into three types:

1. MECHANICAL CLEANING: This consists of using drills, (or wire brushes), on long rods, and rotating the rods with air or electric motors. This type of cleaning is usually followed by water wash or air purge. This type of cleaning is not good for "Tarry" materials.

   The Elliot Company handles a complete line of these cleaners and will be glad to furnish recommendations on inquiry.

2. CHEMICAL CLEANING: This consists of circulating hot chemical solutions through the tubes. The solutions contain inhibitors to avoid corrosion of the tube walls.

   Among the companies specializing in this work are: Dowell, Halliburton, and the Oakite Company. They require a sample of the fouling material to determine the required chemical solutions to be used in cleaning.

   One and one-half inch to three inch inlet and outlet nozzles to each bundle are required for circulation of the solutions. They also require solution makeup tank and circulating pump. In some localities these companies have portable equipment on trucks.

   Chemical cleaning is increasing rapidly in process plant, as it saves downtown and disassembly of units. It will not work with plugged tubes.

3. HIGH PRESSURE WATER JETTING: The use of high pressure water sprays or "Hydro Jets" has been increasing in the United States and Europe in the past five years. In the United States; several service companies specialize in cleaning tubes with portable high pressure pumps mounted on trucks. Water capacity is usally 25 gpm with pump discharge pressure up to 9.000 psig.

   The high pressure water jet heads are placed on the ends of hollow rods, similar to mechanical cleaning, and pushed through the individual tubes. The correct water pressure to the jet is determined by trial. Usually, the softer the fouling deposit, the lower the required jet pressure.

   For instance, an amine cooler deposit can usually be cleaned at about 2000 psig. A water carbonate scale requires higher pressures in the range of 6000-9000 psig. Again, it should be stated that this process won't work on plugged tubes. They must be drilled out mechanically.

HUDSON PRODUCTS CORPORATION

VOIDED by revision 1

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Among the service companies who specialize in "Hydro Jet" cleaning are:

Chemical Cleaning, Inc.,	New Orleans, Louisiana
Chemical Cleaning, Inc.,	Beaumont, Texas
Chmstede Machine Works,	La Porte, Texas
The Halliburton Company,	Duncan, Oklahoma, and nationally

There are, no doubt, other companies who furnish this service. The usual charge for this equipment is $35.00 per hour, which includes one operator and required other helpers.

We know of only one company who specializes in manufacturing these hydro-jets. Several of the service companies manufacture their own jets. The Arthur Products Company, 620 East Smith Road, Medina, Ohio, zip code 44256 manufactures hydro-jets under the trade name of "Jet Moles".

HUDSON PRODUCTS CORPORATION

SUBJECT: CLEANING FINS IN FIELD

Following are two cleaning procedures which have proven effective in several cases of cleaning fins. The first is intended for moderate cases and the second for severe cases, based on amount of fouling and tenacity of foreign substance.

I. Moderate Cases

A. Coils are cooled to 130°F max. prior to cleaning. (Cooling is necessary to allow slower drying of foam solutions to be applied.) Prior to cleaning, all motors and other equipment which may be damaged by chemicals or water should be protected.

B. Chemicals used are one gallon of DuBois Detergent C-1102 and one half gallon of DuBois Foam -- Add in 50 gallons of water. This gives a mildly alkaline solution which is applied to the coils using a DuBois Foam Gun. The foamed solution should be applied to the lower row from below and may also be applied to the upper row from above, if deemed necessary. After soaking 10-15 minutes, it is removed by a high volume rinse with plain water.

II. Severe Cases

A. Same as in previous case.

B. Chemicals used are two gallons of DuBois C-1102 and one half gallon of DuBois Foam -- Add in 50 gallons of water. This gives a mildly alkaline solution which is applied to the coils using a DuBois Foam Gun. The foamed solution should be applied to the lower row from below and may also be applied to the upper row from above, if deemed necessary. After soaking 10-15 minutes, it is removed by a high volume rinse with plain water.

C. Chemicals used are five gallons of DuBois Dynabrite (36% phosphoric acid) and one quart of DuBois Foam -- Add in 25 gallons of water. The foamed solution should be applied using a DuBois Foam Gun, and should be applied to both the bottom and top row if considered necessary. This should be allowed to soak 15-30 minutes, and may be timed by seeing when bright aluminum begins to show up on the lower fins. After soaking, it is removed by a high volume rinse with plain water.

Proper precautions should be taken to avoid the risk of harm to personnel by the acid solution.

D. Step C above may be repeated one or more times if required.

12-10-75

THE INSTRUCTIONS OUTLINED BELOW ARE LISTED IN THE PROPER SEQUENCE OF ERECTION. A GENERAL ARRANGEMENT DRAWING, SHOWING A COMPLETE UNIT WITH STRUCTURAL PARTS CLEARLY PIECE-MARKED FOR ERECTION PURPOSES AND MECHANICAL EQUIPMENT FULLY DESCRIBED AND LISTED BY ITEMS, WILL BE FURNISHED FOR EACH BATTERY OF UNITS. FOR UNITS WITH WALK-WAYS, AN ASSEMBLY DIAGRAM WILL BE FURNISHED TO SHOW LOCATION OF PARTS AND THEIR MARKINGS. A SUPPLEMENTARY MACHINERY ASSEMBLY DRAWING WILL BE SUPPLIED TO SHOW A DETAILED ARRANGEMENT OF THE MECHANICAL EQUIPMENT.

FOUNDATIONS

UNLESS OTHERWISE SPECIFIED FOUNDATIONS ARE TO BE FURNISHED BY THE PURCHASER. COLUMN PIERS ARE TO BE POURED TO ELEVATIONS, AND ANCHOR BOLTS ARE TO BE LOCATED IN ACCORDANCE WITH HUDSON PRODUCTS CORPORATION'S GENERAL ARRANGEMENT DRAWING. TOLERANCES ON ELEVATIONS AND ANCHOR BOLT LOCATIONS SHOULD BE CONSISTENT WITH GOOD PRACTICES TO FACILITATE ERECTION.

TUBE BUNDLES

INSTALL TUBE BUNDLE LIFTING ASSEMBLIES (2 SUPPLIED FOR ENTIRE JOB) AND BASE PLATE SPACER, AS SHOWN AND MARKED ON GENERAL ARRANGEMENT DRAWING TO TUBE BUNDLE FRAME. PLACE TUBE BUNDLE FRAME IN POSITION AND SHIM, IF NECESSARY, TO PROPER ELEVATION, AS DETERMINED BY A TRANSIT OR LEVEL. (A BOLT LIST IS PROVIDED ON THE "SUMMARY OF FIELD BOLTS AND ERECTION SEQUENCE", A PART OF THE "MECHANICAL PARTS LIST", SHOWING BOLT SIZES, WASHERS AND NUTS TO BE USED WITH EACH STRUCTURAL ASSEMBLY.)

MACHINERY ASSEMBLIES & FAN RING

MACHINERY ASSEMBLIES (SEE SHEET 1M1A) INCLUDING MACHINERY STRUCTURE, QUARTER FAN RINGS, MOTOR, GEAR, COUPLINGS, AND FAN HUB SHOULD BE PREASSEMBLED AT GROUND LEVEL AND INSTALLED AS A UNIT. MACHINERY SHOULD NOT BE ALIGNED UNTIL MACHINERY STRUCTURES ARE SECURELY BOLTED TO HOODS.

MACHINERY

INSTALL FAN HUB ON GEAR OUTPUT SHAFT WITH TOP OF HUB FLUSH WITH TOP OF GEAR SHAFT AND MAKE UP SET SCREWS OR FAN HUB CLAMPS. FAN HUB TAPERED BUSHING CAP SCREWS MUST BE TIGHTENED EVENLY TO ASSURE TRUE SEAT OF BUSHING. IT IS NECESSARY TO TIGHTEN (IN ROTATING SEQUENCE) EACH CAP SCREW APPROXIMATELY 3 TIMES TO OBTAIN A TIGHT FIT OF FAN HUB TO FAN SHAFT. (IF UNIT IS EQUIPPED WITH AUTO-VARIABLE HUB, SEE SPECIAL FAN INSTRUCTIONS FOR INSTALLATION DETAILS.)

CENTER GEAR OUTPUT SHAFT WITH FAN RING, SHIM AS NECESSARY TO LEVEL, AND SECURELY BOLT TO MACHINERY STRUCTURE.

ALIGN MOTOR BY ATTACHING AN INDICATOR TO GEAR FLANGE OF COUPLING AND SWING INDICATING MOTOR SHAFT, SIMULTANEOUSLY INDICATING BETWEEN FACES OF MOTOR AND GEAR COUPLING FLANGES. (SEE ILLUSTRATION NO. 5) SHIM AND ADJUST MOTOR AS NECESSARY TO BRING MOTOR SHAFT TO PROPER ALIGNMENT WITH GEAR SHAFT AND SECURELY BOLT TO MACHINERY STRUCTURE. NOTE: LIGHT TAP FIT OF MOTOR HALF OF COUPLING WILL FACILITATE ALIGNMENT PROCEDURE. PARALLEL AND RADIAL MISALIGNMENT SHOULD EACH BE HELD TO A MAXIMUM OF .002". (INDICATED READINGS SHOULD BE TAKEN AT NOT LESS THAN 4 POINTS ABOUT SHAFT AND COUPLING.) MOTOR AND GEAR MUST BE DOWELED TO MACHINERY STRUCTURE AFTER ALIGNMENT IS COMPLETED (2 DOWEL PINS EACH). MAKE CERTAIN THAT ALL KEYS ARE INSTALLED IN SHAFTS AND SET SCREWS ARE TIGHTENED. (ALL MACHINERY BOLTS MUST HAVE LOCK WASHERS.)

INSTALL FAN BLADES BEFORE FIELD WELDING FAN RING AND MACHINERY ASSEMBLY TO EMBEDDED ANGLE AND IN ACCORDANCE WITH SPECIAL INSTRUCTIONS. FAN PITCH SETTING IS SHOWN ON GENERAL ARRANGEMENT DRAWING.

AIR SEALS

SHEET METAL AIR SEAL STRIPS SHOULD BE INSTALLED BETWEEN ADJACENT TUBE BUNDLE FRAMES. SECURE AIR SEAL STRIP BETWEEN BOTTOM SIDE OF FLANGES WITH 3/4" x 1-1/2" GALVANIZED BOLTS AND LOCK WASHERS. SHEET METAL CORNER SEALS SHOULD BE ATTACHED TO SEAL OFF CORNER OPENINGS.

CAUTION: GEAR BOXES ARE SHIPPED WITHOUT OIL AND MUST BE FILLED WITH PROPER LUBRICANT BEFORE OPERATING. SEE MANUFACTURER'S INFORMATION FOR THEIR RECOMMENDATIONS.

Revised 03-03-77 FVH:mcj

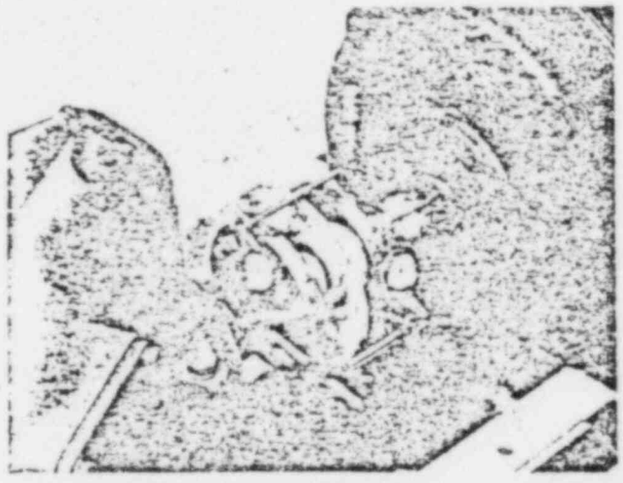
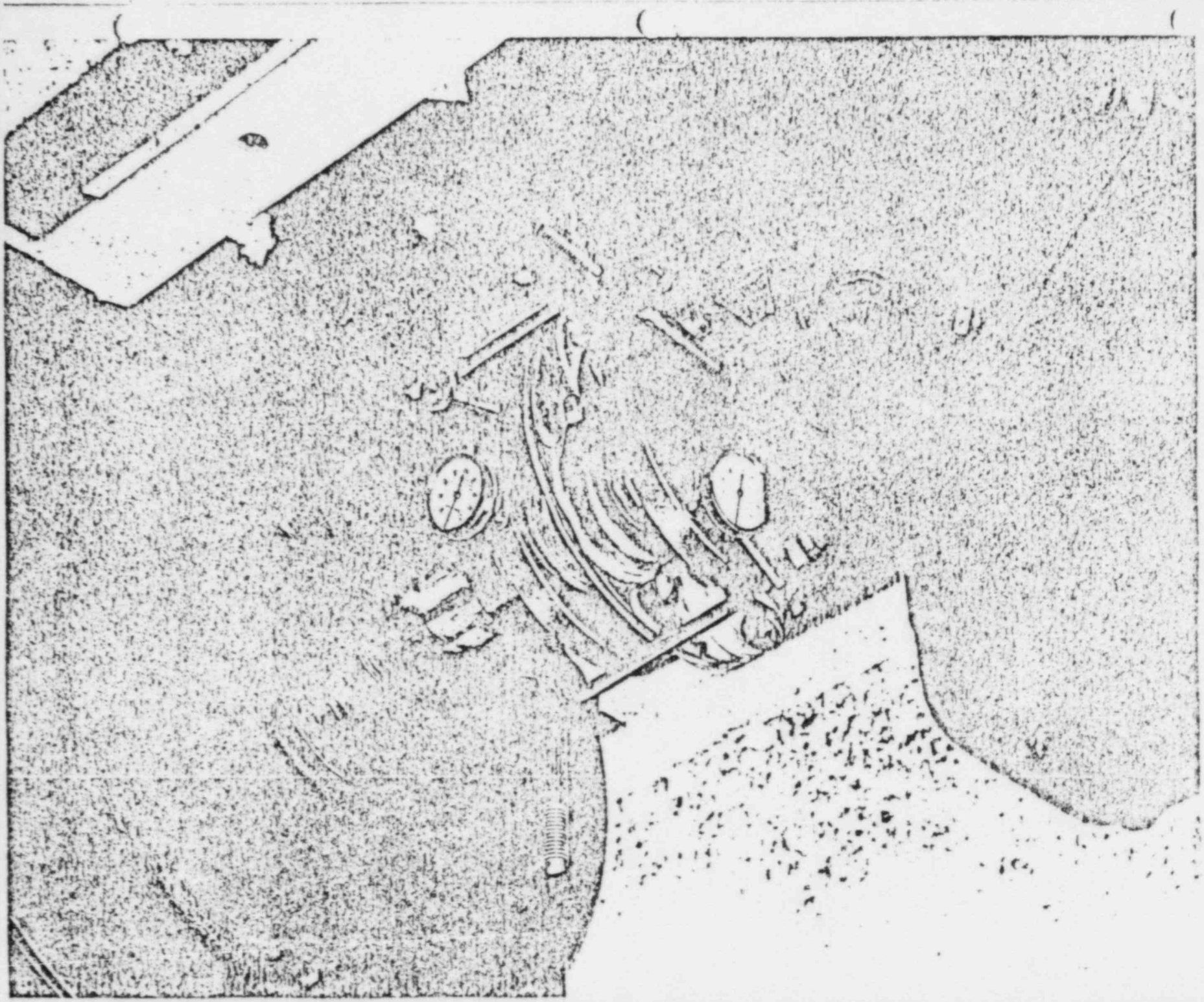


ILLUSTRATION NO. 5



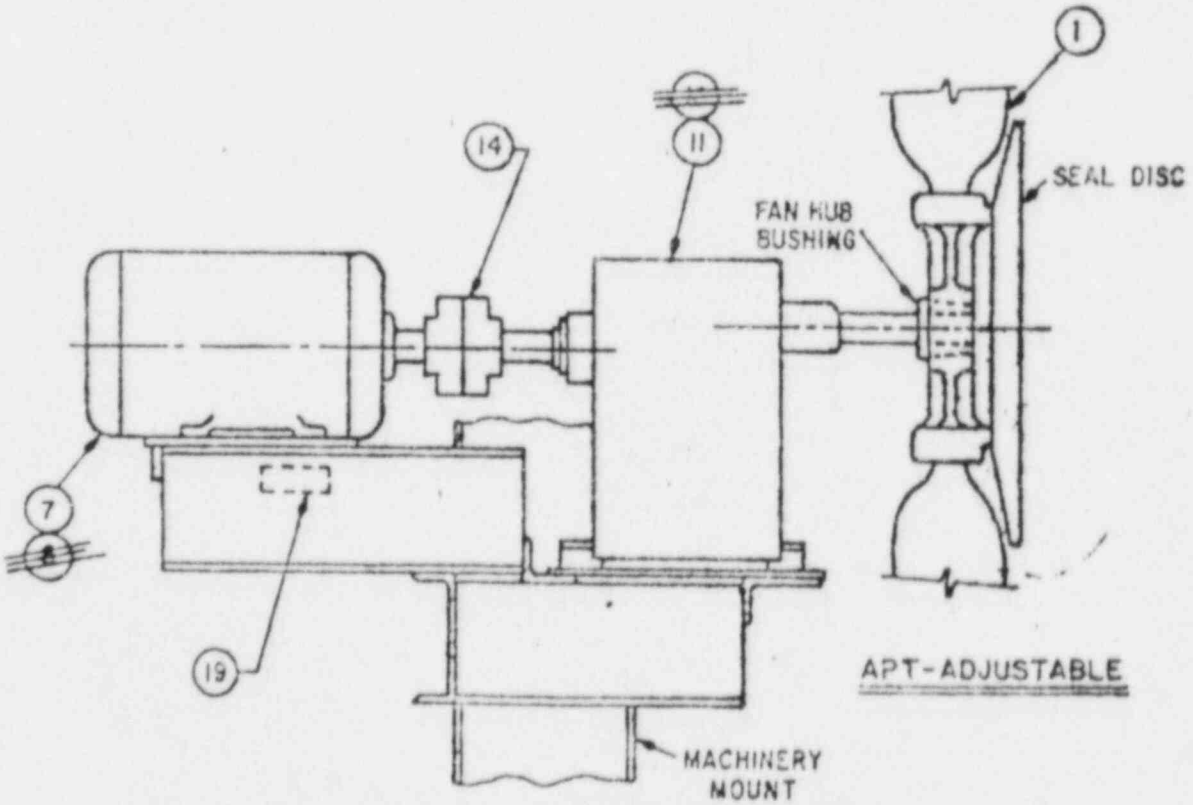
HUDSON PRODUCTS CORPORATION

MECHANICAL ASSEMBLY PARTS LIST NO. P1-1

JOB NO. 1D002

SHEET 2 OF 15

TYPE OF UNIT FPGA FAN APT



APT-ADJUSTABLE

HUDSON PRODUCTS CORPORATION

JOB NO. ND502

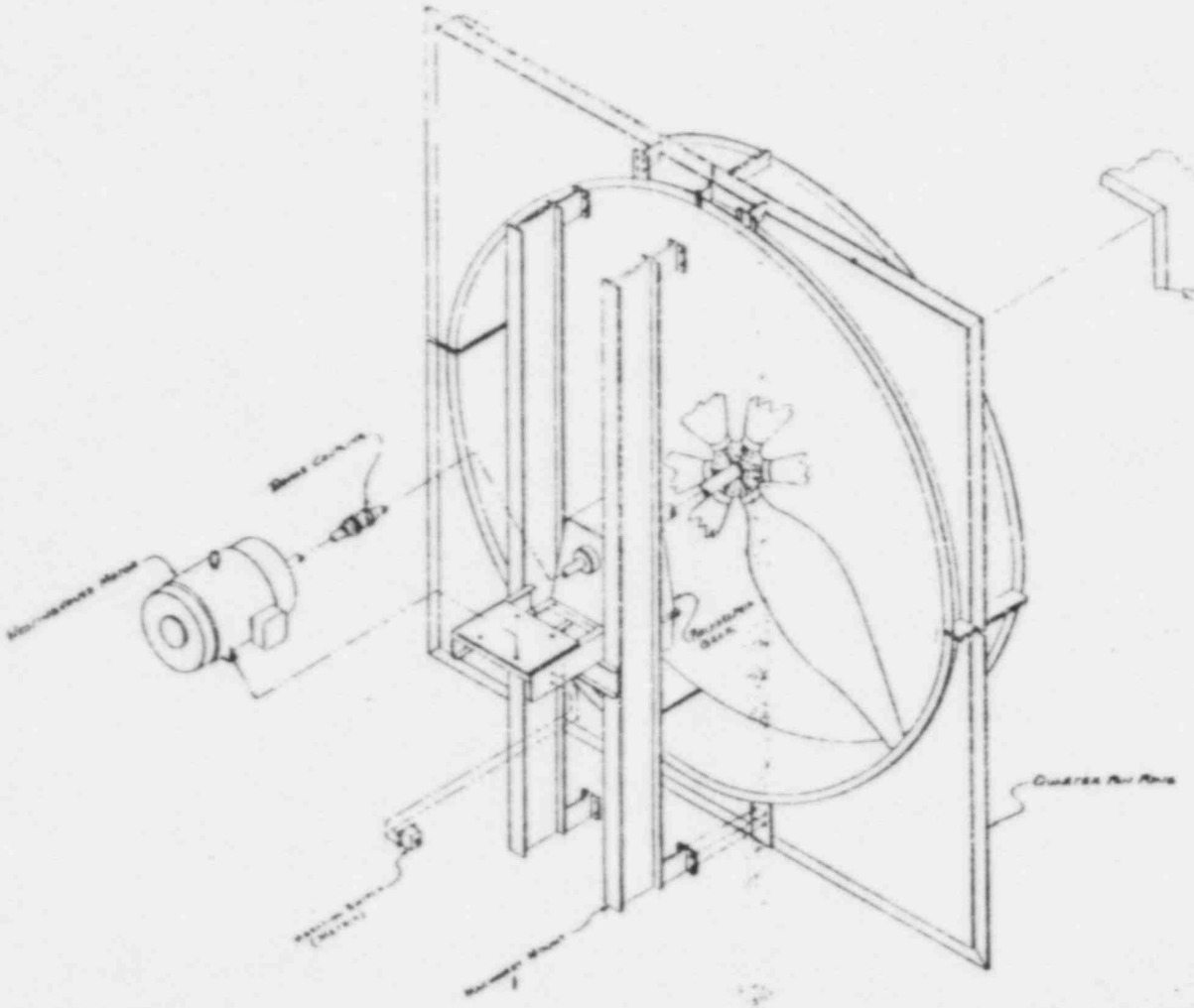
MECHANICAL PARTS LIST NO. PL1 ITEM NO. 1 SHEET 3 OF 15

BANK A COLOR CODE BLUE

MRK	QUAN	DESCRIPTION	SHP'D.
(1)	30	FAN HUDSON APT-14W-6, ADJUSTABLE PITCH, HUB MODEL 3206	
		BORE 4", C/W SEAL DISC, RETAINER R, CAP SCREWS, LOCK SCREW & LOCK WASHER	
(2)	~	FAN HUDSON AVT- , AUTO-VARIABLE PITCH, HUB MODEL	
		BORE 2 7/8", C/W SEAL DISC & VALVE POSITIONER ASSEMBLY NO. 2701A, 1701W,	
		RETAINER R, LOCK SCREW & LOCK WASHER.	
(3)	~	BIAS RELAY MOORE NO 661A2,3,4,6. (SEE INSTRUCTION MANUAL)	
(4)	~	AV "PIPE" AIR LINE CLIP PART NO. 4V02. NO. 04V02	
(5)	~	3/8"ø U-BOLT FOR 1 1/2"ø PIPE C/W 2 HEX NUTS NO. 15695	
(6)	~	AV "GUARD" AIR LINE CLIP PART NO 3G02 (9'ø THRU 16'ø N DRAFT) NO. 03G02	
(7)	30	MOTOR WESTINGHOUSE (TEFC / MAC) 1800/900 RPM, 460V 3 PH 60 CY.	
		FRAME NO 326-T, 40 HP. W/3" OVERSIZE CONDUIT BOX & 230 VOLT SPACE HEATER	
(8)	~	MOTOR RPM, V. PH CY	
		FRAME NO. , HP.	
(9)	~	BEARING DODGE SCM4, 2 15/16"ø BORE. NO 50100	
(10)	~	BEARING DODGE TYPE E, 2 15/16"ø BORE NO. 50110.	
(11)	30	GEAR PHILADELPHIA IN-LINE DOUBLE GEAR REDUCER 8HL2	
(12)	~	GEAR	
(13)	~	SHAFT COUPLING:	
(14)	30	GEAR & MOTOR COUPLING: THOMAS 225-AMR FLEXIBLE COUPLING	
(17)	~	AP FAN SHAFT: MK ,3"ø x LG. HUB END TAPERED STRAIGHT	
(18)	~	AV FAN SHAFT: MK ,3"ø x LG. HUB END TAPERED STRAIGHT	
(19)	30	VIBRATION SWITCH: METRIX NO. 5097-60	
(20)	30	HUDSON BELL SETS NO. M-890-L-1, 14'-0"ø C/W SCREWS (SEE 110 DWG.)	
(21)	~	GREASE LINE: 1/4" O.D. COPPER TUBING x 2'-0 LG. NO 52090	
(22)	~	GREASE LINE: 1/4" O.D. COPPER TUBING x 3'-6 9'-0 LG. NO. 52090	
(23)	~	TUBING CLIP PARKER NO. 3121-3-4 C/W NO. 10 DRIVE SCREWS. NO. 52010	
(24)	~	MALE CONNECTOR IMPERIAL NO. 68F-1/8" NPT TO 1/4" O.D. TUBING. NO. 52050	
(25)	~	BULKHEAD UNION IMPERIAL NO 53636 1/8" NPT TO 1/4" O.D. TUBING (MACH. MT) 52125	
(26)	~	BULKHEAD COUPLING IMPERIAL NO. 129-B-1/4" NPT NO. 52055	
(27)	~	WORM GEAR BAND: FOR 4"ø PIPE NO 52075	
(28)	~	HUDSON AUTOMATIC BELT TENSIONER & AIR-FAIL LOCK, PART NO.	
(29)	~	HUDSON VIBRATION NEUTRALIZER, PART NO.	
(30)	~	HUDSON TIP SEAL SETS: NO. M-851 (FOR 'ø FAN) C/W SCREWS. SEE INSTRUCTION MANUAL	
(31)	~	HUDSON FAN TIP SEAL ROLLER: NO. M-852	
(32)	~	MALE ELBOW. IMPERIAL NO. 69F-1/8" NPT TO 1/4" O.D. TUBING NO. 52070	

FOR LOCATION OF MARKS SEE MECHANICAL ASSEMBLY SHEET 2 THRU ~

FB:NG/FB



NUCLEAR

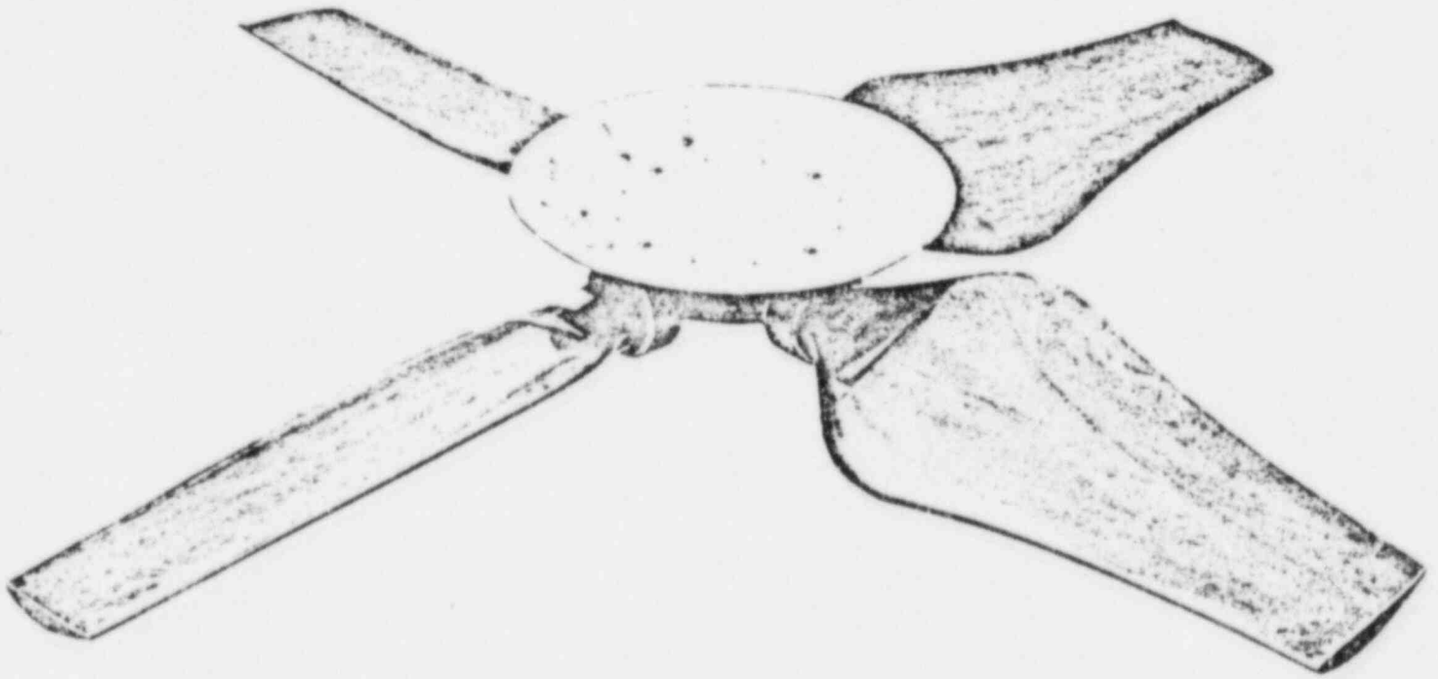
HUDSON TUF-LITE FANS

INSTALLATION AND OPERATION

ADJUSTABLE PITCH FANS 6' THROUGH 14' DIA.

3000 SERIES HUB

(FORMERLY AP-626 or AP-819)



TOUGH, LIGHTWEIGHT, MAINTENANCE-FREE BLADES

Hudson TUF-LITE Fan Blades are made from FIBERGLASS REINFORCED EPOXY RESIN having a very high strength-to-weight ratio and corrosion resistance. Blades are individually balanced eliminating the need to be replaced in matched sets.

HUDSON PRODUCTS CORPORATION

POST OFFICE BOX 36100 HOUSTON, TEXAS 77036, U.S.A.

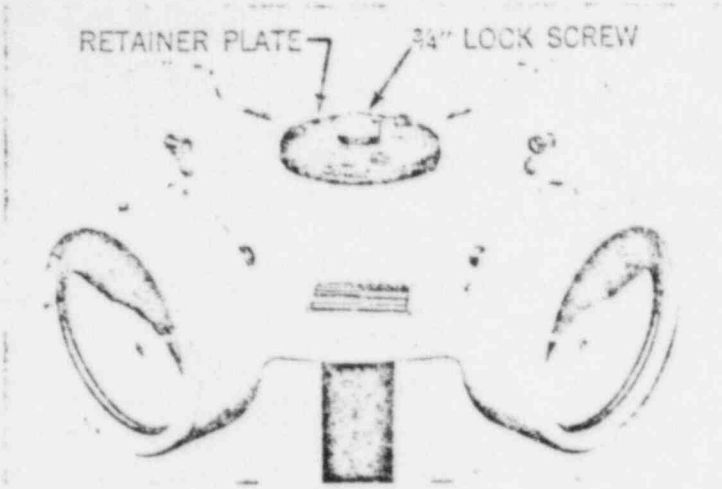


Fig. 1

Hub Body on Tapered Fan Shaft

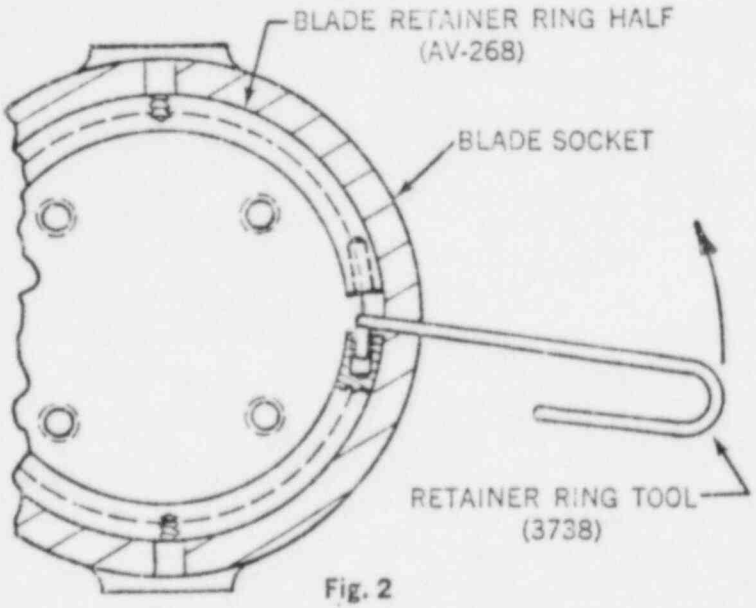


Fig. 2

Remove Blade Retainer Ring Half

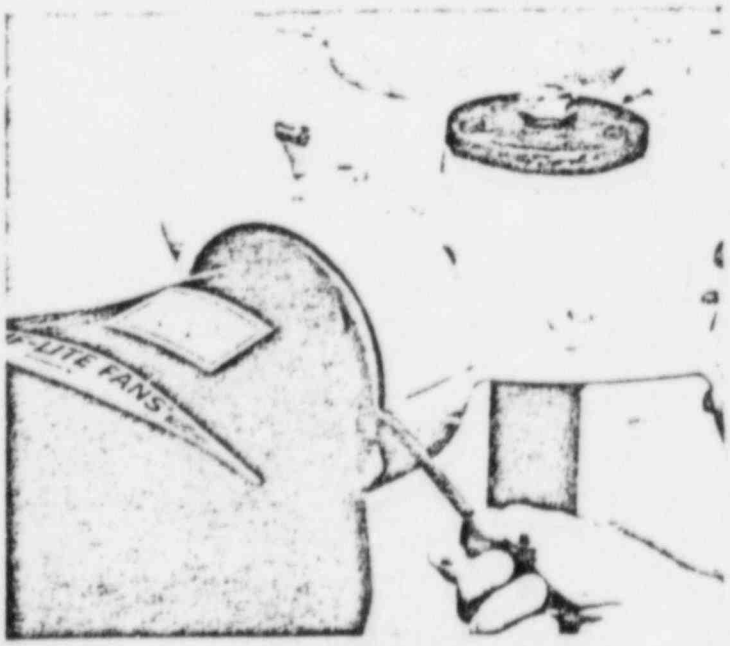


Fig. 3

Install Blade Retainer Ring Half

INSTALLATION INSTRUCTIONS

1. Clean all mating surfaces between the hub and bushing. Coat all threads and tapered I.D. in hub with white lead or similar antigalling type grease.

ASSEMBLY WHEN BUSHING IS USED

2. Slide Bushing (P-1015 or P-1005) and key on fan shaft. Shaft should be flush with end of bushing. Lock bushing on shaft by tightening set screw on flange of bushing. Use 3/16" hex wrench. Set hub squarely on bushing and engage the 3—⅜" cap screws in the bottom of the hub. Tighten evenly with 9/16" wrench.

ASSEMBLY WHEN TAPERED SHAFT IS USED

3. Align keyways and install Hub Body on fan shaft. Install Key. Install Retainer Plate and 3—⅜" Cap Screws on top of Hub Body. Install ¾" Lock Screw and Lockwasher into fan shaft. Tighten with 1¼" wrench to 100 ft.-lb. torque. Fig. 1 shows Hub Body installed on tapered shaft. **NOTE: ABOVE PARTS ARE FURNISHED WITH TAPERED SHAFT ONLY.**

THE FOLLOWING INSTRUCTIONS APPLY TO BOTH TYPES OF INSTALLATION

4. Remove both Blade Retainer Lock Screws (P-0142) with a screwdriver. These are #8-32 NC Screws.

5. Remove each Blade Retainer Ring Half (AV-268) by using the Retainer Ring Tool (3738). Insert the end of the tool into the hole in the end of the Retainer Ring Half and pry the ring out of the blade socket. Fig. 2 shows a section of the blade socket at the ring groove. If a tool is not available, a ¼" hook bent on the end of a piece of ⅛" diameter wire will be satisfactory.

6. To install a blade, insert the blade shank into the socket far enough to allow the Blade Retainer Ring Halves to be "snapped" into place. Insert one end of the ring into the groove and force the opposite end of the ring into place with the end of a screwdriver as shown in Fig. 3. Unscrew the ⅜" Blade Socket Cap Screws (P-0138) if more clearance is necessary to allow installation of the rings. Make sure rings are seated properly and lock them in place with the two Retainer Ring Lock Screws (P-0142).

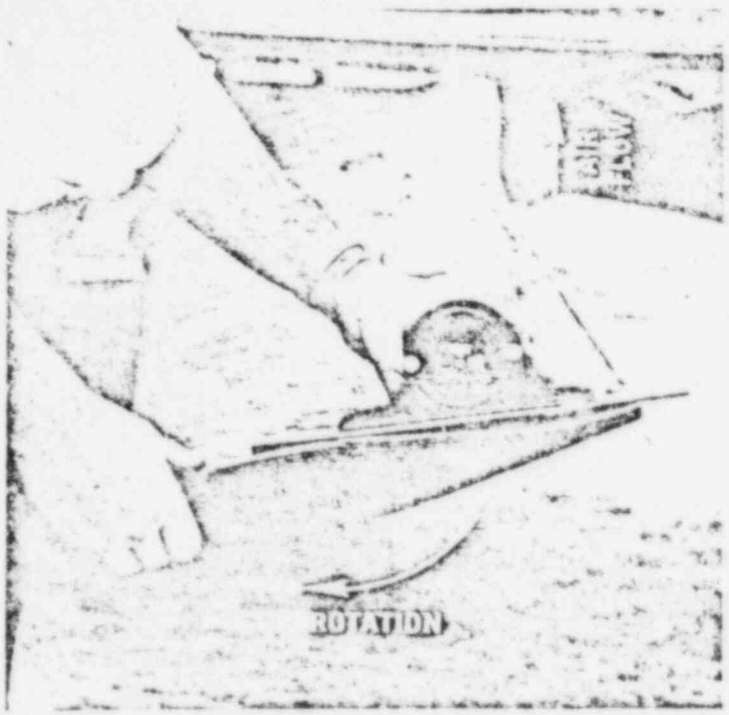


Fig. 4
Set Blade Pitch

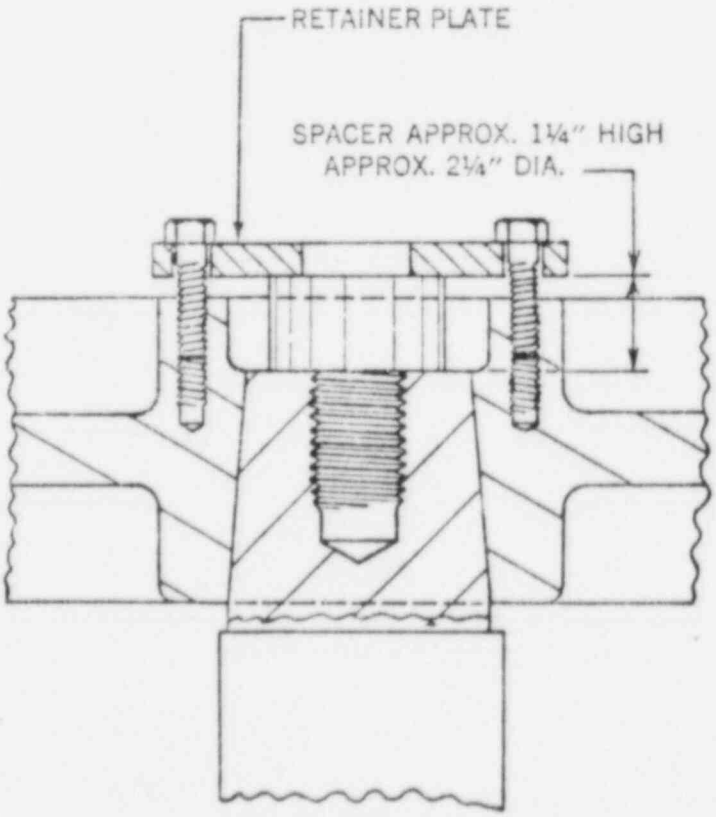


Fig. 5
Removing Hub Body From
Tapered Shaft

7. Tighten the four Blade Socket Cap Screws with a 9/16" wrench to make the shoulder on the blade shank bear against the retainer ring. Make sure the retainer ring is bottomed in the groove in the socket but do not overtighten. It may be necessary to back the cap screws off about one turn and retighten them in order to force the ring into a proper seat.

8. Install the remaining blades in the same manner.

9. Loosen the Blade Socket Cap Screws enough to adjust the blade pitch as shown in Fig. 4. Place a flat bar on the discharge side of the blade approximately 1" from the tip to provide a "base" for a protractor. **AFTER DESIRED PITCH ANGLE IS SET, CHECK TO MAKE CERTAIN BLADE RETAINER RINGS ARE PROPERLY SEATED IN BOTH HUB AND BLADE GROOVES AND TIGHTEN ⅜" CAP SCREWS TO 15 TO 20 FT-LBS TORQUE.**

10. Check blade track by rotating each blade past a fixed point on the fan ring. Maximum variation of track should not exceed ½".

11. Install Seal Disc (M-847) by fastening with 3 (on 6 blade hubs) or 4 (on 4 blade hubs) ⅜" Cap Screws (P-0167), Lockwashers (P-0318), and Flat Washers (P-0315).

12. To Remove Hub Body from tapered shaft remove ¾" Lock Screw, ⅜" Cap Screws and Retainer Plate. Install a spacer approximately 1¼" high and 2¼" diameter on top of the fan shaft. Replace the Retainer Plate and Cap Screws. Tighten the Cap Screws evenly to remove the Hub Body. See Fig. 5.

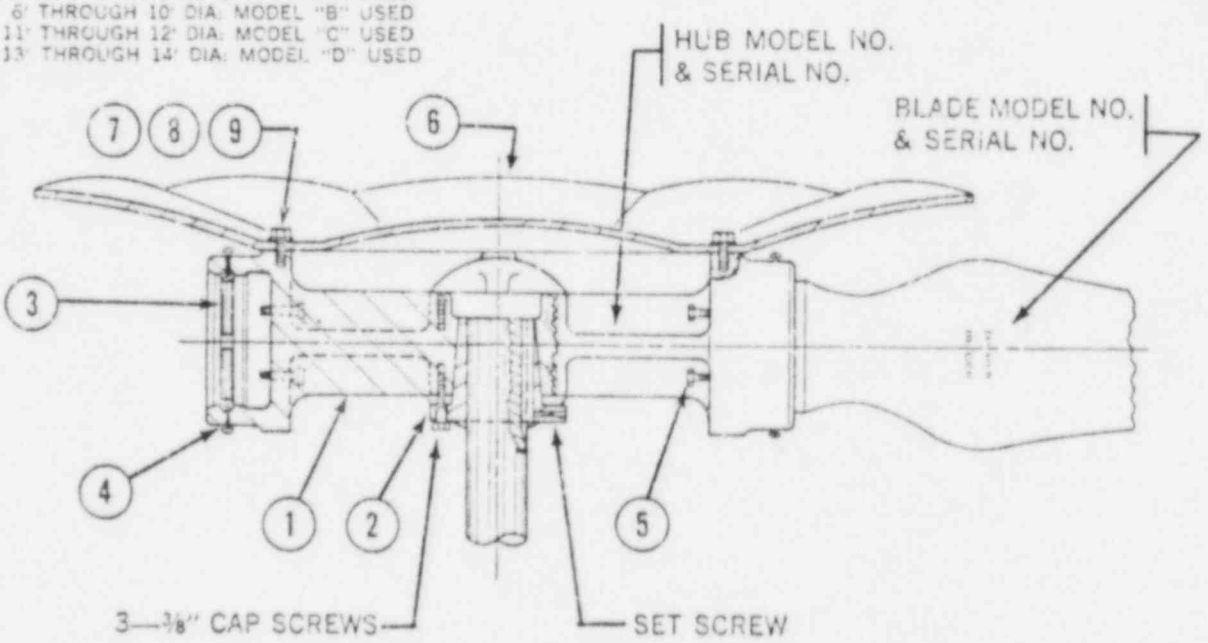
OPERATING INSTRUCTIONS

1. Start fan and check rotation. Fan should rotate in clockwise direction when viewed from discharge side. See Fig. 4.

2. Check power consumed by motor to be sure fan is pulling desired load. CAUTION: Power required varies inversely with air temperature. Example: Power required will decrease as air temperature increases.

	SHAFT DIAMETER	1"D. THROUGH 2⅛"D.		2¼"D. THROUGH 3⅛"D.	
	NUMBER OF BLADES	4	6	4	6
	COMPLETE HUB ASSEMBLY NUMBER*	3104	3106	3204	3206
1	HUB BODY NUMBER	3734	3736	3744	3746
2	* BUSHING NUMBER	P-1015	P-1015	P-1005	P-1005
3	BLADE RETAINER RING HALF (AV-268)	8	12	8	12
4	RETAINER RING LOCK SCREW (P-0142)	8	12	8	12
5	BLADE SOCKET CAP SCREW (P-0138)	16	24	16	24
6	* * SEAL DISC (M-847)	1	1	1	1
7	CAP SCREW (P-0167)	4	3	4	3
8	LOCK WASHER (P-0318)	4	3	4	3
9	FLAT WASHER (P-0315)	4	3	4	3

* NOT USED IF TAPERED SHAFT FURNISHED
* * 6' THROUGH 10' DIA. MODEL "B" USED
11' THROUGH 12' DIA. MODEL "C" USED
13' THROUGH 14' DIA. MODEL "D" USED



STD. MATERIALS & FINISHES

BLADES: FIBERGLASS REINFORCED EPOXY
HUB BODY: CAST IRON, ENAMEL FINISH
BLADE RETAINER RING: MONEL 400

SEAL DISC STANDARD FOR FAN ASSEMBLIES WITH MODEL "T-B" BLADES ONLY

WHEN ORDERING SPARE PARTS REFER TO FAN ASSEMBLY NO.:

ADJUSTABLE PITCH → AP
BLADE MODEL & SIZE (FT) → T-14-B
NO. BLADES → 4
SHAFT DIA. → 2⅞" BORE

HUDSON PRODUCTS CORPORATION

ADJUSTABLE PITCH FAN ASSEMBLY 6' THROUGH 14' DIA.

SERIES 3000 HUB

ISSUED APRIL 68
FORM IN-3000

FAN PITCH SETTING

An estimated fan pitch setting for Hudson "SOLO-AIRE" air coolers may be found in the "General Arrangement Drawing" shown in the air cooler instruction manual. This pitch angle will produce the specified air flow at Operating (Design) Temperature and load the motor to Design Horsepower shown on specification sheets. On fans sold separately, estimated pitch angle and horsepower can be determined from "Certified Fan Performance Curve." Usually the pitch must be set before the unit goes on-stream and is cold. It is important to note that when air to the fan is at lower than operating temperature when fan pitch is adjusted, the motor load will decrease when the air is at operating temperature. For this reason the pitch adjustment must give a higher than design H.P. load when the air temperature to the fan is lower than the design or operating temperature.

When the pitch must be set on a "cold unit" the nomograph is used to find the correct motor load (amperage) at the ambient temperature when the pitch is being adjusted. This will yield the correct (design) load, when the unit is running at its operating temperature. Also, if pitch is set to load motor at design temperature, the motor may be overloaded if run in low air temperatures.

To Set Fan Pitch: (If noise level specifications are in effect, see Chart 4/4.)

1. See fan "Installation and Operation" for procedure and set fan blades at estimated pitch angle shown either on "General Arrangement Drawing" or "Certified Performance Curve."
2. Calculate "Required Motor Amperage" as shown below.
3. Readjust the fan pitch until "Required Motor Amperage" is attained.

The following information must be known:

(1) Ambient Air Temperature (or density) when pitch is set.
(2) Operating (Design) Air Temperature at the fan. (Outlet Air Temperature for induced draft, Inlet Air Temperature for forced draft units.)
(3) Design Horsepower.
(4) Rated (nameplate) motor Horsepower, Voltage, Amperage.
(5) Line Voltage at the motor.

Sample Problem I -

Ambient Temp. (T_{Amb}) = 80°, Operating Temp. (T_{Oper}) = 140°
Design HP = 16.1
Nameplate Data: 20 HP, 440 Volts, 25.5 Amps.
Line Voltage = 446 Volts

(1) From Nomograph (See Reverse Side): T_{Amb} = 80°, T_{Oper} = 140°, HPF = 1.12
(2) Required HP (Ambient Temp.) = 16.1 x 1.12 = 18.03 HP
(3) Required Motor Amperage:

$$\text{Required Amps} = \frac{\text{HP(Amb)}}{\text{HP(Rated)}} \times \frac{\text{Rated Voltage}}{\text{Line Voltage}} \times \text{Rated Amps}$$

$$= \frac{18}{20} \times \frac{440}{446} \times 25.5 = 22.6 \text{ Amps}$$

In other words, if fan pitch was set to load motor to 22.6 Amps @ 80° Air Temp., when unit was at 140° Air Temp., motor would be loaded to proper Design HP.

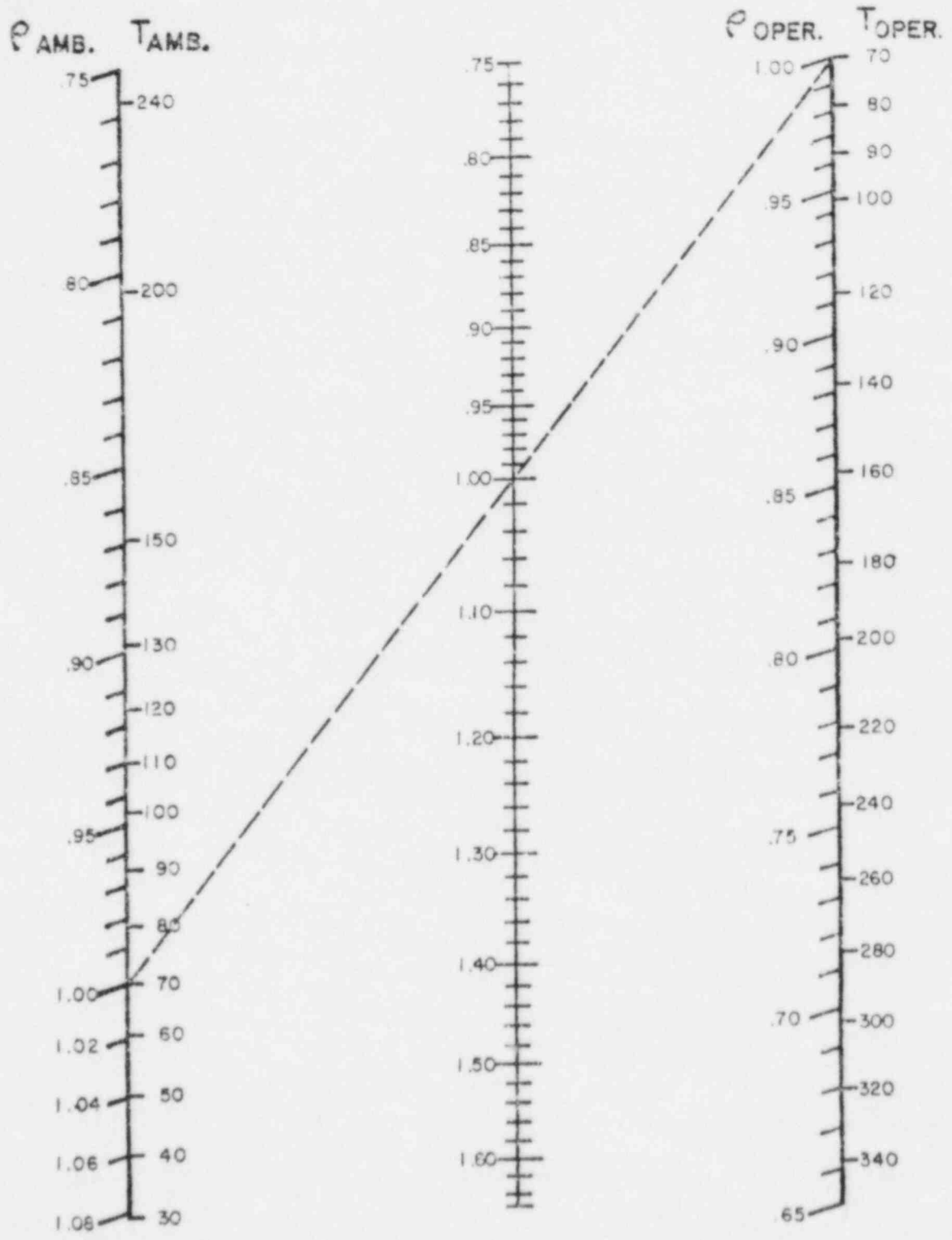
Sample Problem II -

Ambient Temp. (T_{Amb}) = 60°, Operating Temp. (T_{Oper}) = 225°
Design HP = 17.6
Nameplate Data: 20 HP, 440 Volts, 25.5 Amps
Line Voltage = 460 Volts

(1) From Nomograph: T_{Amb} = 60°, T_{Oper} = 225°, HPF = 1.32
(2) Required HP (Ambient) = 17.6 x 1.32 = 23.2 HP
(3) Required Motor Amperage: Required Amps = $\frac{23.2}{20} \times \frac{440}{460} \times 25.5 = 28.4$ Amps

In this case, where the ambient temperature is 60°, the motor will be overloaded and should be run only a short time. When the unit reaches its operating temperature, the fan will have proper pitch to use design horsepower.

HORSEPOWER FACTOR NOMOGRAPH



AMBIENT TEMP (°F) OR DENSITY

H.P. FACTOR

OPERATING TEMP (°F) OR DENSITY

H.P.(AMBIENT TEMP.) = H.P.(DESIGN) X H.P. FACTOR

6-3-60

ADJUSTMENT OF NOISE LEVEL
FOR REFLECTIVE SURFACES AND VARYING FAN POWER

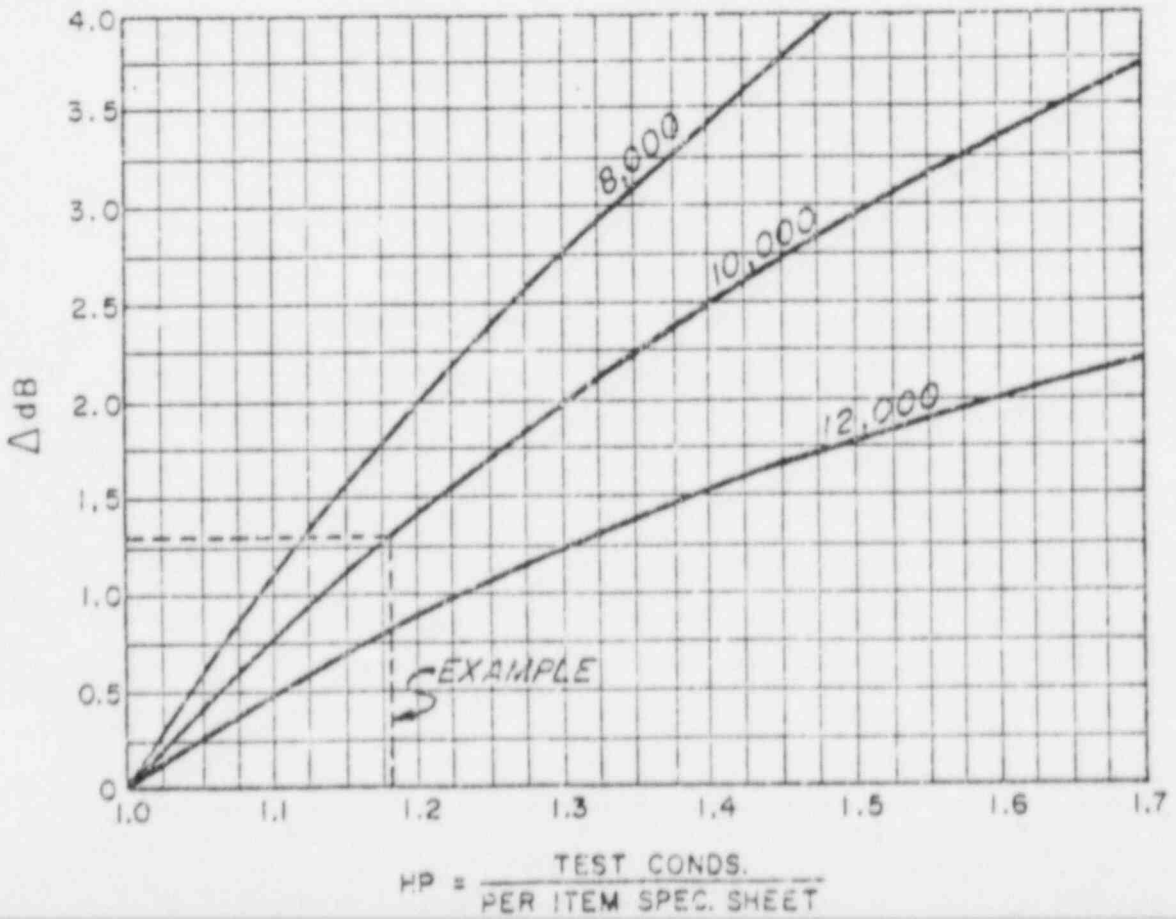
When testing equipment for comparison with a noise specification, there are certain limitations that must be considered. Hudson does not guarantee noise readings in zones affected by reflecting surfaces (such as solid plate walkways). If such a zone must be covered, an allowance for reflection will be determined.

When the unit is tested for noise and the motor hp exceeds the specified operating hp on the Hudson item specification sheet, an allowance must be made for the additional noise generated. The chart below shows the amount of this allowance.

Example: Motor hp = 30. Specified hp/fan = 23.7. Actual test hp = 28.
Tip speed = 10,000 ft/min.

$$Hp = \frac{\text{Test Conds.}}{\text{Per Item Spec. Sheet}} = \frac{28}{23.7} = 1.18$$

Following the vertical line of 1.18 to its intersection with the 10,000 ft/min. line, $\triangle dB = 1.3$. Therefore, 1.3 dB must be subtracted from each noise reading. This will permit tests to be made at the blade pitch setting which obtains maximum air flow, and will avoid the expense of two blade pitch changes. (1. To set blades at operating hp specified by the item specification sheet for a noise warranty test. 2. To set blades at the pitch angle which will load the motor to capacity and obtain maximum air flow at operating conditions.)



HUDSON PRODUCTS CORPORATION

CERTIFIED FAN PERFORMANCE

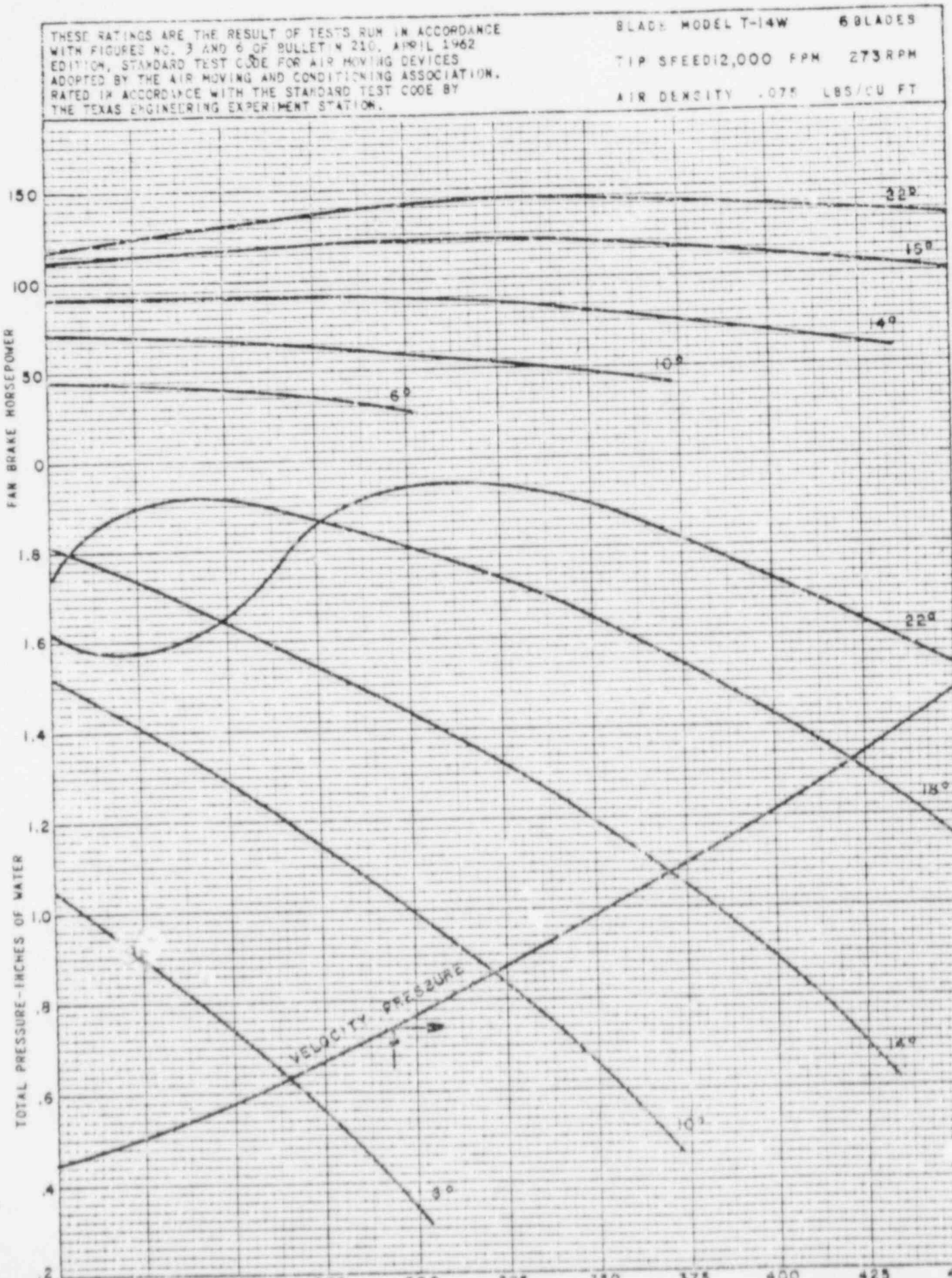
T-14W-6

THESE RATINGS ARE THE RESULT OF TESTS RUN IN ACCORDANCE WITH FIGURES NO. 3 AND 6 OF BULLETIN 210, APRIL 1962 EDITION, STANDARD TEST CODE FOR AIR MOVING DEVICES ADOPTED BY THE AIR MOVING AND CONDITIONING ASSOCIATION. RATED IN ACCORDANCE WITH THE STANDARD TEST CODE BY THE TEXAS ENGINEERING EXPERIMENT STATION.

BLADE MODEL T-14W 68LADES

TIP SPEED12,000 FPM 273RPM

AIR DENSITY .075 LBS/CU FT

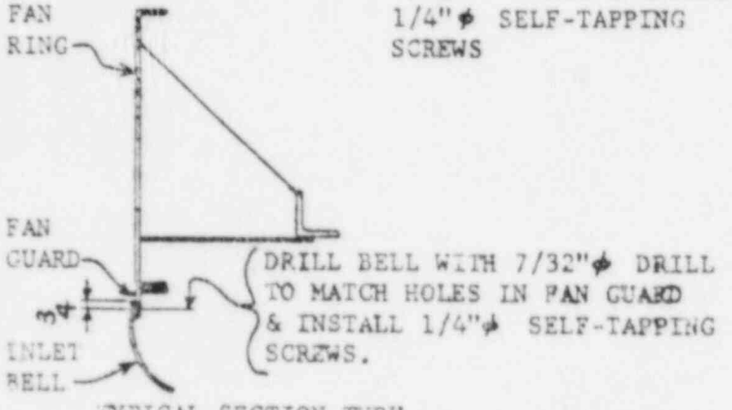


ISSUED APRIL, 1972

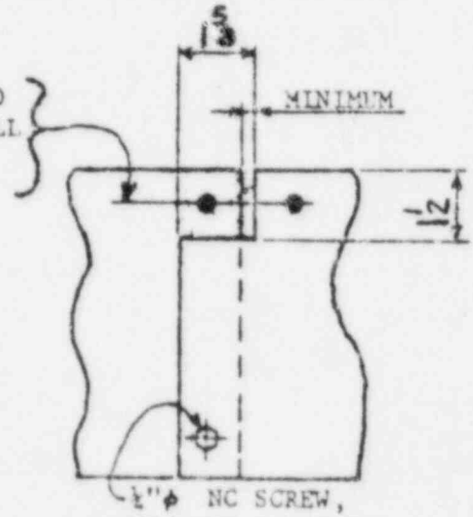
HPC STD. | HUDSON PRODUCTS CORP. | HPC STD.

INLET BELL INSTALLATION
FORCED DRAFT UNITS

THE PURPOSE OF THE HUDSON INLET BELL IS TO REDUCE FRICTION LOSSES DUE TO THE ABRUPT CORNERS IN FAN RINGS. THIS IMPROVES AIR DISTRIBUTION AND FAN EFFICIENCY.



TYPICAL SECTION THRU
FAN RING & INLET BELL



TYPICAL INLET BELL SPLICE

INSTALLATION:

1. ALIGN THE UPPER EDGE OF AN INLET BELL SECTION APPROX. 3/4" ABOVE THE 7/32"ϕ SHOP DRILLED HOLES IN THE FAN GUARD. USING A 7/32"ϕ DRILL, DRILL HOLES IN BELL SECTION TO MATCH HOLES IN FAN GUARD AND APPROX. 1" FROM EACH END OF SECTION THRU FAN GUARD AND BELL SECTION.

2. INSTALL ¼"ϕ NC WASHER HEAD SELF-TAPPING SCREWS TO SECURE BELL SECTION TO FAN GUARD.

3. INSTALL THE NEXT SECTION IN THE SAME MANNER. THE MATING ENDS SHOULD BE BUTTED TOGETHER WITH NO GAP BETWEEN.

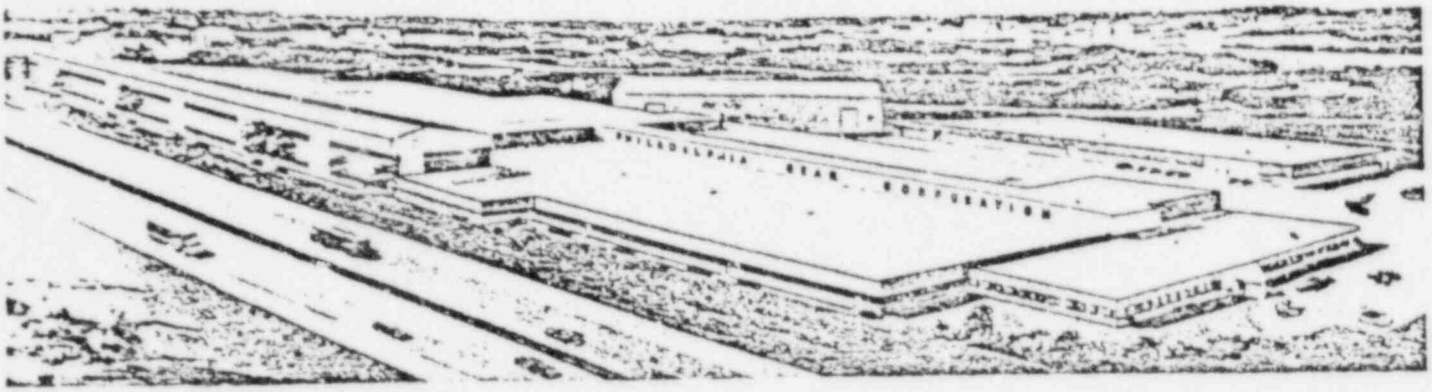
4. IN ADDITION TO THE SCREWS INSTALLED IN THE FAN RING, DRILL ONE HOLE IN THE LAP JOINT OF THE CURVED SECTION OF THE BELL THRU THE TWO MATING SECTIONS. INSTALL A ¼"ϕ NC SCREW, WASHER AND HEX NUT TO SECURE THE TWO SECTIONS AND REDUCE VIBRATION. (SEE "TYPICAL INLET BELL SPLICE" ABOVE.)

5. INLET BELLS MAY REQUIRE NOTCHING OR SPECIAL TRIMMING AROUND STRUCTURE DURING INSTALLATION. THIS CAN EASILY BE DONE USING A COMMON HACKSAW.

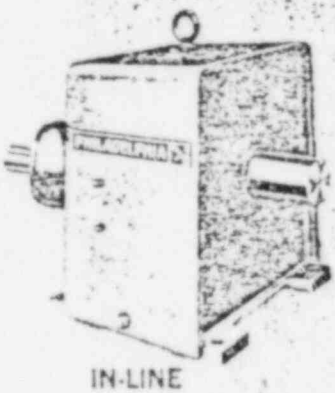
DATE:

PHILADELPHIA

GSM-175

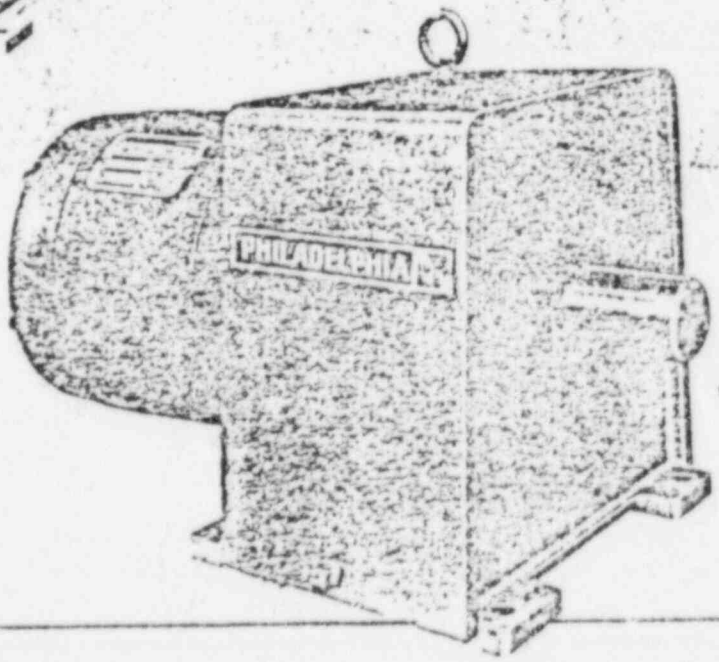


GEARMOTOR SERVICE MANUAL



IN-LINE

MOTOREDUCER



GEARMOTOR

MEMBER OF AGMA

CONTENTS

FOREWORD

Your Philadelphia Gear Corporation Gearmotor, Motoreducer, or In-Line Reducer is a high quality, rugged machine designed in accordance with Standards of the American Gear Manufacturers Association to give years of trouble free service. However, certain precautions and procedures must be observed in handling, installing, and servicing the unit in order to obtain optimum performance. This manual contains general installation, operating, maintenance and troubleshooting instructions for your reducer. Should questions arise that are not covered in this booklet, additional information can be obtained by contacting your local representative, or the Service Dept.—Reducer Division—at the Philadelphia Gear Corporation, King of Prussia, Pennsylvania. (Telephone: 215-265-3000—TWX Number: 510-660-3952.)

All inquiries should be accompanied by the following information, which can be obtained from the unit nameplate:

Unit size and type
Philadelphia Gear Corp. Order No.
Serial Number

(Orders for renewal parts should include description and part number shown on parts list.)

GENERAL INSTRUCTIONS

1. Any apparent or suspected damage sustained by equipment manufactured or furnished by Philadelphia Gear Corporation during transport from the factory to the user should be immediately reported to both the Philadelphia Gear Corporation and to the Carrier.

2. Upon delivery all equipment furnished should be carefully inventoried against shipping papers to determine whether any shortages exist in delivered material. Any such shortages must immediately be reported to Philadelphia Gear and the Carrier if a timely claim is to be made.

3. The installation of most power transmission equipment does not normally require the services of a factory engineer. These services are not included in the selling price of the equipment, unless specifically agreed upon in writing between the seller and purchaser. In applications requiring a more complex arrangement of components, consideration should be given to the use of a factory engineer for construction supervision or check-out of the installation. These services are available from Philadelphia Gear by contacting the Service Department.

4. The Seller's Warranty applies insofar as the unit is operated within the rating and service conditions for which it was specifically sold.

The purchaser must prevent the existence of any destructive external conditions, which might typically include vibratory loads due to critical speeds, severe shock loading, mechanical or thermal overloads, or other conditions concerning which the seller was not fully advised. Also, the unit must be installed and maintained in accordance with instructions contained in these service instructions.

5. Adequate installation, maintenance and safety instructions must be given by the user to personnel directly responsible for the operation of the equipment.

6. Guards, alarms, heaters and other safety devices furnished by the manufacturer must be installed by the user. In addition, the procedures set forth in the operating instructions must be carefully followed.

7. The user is also responsible for furnishing and installing any guards or other safety equipment needed to protect operating personnel, even though such safety equipment may not have been furnished by the seller with the equipment purchased.

8. All unauthorized personnel should be required to remain a safe distance away from rotating shafts, couplings, clutches, etc.

9. In the event of malfunction within the warranty period, the manufacturer must be informed promptly or, in any event, within thirty days if it is intended that the warranty is to cover the incident.

GENERAL DESIGN FEATURES

The following descriptive material applies to the majority of Philadelphia Gearmotors, Motoreducers and In-Line Reducers. There are occasions when operating conditions or design considerations dictate deviations from the standard arrangements described in this service manual; when special instructions are required contact factory.

The gear drives covered in this service manual are categorized and designated as follows:

1. Horizontal Series—the horizontal series of gear drives include the Integral Gearmotors (designated HG), the Utility Gearmotors (designated HS) and the In-Line Reducers (designated HL).

2. Vertical Series—the vertical series of gear drives include the Integral Motoreducers (designated VG), the Utility Motoreducers (designated VS) and the In-Line Reducers (designated VL).

The horizontal and vertical series of In-Line Reducers are identical to the corresponding horizontal Utility Gearmotors and vertical Utility Motoreducers but do not have factory mounted motor scoops and motors. However, some In-Line Reducers are shipped with both the drive motor and the gear unit separately mounted on a common base plate and connected together by a flexible coupling. Also, some utility units of both the horizontal and vertical series arrangements are supplied without motors (but with factory mounted scoops) to allow for field installation of customer supplied drive motors.

HOUSING—The rotating parts of the horizontal gearmotors, the larger size vertical motoreducers and the in-line reducers are contained in an oil tight welded steel housing. Some of the smaller size vertical motoreducers and vertical in-line reducers have cast iron housings.

The housing is of one piece construction with the motor mounting side of housing enclosed with a removable fabricated steel cover plate (motor adapter plate on integral gear units and housing cover on utility gear units). On the integral gearmotors and the integral motoreducers, the "D" flange motor is bolted to the motor adapter plate with the motor shaft extending thru the plate. The high speed pinion is mounted on the motor shaft.

In the utility gearmotors, utility motoreducers and in-line reducers the housing cover contains the high speed shaft assembly. The high speed shaft extends beyond the housing cover and is externally coupled to a scoop-mounted drive motor or, in the case of the in-line reducers, to the prime mover. On the utility gearmotors and utility motoreducers, the motor scoop is fastened to the housing cover plate by hex head capscrews and lock washers. When motors are mounted on scoops, scoop and scoop spacer are tack welded to the housing cover after motor-to-unit alignment.

The sealing surface of the motor adapter plate or housing cover (as applicable) and the mounting surface of the housing are machined and coated with a fluid sealing compound (gasket). The motor adapter plate or housing cover is fastened to housing by capscrews locked with split-type lockwashers or sealing washers.

All internal bearing plates are dowelled in place and secured with capscrews. Capscrews are locked in place with Loctite on threads.

HORIZONTAL SERIES BEARING ARRANGEMENT — Shafts are supported throughout the gear drives on anti-friction bearings. Philadelphia Gearmotors and In-Line Reducers use helical gears in a design arrangement which results in a lateral thrust on each shaft. The bearings used are subjected to these thrust loads in addition to the radial loads.

In the smaller units, all shafts are supported by single row ball bearings arranged to take both the radial and the thrust loads. In the larger drives, tapered roller bearings are used on the low speed shaft of all units. High speed and intermediate speed shafts are mounted on either ball bearings or tapered roller bearings. In some of the larger units, tapered roller bearings are used exclusively.

Utility gearmotors (HS), integral gearmotors (HG) and in-line reducers (HL) are identical except for the use of a high speed input assembly on the HS and HL units. Depending on unit size and number of reductions, the high speed input shaft is mounted either on ball bearings or tapered roller bearings. The high speed input shaft of quadruple reduction utility gearmotors and in-line reducers always is mounted on ball bearings. Where ball bearings are used, shaft lateral play of .015 inch is built into the unit and adjustments are not generally required.

However, in units having shafts mounted on tapered roller bearings, shaft lateral clearance adjustments are made by altering shim thickness or by adjusting bearing locknuts at designated points. Where tapered roller bearings are used and are held in place with thru caps or locknuts, the bearings are adjusted to provide .002 to .004 inch lateral clearance. Tapered roller bearings held in place by a bearing plate are adjusted to provide .001 to .005 inch lateral clearance.

Tapered roller bearings of the high speed assemblies in the HS or HL series are adjusted for proper lateral end play by shimming between the shaft thru cap and the housing cover plate. The method and location where lateral adjustments are made for all other tapered roller bearings in the different reduction configurations of these type units are as follows:

1. Single Reduction Units—By shimming between low speed shaft inboard bearing plate and bearing block.

2. Double Reduction Units—By shimming between low speed output shaft in-

board bearing and bearing plate, and between intermediate shaft inboard bearing and bearing plate.

3. Triple Reduction Units—By shimming between low speed output shaft inboard bearing and bearing plate, by shimming between second intermediate shaft inboard bearing and bearing plate, and by adjusting locknut on first intermediate shaft.

4. Quadruple Reduction Units — By shimming between low speed output shaft inboard bearing and bearing plate, by shimming between third intermediate shaft (low speed pinion shaft) inboard bearing and bearing plate, and by adjusting locknut on second intermediate shaft. (First intermediate shaft on all horizontal quadruple reduction units is ball bearing mounted and does not require adjustment.)

VERTICAL SERIES BEARING ARRANGEMENT — Philadelphia Motoreducers of series VG and VS, and vertical In-Line Reducers (VL) have the identical bearing arrangement as each equivalent horizontal gearmotor unit in series HG and HS, and horizontal in-line reducers (HL) except for the low speed output shaft. Motoreducer and in-line reducer output shafts are mounted on tapered roller bearings selected to suit the large shaft diameters, the external thrust loads and the overhung loads applied to long shaft extensions.

Tapered roller bearing adjustments in the vertical units are made at the same relative locations as in the corresponding horizontal units, except in vertical gear unit sizes 8 thru 10. In these units, the low speed output shaft is adjusted by shimming between outboard bearing and output end thru cap to provide .002 to .004 inch lateral end play. Except for the output shaft, the lateral clearance of the bearings is the same as in the horizontal units (.002 to .004 inch where bearings are held in place by thru caps or locknuts, and .001 to .005 inch where bearings are held in place by bearing plates).

Ball bearings are used on the oil pump drive shaft of the vertical units using oil pumps.

OIL SEALS—Lip type oil seals are used on the shaft extensions and are spring loaded with sealing elements of synthetic rubber. Horizontal series units that are to be mounted in a vertical position with output shaft down may be equipped with a stuffing box on the output shaft.

SPECIAL SEALS—Gear drives operated in dusty or corrosive atmospheres should be equipped with special seals and breathers designed for these conditions. Similarly, units subjected to moisture and vapor laden atmospheres, or hose-down, should be furnished with a special seal designed for these conditions. Unusual environmental conditions should be detailed to the manufacturer at the time the gear unit is ordered.

GEARING—Gearing is identical in equivalent horizontal and vertical gear drives. Single helical gear and pinion combinations are used throughout these units. Pinions and gears are hobbed and shaved. Alloy steel material is used for both pinions and gears. Smaller size gear sets are thru hardened, larger sizes also are surface hardened. All pinions, except low speed pinions, are bored and mounted on their shafts with key and press fit, and are secured axially with snap rings or shrink rings. Loctite Retaining Compound No. 75 is used on all pinion bores. Low speed pinions are cut integrally on their shafts. Gears are mounted on shafts with keys and shrink fit.

LUBRICATION SYSTEM—HORIZONTAL SERIES—Lubrication of the horizontal series of gear drives generally is accomplished by submersion and splash, utilizing a reservoir of oil maintained in the unit. In the splash system of the standard horizontal series units, the oil level maintained in the unit is dependent on the number of reduction stages. The level is set high enough to maintain adequate lubrication of gears and bearings. The general characteristics of the splash system, significant to the different reduction configurations of the horizontal series of gear drives, are as follows:

1. Single Reduction Units—Oil level is maintained high enough to partially submerge low speed gear and output shaft bearings. The high speed bearings used in type HS and HL units are splash lubricated.

2. Double Reduction Units—Oil level is maintained high enough to partially submerge high speed gear, low speed pinion and low speed pinion shaft bearings. Low speed shaft outboard bearing is lubricated by oil scraped from low speed gear by a scraper. The low speed shaft inboard bearing and the high speed bearings used in type HS and HL units are splash lubricated.

3. Triple Reduction Units—Oil level is maintained high enough to partially submerge high speed gear, intermediate gear and low speed gear. Intermediate shaft bearings and low speed pinion shaft bearings are submerged in oil. Low speed shaft outboard bearing is lubricated by oil scraped from the low speed gear by a scraper. High speed shaft bearings used in type HS and HL units and the low speed shaft inboard bearing are splash lubricated.

4. Quadruple Reduction Units—Oil level is maintained high enough to partially submerge high speed gear, both intermediate gears and the low speed gear. Second intermediate shaft bearings and low speed pinion shaft bearings are submerged in oil. Low speed shaft inboard bearing, first intermediate shaft bearings, and the high speed shaft bearings used in type HS and HL units are splash lubricated. Low speed shaft outboard bearing is lubricated by oil scraped from the low speed gear by a scraper.

IF A HORIZONTAL SERIES UNIT IS TO BE MOUNTED IN A POSITION OTHER THAN THE STANDARD HORIZONTAL FOOT MOUNTING, PHILADELPHIA GEAR CORPORATION MUST BE ADVISED WHEN EQUIPMENT IS ORDERED.

When a horizontal series unit is ceiling mounted, side wall mounted, mounted on an incline or mounted with the output shaft vertical, the oil level is specially located to partially submerge all gear sets and to submerge or splash all bearings. Generally, for these types of mountings special motor seals are provided, and in some instances special gear drive output shaft seals or stuffing boxes may be used.

In some special applications, motor driven pumps for force-feed lubrication may be supplied.

LUBRICATION SYSTEM—VERTICAL SERIES SIZES 3 THRU 7—Lubrication of the vertical series of gear drives sizes 3 thru 7 is accomplished by submerging all bearings and gears except the high speed shaft bearings in type VS and VL units, and a permanently lubricated first intermediate shaft upper bearing in quadruple reduction units. The high speed bearings are grease lubricated thru a grease fitting except in the size 7 double reduction units where only the high speed shaft upper bearing is grease lubricated and the high speed shaft lower bearing is submerged in oil.

The low speed shaft uses three oil seals to prevent oil leakage. Two oil seals are located above the lower low speed bearing and one oil seal below bearing. The lower low speed bearing is grease lubricated.

LUBRICATION SYSTEM—VERTICAL SERIES SIZES 8 THRU 10—Lubrication of the vertical series of gear drives sizes 8 thru 10 is accomplished by force feed lubrication by means of a shaft driven oil pump. The pump is externally accessible for servicing.

The pump is driven at drive motor speed in the double and triple reduction units and at a slightly slower speed in the quadruple reduction units. Oil is pumped from an oil reservoir maintained in the units, up thru the hollow pump shaft and discharged (sprayed) over the gears and bearings. The hollow pump shaft eliminates the need for piping except in the quadruple reduction units. In these units, a second internal spray line is connected to the pump and is used to spray the high speed gear and bearings which are located above the spray pattern generated by the discharge from the pump shaft.

The additional spray line used in the quadruple reduction units is copper tubing with sweat fittings.

In sizes 8 thru 10 of type VS and VL units, the bearings used in the high speed assemblies having an overhung pinion are grease lubricated thru a grease fitting. The bearings used in the high speed assemblies having a straddle mounted pinion are spray lubricated by the force-feed lubrication system.

In vertical sizes 8 thru 10, a dry well construction is used to seal the low speed output shaft which extends vertically downward. The dry well consists of a tube concentric with the shaft, extending above the oil level and covered by an umbrella to prevent oil leakage. The umbrella is installed on the shaft with a press fit and rotates with the low speed shaft gear.

Because of the use of the dry well around the low speed output shaft, lubricant from the force-feed lubrication system does not reach the low speed shaft outboard bearing. This bearing is grease lubricated thru a grease fitting on the side of unit.

SPECIAL LUBRICATION ARRANGEMENTS — Special lubrication arrangements may be furnished in vertical series units having any of the following service operating conditions:

1. Input speeds are lower than standard speeds.

2. Unit is not mounted with output shaft vertically down.

3. Service is intermittent and does not allow pump to adequately distribute the oil.

In these instances, a motor driven pump may be supplied or units may be filled with oil to submerge gears and bearings. If unit is filled with oil, special shaft seals may be used.

NOTE: OVER FILLING GEAR UNITS WITH OIL WILL CAUSE LEAKAGE.

HANDLING INSTRUCTIONS

SAFETY—In the maintenance and operation of gear drives, SAFETY COMES FIRST. By using the proper clothes, tools and methods of handling, serious accidents can be prevented.

This manual lists a number of safety precautions. Follow them, and insist that those working for you do the same. An accident is usually caused by neglect or oversight.

HANDLING—When handling the Philadelphia Gear drives, care must be taken to avoid supporting or lifting in a manner that would place excessive stress on parts that are not designed to support the unit weight. DO NOT attempt to lift a utility unit with any portion of lifting rope or sling attached to motor or scoop. When the gear drive is resting on the floor it always should be in a normal upright position with the weight resting on the mounting surface. Gear drives of the vertical type, having shafts projecting below the mounting base, should be supported by blocks under the mounting surfaces to avoid placing the unit weight on the shaft.

The unit should be lifted only with the heavy lifting lugs or eyebolts provided in the gear unit housing for this purpose. The horizontal units should be lifted only with the eyebolt in top of gear unit housing. Vertical units should be lifted only with lifting lugs located near top of gear unit housing. When more than one lifting lug or eyebolt is provided, slings should be used to distribute the load evenly.

NEVER ATTEMPT TO LIFT THE UNIT BY LIGHT EYEBOLTS FIXED INTO MOTORS FOR HANDLING MOTORS ONLY.

The following additional precautions should be observed in handling Philadelphia Gear drives.

1. Never drag the unit. This will mar the machined mounting surfaces and may over-stress the housing.
2. When attaching slings to the gear drive, attention should be given to the behavior of the sling under load. Do not attach a sling in a manner which will cause it to crush or rip loose any externally mounted equipment.

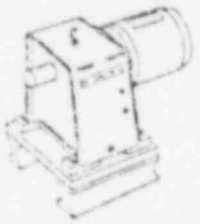
INSTALLATION INSTRUCTIONS

The basic gear drive is shipped from the factory completely assembled. Mating gears and pinions are carefully assembled at the factory to provide proper tooth contact. Nothing should be done to disturb this setting.

A SOLID FOUNDATION—The gear drive foundation should be rigid enough to maintain correct alignment with connected machinery. The foundation should have a flat mounting surface in order to assure uniform support for the unit. If unit is mounted on a surface which is other than horizontal, consult factory to insure that design provides for proper tooth contact and adequate lubrication.

Design of fabricated pedestals or base plates for mounting gear drives should be carefully analyzed to determine that they are sufficiently rigid to withstand operating vibrations. Vibration dampening materials may be used under the baseplate to minimize the effect of vibrations.

When mounting a drive on structural steel, the use of a rigid baseplate is strongly recommended. Bolt unit and baseplate securely to steel supports with proper shimming to insure a level surface.



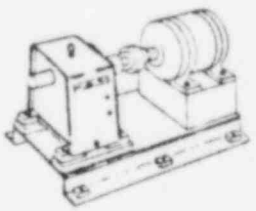
If a drive is mounted on a concrete foundation, allow the concrete to set firmly before bolting down the unit. For the best mounting, grout steel mounting pads into the concrete base, rather than grouting the gear unit directly into the concrete.

If an oversize motor or a motor with mounted accessories (clutch, brake, tachometer, etc.) is mounted on the scoop of a horizontal utility gear unit, a customer supplied support must be placed under the motor scoop.

If unit is equipped with adjustable slide bases, the slide bases must be mounted and leveled on the foundation as recommended above for the gear drive. Lateral adjustment of the gearmotor is accomplished by the long adjustment screws in the slide rails when V belt or chain drive is used.

LEVELING—If shims are employed to level or align the unit or slide base they should be distributed evenly around the base under all mounting pads to equalize the support load, to avoid distortion of the housing and highly localized stresses.

Use a feeler gauge to determine thickness of required shims. All pads must be squarely supported to prevent distortion of the housing when the unit is bolted down.



ALIGNMENT—If equipment is received mounted on a base plate or with a scoop mounted motor, it has been aligned at the factory. However, it may have become misaligned in transit. During field mounting of the complete assembly, it is always necessary to check alignment by breaking the coupling connection and shimming the base plate under the mounting pads, or in the case of scoop mounted motor, by shimming between motor pads and scoop until the equipment is properly aligned. On units that require a support under the motor scoop, the support must be installed under scoop and securely bolted in place along with the gear unit before final motor-to-gear drive alignment is made. (Couplings must be aligned such that the angular alignment and parallel alignments are each within .003 inch T.I.R.) All bolting between base plate and foundation, or between motor and scoop must be pulled up tight. After satisfactory alignment is obtained, close up the coupling.

REMOVE SHIPPING COVERS—All protective shipping covers should be removed from the unit. Shaft extensions and outside machined surfaces are protected during shipment by an anti-rust compound. This can be removed by using a solvent.

MOUNTING ACCESSORIES — Any field mounted couplings, sprockets, pinions, pulley, etc., should be installed carefully to provide good contact on the driving keys, as well as to prevent cocking on shaft extensions. Since an endwise blow on the shaft may damage gears and bearings, these attachments should not be hammered into position but, preferably, should be heated to about 375 degrees F. and slipped onto shafts.

Sprockets, pulleys, and pinions should be mounted as close as possible to the gear housing in order to reduce the cantilever effect of these overhung loads on adjacent bearings.

COUPLINGS—Drive shafts should be connected to shafts mounted on bearings using flexible couplings. The couplings should be aligned as closely as possible. Solid flanged couplings may be used for connecting to shafts not mounted in bearings or supported by a single self aligning bearing provided that any resulting thrust or overhung loads do not exceed unit rating.

ALIGNMENT AND BOLTING—The gear drive and the driven machine should be correctly aligned. (For in-line units, the gear drive together with the prime mover and the driven machine should be correctly aligned.)

After precise alignment, each member must be securely bolted and dowelled in place. Both angular and parallel alignment must each be within .003 inch T.I.R. If gear drive is equipped with adjustable slide bases, lateral adjustment of the gearmotor must be performed.

It is essential that a gear unit be securely bolted down to its foundation, utilizing bolts of the proper diameter to suit mounting holes. Bolts should be S.A.E. Grade 5 or equivalent. Shear blocks are recommended if unit has a heavy overhung load in a direction that would place the bolts in shear.

Approximate torque values for bolting are as follows:

Bolt Size Inches	Foot-Pounds Torque Values	Bolt Size Inches	Foot-Pounds Torque Values
½	50	1	400
⅝	100	1¼	830
¾	165	1½	1350
⅞	265		

After start-up (See Start-Up Instructions) the unit should be run until the operating temperatures stabilize. The alignment should be checked again and any necessary corrections made. IT IS GOOD PRACTICE TO CHECK THE ALIGNMENT ONCE MORE AFTER OPERATING UNDER LOAD FOR TWO OR THREE WEEKS.

CHECK ACCESSORIES—Those Philadelphia Gear units that are equipped with an electric motor driven lube pump or electric control devices should be wired and checked for correct operation of these accessories.

Units with water cooled heat exchangers should be piped to the cooling water lines and correct flow of coolant observed. For installations where lubrication is supplied from the customer's own central lubrication system, the unit should be piped to this system and before

unit start up, checked to insure that the system is furnishing oil in adequate volume and pressure to gearing and bearings.

BACKSTOPS—Units equipped with backstops are shipped from the factory with the backstop installed. Before start-up, turn output shaft by hand to check rotation. If rotation is incorrect, backstop must be reversed.

To reverse backstop in units equipped with an external backstop mounted on the high speed shaft, remove backstop and backstop adapter plate, and switch backstop adapter plate to opposite side of backstop. Remount backstop and backstop adapter plate on shaft with adapter plate in original position.

To reverse backstop in units equipped with an internal backstop mounted on the high speed shaft, drain oil from unit and then remove backstop housing and high speed shaft assembly. Unbolt retainer plate on inboard end of adapter (remove pinion if necessary). Tape shaft keyway to avoid damaging oil seal, and remove shaft with inboard bearing attached from adapter. Turn shaft slowly as it is being removed to avoid damage to backstop. Note direction of arrow stamped on backstop. Remove snap ring, backstop, key, spacers and outboard bearing. Reverse backstop and mount on shaft with spacers and outboard bearing. Install in housing with key and snap ring. Complete assembly of high speed shaft in backstop housing and mount on unit.

RUST PREVENTION—When the Philadelphia Gear drive leaves the factory, the internal parts are protected with a film of polar type rust preventative which protects the unit during shipment. This film is soluble in a lubricant, and does not have to be flushed out before filling with the recommended lubricant.

PROLONGED STORAGE—If installation of the gear drive and its operation are to be delayed for more than one month after factory shipment, special rust preventative precautions should be taken. The precautions may be taken by the factory if full information concerning storage conditions is provided at the time of ordering or, alternately, by the user in the field. Manufacturer's warranty on units held in prolonged storage should be covered by a special agreement reflecting the storage conditions.

If prolonged storage is necessary, it should be indoors, and preferably in a dry area having a relatively constant temperature.

When outdoor storage is unavoidable, units should be raised off the ground on skids and should be covered by a tarpaulin, or an equivalent protective covering.

Also, where possible, units should be filled to the top with oil or, where this is not possible, the interior and exposed metal parts should be sprayed with a heavy duty rust preventative. Gear drives should be periodically rotated while in storage.

ADD GREASE—Gear drives having bearings requiring grease are normally shipped from the Philadelphia Gear factory with grease in the bearings. Prior to prolonged storage or start-up, all grease lubricated bearings must be checked and grease added in accordance with instruc-

tions on Page 6.

START-UP INSTRUCTIONS

When starting up any new piece of equipment it is wise to proceed cautiously. Even though the best installation practices are followed, the possibilities of errors or omissions always exist. Therefore, before initial start-up, we recommend that those procedures in the following list which are applicable to your Philadelphia gear unit be followed.

1. Has motor coupling alignment been checked on all utility units shipped with a scoop mounted motor?
2. Has motor coupling been properly installed and aligned on utility units shipped without motor and on in-line units?
3. Has a support been properly installed under the scoop of horizontal utility units that have an oversize motor?
4. Have all pressure gauges, switches, etc., been mounted? Often it is necessary to box these items separately to prevent damage or loss in shipment.
5. Are mounting bolts tight? Check all external bolts, screws, accessories, etc., to make sure they have not loosened in shipping or handling.
6. Are all couplings, sprockets, pinions, etc., mounted on shaft extensions correctly with keys and fasteners in place?
7. Have couplings, seals, and bearings been greased?
8. Have coupling connections been made and tightened properly?
9. Fill with oil to indicated level. Government regulations require that gear units be emptied of all oil prior to shipment. Before startup, the Philadelphia Gear drive must be filled with the type and grade of oil specified on Page 8.
10. Have all inspection covers on unit been closed and properly fastened?
11. Have required electrical connections been made?
12. Have required piping connections been made? Tighten all pipe connections to make sure they have not loosened in shipment or handling.
13. Has backstop rotation been checked?

Philadelphia Gear drives are test-run at the factory; however, during initial start-up the following procedures are recommended:

1. If unit is equipped with heaters for cold temperature operation, turn on heaters and allow oil temperature to rise to at least 40 degrees F.
2. If the unit is equipped with a separate motor driven oil pump, start pump motor and check visually through inspection covers that the lubrication is flowing to gearing and bearings and, also, that a pressure of 15 to 30 PSI at operating temperature is indicated on pressure gauges.
3. Similarly, if unit is equipped with a pump driven by rotation of main gear train, the unit should be checked immediately on start-up through the full range of operating speeds to determine that lubricant is flowing to gearing and bearings. Pressure gauges are not furnished on standard units; however, if unit is equipped with a pressure gauge, the gauge should indicate 15 to 30 PSI.
4. If unit is equipped with a water cooled heat exchanger, make sure that clean cooling water is flowing to oil cooler. Cooling water should not exceed 80 degrees F. on entry into cooler unless the cooler was selected by manufacturer to permit higher water temperature.
5. To avoid damage to motor or prime mover used with in-line reducers or utility gearmotors having built-in backstops, break high speed coupling connection, turn unit by hand to check high speed shaft rotation. Operate motor to observe shaft rotation, reversing leads if necessary. Integral gearmotors should be started very carefully with output shaft coupling disconnected. Shut down immediately if output shaft does not turn. Reverse leads and test again.
6. Start unit slowly under as light a load as possible. If rotation of unit is limited to one direction only, a tag on the bearing block will indicate direction of rotation. Make certain that direction of shaft rotation is as shown on tag. If necessary, reverse electrical leads on motor to make shaft rotation conform to those shown.
7. Some special units are designed to have unrestricted oil flow from the pump thus permitting the lubricant to cascade freely over gears and bearings. Normally this type of lubrication arrangement will indicate lower oil pressures at the gauge. Pressures down to 5 PSI are entirely satisfactory; however, when the pressure gauge indicates less than 15 PSI, a precautionary visual inspection should be made to insure an adequate flow of oil to gears and bearings. Whenever oil pressures register below 15 PSI, it is good practice to determine from factory if this condition provides satisfactory lubrication.
8. Prime mover electrical starting equipment should be arranged to start unit slowly to avoid severe impact loads. Across the line starting of motors should be applied with caution to prevent instantaneous gear loads greatly in excess of rating.
9. As unit is brought up to normal operating speed, it should be checked constantly for unusual sounds, excessive vibration, excessive heat or oil leakage. If any of these develop, the unit should be shutdown immediately and the cause determined and corrected. Operating temperature of the unit at the hottest point should normally not exceed 180 degrees F.
10. If possible, the unit should be operated under a light load (approximately half-load) for one or two days to allow final breaking-in of gears. After this period, the unit can be operated under normal load.

LUBRICATION INSTRUCTIONS

TYPE OF LUBRICANT — The recommended types of oil for use in Philadelphia Gear drives are either straight mineral oil or extreme pressure (EP) oil. Specifications and recommended areas of application for both types of lubricant are shown on Page 8. EP OILS ARE NOT TO BE USED IN UNITS EQUIPPED WITH A BUILT-IN BACKSTOP. HOWEVER, EP OILS CAN BE USED IN UNITS HAVING AN EXTERNAL BACKSTOP PROVIDING THE EP OIL IS NOT USED IN THE BACKSTOP.

LOW TEMPERATURE OPERATION—The Philadelphia Gear factory should be fully advised of low temperature service conditions at the time an enclosed gear drive is purchased, in order that special design considerations can be incorporated.

Oil temperatures increase during op-

eration; therefore, the oil selected must have the viscosity required at unit operating temperatures. Minimum viscosity under operating conditions should range from 150 to 400 SUV.

The oils recommended in the Selection Chart on Page 8 are not normally satisfactory for cold temperature starting. When ambient starting and operating temperatures range below the minimum specified in the following paragraph for low temperature environments, heaters or special oils must be used. Refer to the factory for recommendations.

The lubrication recommendations on Page 8 are suitable for splash systems starting and operating to 15 degrees F. Whenever a pump is used in a spray lubrication system, these recommendations should only be applied to 40 degrees F. When ambient temperatures fall below this level, either heaters or special lubricants must be used to assure adequate pump action.

GREASE LUBRICATION OF BEARINGS—Pressure fittings are supplied on the vertical type units for the application of grease to bearings that are shielded from the oil. Although a film of grease over the rollers and races of the bearing is sufficient lubrication, Philadelphia Drives are designed with ample reservoirs at each grease point.

Grease chambers should be filled through pressure fittings until grease flows out of relief plugs.

Unit is shipped from the factory with grease applied; however, it is always advisable to add grease in the event the original grease might have been dissipated. Couplings, and all accessory equipment should be checked for adequate grease supply.

Greased bearings should be lubricated at definite intervals. Usually one month intervals are satisfactory unless experience indicates that regreasing should occur at shorter or longer intervals.

OIL SEALS—Oil seals require a small amount of lubricant to prevent frictional heat and subsequent destruction when the shaft is rotating. Normally when a single seal is utilized, sufficient lubricant is provided by spray or splash. Oil seals and stuffing boxes often permit a slight seepage of oil past the sealing surfaces. This seepage is required to minimize seal friction and heat. Certain design or application requirements dictate that double seals be used at some sealing points. When this is the case, a grease fitting and relief plug are located in the seal retainer to provide lubricant to the outer seal. Grease must be applied periodically between the seals by pumping through fitting until overflow is noted at relief plug. The greases recommended for bearings may also be used for seals.

OIL CHANGES — After the initial two weeks of operation of a Philadelphia Gear unit, the first oil should be changed. If desired this oil may be strained and reused. Do not use a strainer finer than 75 micro inches to avoid filtering out the additives. Very often, due to the wearing-in process, small metal particles will show up in the oil; this is not abnormal.

It is recommended that the gear housing be thoroughly flushed out after the original oil has been drained. Fill the unit to the indicated level with SAE 10 straight mineral flushing oil which should not contain additives. Unit should be started, brought up to operating speed (preferably without load) and immediately shut down. Drain off flushing oil and refill with recommended operating lubricant to proper level. After the break-in procedure outlined above, it is recommended that oil be changed after each subsequent 2500 hours of operation or 6 months of normal operation, whichever occurs first.

Unusual environmental or load conditions sometimes necessitate replacement of oil as frequently as one to two month intervals—as determined by field inspection of oil. Special attention must be given to the inspection of lubricants when the following conditions exist.

1. High operating temperatures resulting from heavy intermittent loads, causing the temperature of the gear case to rise rapidly and then cool.
2. Ambient temperature conditions which might tend to cause sweating on the inside walls of the unit, thus contaminating oil and forming sludge.
3. Operating oil temperatures that remain constantly above 180 degrees F.
4. When the unit is exposed to unusually moist atmosphere or vapors.

Precautions should be taken to prevent any foreign matter from entering the gear housing. Dust, dirt, moisture and chemical fumes form sludge which is the biggest enemy of proper and adequate lubrication. Philadelphia Gear Corporation should be advised before manufacture of gear drive when unusual environmental conditions are anticipated.

PREVENTIVE MAINTENANCE

See Pages 8 and 9 for Trouble-Shoot-Chart.

The instructions for oil changes should be followed.

After the first 50 hours of operation all external housing and hold-down bolts should be torqued to make certain they have not loosened. Piping connections should be checked and tightened if necessary.

It is good practice to recheck the alignment with connecting machinery after initially operating for two or three weeks under load.

DAILY—The Philadelphia unit should be given a routine visual inspection for oil leaks or unusual sounds. If either occurs, unit should be shutdown at once and the cause determined. If the unit is equipped with pressure lubrication, the oil pressure should be checked. If any change from previous reading is noted, the cause should be immediately determined.

WEEKLY—Check oil level. Add oil if necessary.

MONTHLY—Add grease at all bearings, couplings, and seals. If the unit is equipped with pressure lubrication having an external filter, turn handle on filter two or three times to clear filter elements.

AT TWO MONTH INTERVALS—Check oil for contamination. Check grease for contamination. On units equipped with pressure lubrication systems having an external filter, clean out oil filter by removing bottom plug and flushing out filter elements. Check operation of all gauges, alarm systems, controls, etc.

AT SIX MONTH or 2500 HOUR INTERVALS—Change oil.

If unit is equipped with a backstop on high speed shaft, before filling unit with lubricant check backstop for movement. Break coupling connections at high speed and low speed shafts and attempt to turn high speed shaft in a reverse direction. If there is any movement, the backstop should be removed and checked for worn or damaged sprags or worn shaft race.

Change grease at bearings, couplings, and seals. On units having an external oil cooler, check condition of cooler tubes for build-up of sediment or other deposits from coolant water. Clean these members if necessary.

EXTENDED SHUTDOWN PERIODS—If it becomes necessary to shutdown for a period longer than one week, the unit must be run for at least ten minutes during each week that it is idle. This periodic operation will keep the gears and bearings coated with oil and will prevent rusting due to condensation of moisture resulting from temperature changes.

TIPS FOR DISASSEMBLY

NOTE: The Seller's Gearmotor, Motoreducer, or In-Line Reducer Warranty shall be voided if User disassembles unit at any time during the Warranty Period without the expressed permission of the Seller or without the supervision of a Philadelphia Gear Corporation Service Department Representative.

Never perform any work on the gear drive or couplings until absolutely certain that the prime mover cannot be remotely or automatically started. Clean up area around unit before disassembly to keep parts clean and to keep them in proper order for reassembly. Keep in mind that parts usually go back together in reverse order of disassembly, and also note any match marks which might similarly affect reassembly. Provide wooden blocks or skids for storing machined parts in order to prevent damage to machined surfaces.

Before starting disassembly, carefully review typical parts list or assembly drawing of unit.

Disconnect unit completely from driving and driven machinery to avoid any possibility of accidental rotation.

Disconnect electrical connections to motor on gearmotor.

Drain oil from housing by removing pipe plug at main drain.

Remove caps, being careful to avoid damaging gaskets. When removing caps having thru shafts, tape shaft extension keyways and other sharp edges to avoid damaging oil seals.

All internal capscrews have Loctite applied to threads—it may be necessary to heat capscrews slightly to break capscrew free for easy removal.

To remove pinions from shafts other than the motor shaft, it may be necessary to heat shafts sufficiently to liquify "Loctite." When removing pinion from motor shaft it may be necessary to cut shrink ring to remove it from shaft. Install new shrink ring when unit is reassembled.

To remove gears from shafts it may be necessary to apply heat to gears to relieve shrink fit holding it to shaft. Heat

should be applied to sides of gear on a diameter 1 to 2 inches larger than bore. Heat should not exceed 500 degrees F. and should not be applied directly to shaft.

Backstops can be removed from unit as described on page 5.

INTEGRAL GEARMOTORS—The general disassembly instructions for the majority of integral gearmotors are as follows:

1. Remove unit from foundation and place on wooden skids or blocks of sufficient height to allow low speed output shaft to extend vertically downward.

2. Unbolt and remove motor and attached pinion.

3. Unbolt and remove motor adapter plate. (On quadruple reduction units, first intermediate speed shaft will come away with motor adapter plate.)

4. SINGLE REDUCTION HORIZONTAL UNITS—Remove low speed output shaft. If tapered roller bearings are used, remove low speed gear, bearing plate and then pull shaft free of housing. If ball bearings are used, remove snap ring and pull shaft free of housing.

5. DOUBLE REDUCTION UNITS — Unbolt and remove bearing plate. (In vertical units equipped with pump, pump gear and bearing snap ring must be removed before bearing plate can be removed.) Intermediate speed shaft will come away with bearing plate. Remove low speed output shaft from housing. To remove pump assembly and pump shaft from housing of vertical units equipped with a pump, remove pump cap and pull pump and pump shaft from unit.

6. TRIPLE REDUCTION UNITS — Same as double reduction units except that first intermediate shaft will come away with bearing plate. Remove low speed and second intermediate speed shafts from housing. To remove pump assembly and pump shaft from housing of vertical units equipped with a pump, remove pump cap and pull pump and pump shaft from unit.

7. QUADRUPLE REDUCTION UNITS —Unbolt and remove first intermediate speed bearing plate from motor adapter and pull bearing plate from shaft. Remove remaining bearing plate. (In vertical units equipped with a pump, pump gear and bearing snap ring must be removed before bearing plate can be removed.) Second intermediate speed shaft will come away with bearing plate. Remove low speed shaft and third intermediate speed shaft from housing. To remove pump assembly and pump shaft from housing of units equipped with a pump, remove pump cap and pull pump and pump shaft from unit.

UTILITY GEARMOTORS AND IN-LINE REDUCERS—The disassembly tips for the utility (horizontal and vertical) gearmotors and in-line reducers follow the general disassembly instructions for equivalent reduction, integral gear drives, but with the following additional instructions.

1. Cut capscrew tackwelds and unbolt motor. (In-line reducers do not have scoops.)

2. Remove coupling half from gear drive high speed input shaft.

3. Remove housing cover. The high speed input assembly of all units as well as the first intermediate speed shaft assembly of the quadruple reduction units are removed with the housing cover. After housing cover is unbolted on units having a high speed thru cap, remove two socket head shoulder screws from cover and slide housing cover toward side of unit where breather is located. This allows the high speed assembly inboard bearing block to clear the gear with which the high speed pinion meshes and allows the housing cover to be lifted off.

4. In quadruple reduction units only, unbolt and remove first intermediate speed bearing plate from housing cover. Remove first intermediate speed assembly.

5. Unbolt and remove bearing retainer plate for ball bearings, or thru cap for tapered roller bearings from high speed input assembly.

6. Remove high speed assembly.

TIPS FOR ASSEMBLY

Clean all parts thoroughly before assembly. Examine components carefully for defects or signs of wear. Replace if necessary.

Apply Loctite to threads of all internal capscrews. Use Grade 242 on threads of capscrews ¾ inch diameter and smaller; and Grade 271 on threads of capscrews over ¾ inch diameter.

Before reassembling gears on shafts, make certain gear hand of cut (helix) is arranged in the same position as before disassembly. If gear has a chamfer on one end of bore only, this end must go against shaft shoulder. When pressing gear on shaft, check with indicator to determine that gear is square with shaft journals. Gear must be seated firmly against the shaft shoulder.

Gears must be mounted with a shrink fit. Gear bore and shaft seat must be clean, dry and free from all grease, oil or other contaminants. Heat gears to a temperature 400 degrees F. above ambient before mounting. DO NOT USE ANY TYPE OF LUBRICANT ON SHAFT DURING MOUNTING.

Pinions which are held in place by snap rings are mounted with a slip fit or light press fit and Loctite Retaining Compound No. 75. Pinion bore and shaft seat must be clean, dry and free from all grease, oil or other contaminants. If pinion is heated, DO NOT apply Loctite to pinion bore, apply to shaft seat only. Pinion must be mounted quickly since heat will cause Loctite to set rapidly. If pinion is not heated, apply Loctite to pinion bore and shaft seat. If pinion is heated, heat to a temperature 300 degrees F. above ambient before mounting.

Bearings can easily be assembled on shafts if they are first heated to approximately 250 degrees F. If bearings have bakelite ball or roller retainers, they should not be heated but, instead, should be pressed on shaft under ambient temperature conditions. Bearings must not be cocked and should be held against shaft shoulder while cooling. This can be readily accomplished by holding shaft vertically and dropping on bearing. After cooling, carefully tap inner race of bearing against shoulder with bar and hammer. Any bearing locknuts or retainer plates should be taken up until snug against bearing.

Bearing adjustments should be made as recommended in General Design Features, Pages 2 and 3. Correct bearing adjustment of opposed tapered roller bearings held in place by bearing plates can be obtained by the following procedure. (If a new part is being installed that may affect lateral end play, a new shim pack should be ordered at time part is ordered.)

1. Position low speed shaft and low speed pinion and shaft in housing.

2. Install and secure bearing plate with original shims in place.

3. Check shafts for bearing adjustment. Shafts should have .001 to .005 inch lateral end play and should turn freely.

4. If lateral end play of either shaft exceeds .005 inch, remove bearing plate and add a .005 inch shim to appropriate bearing bore in bearing plate. Replace bearing plate and recheck end play.

5. If shaft assemblies do not turn freely, determine which shaft assembly has no end play. Remove bearing plate and remove a .005 shim from appropriate bearing bore in bearing plate. Replace bearing plate and recheck end play.

Correct bearing adjustment of opposed tapered roller bearings on output shaft of units having a low speed bearing cap can be obtained by the following procedure.

1. Position low speed shaft in housing and install bearing plate.

2. Mount low speed bearing cap. Tighten mounting bolts until bearings are snug but turn freely.

3. Measure with feeler gauge the gap between cap flange and housing boss, and add the specified amount (.002 to .004 inch) of lateral end play.

4. Insert shim of thickness equivalent to dimension obtained in step 3.

Correct bearing adjustment of opposed tapered roller bearings held in place by locknuts can be obtained by adjusting locknut for .002 to .004 inch lateral end play of respective shaft.

Clean housing and cover plate surfaces thoroughly and apply a thin film of liquid sealing compound (Black Permatex No. 2 or an equal is recommended). Before installing and fastening cover plate housing, all connecting oil passages must be correctly lined up, as well as all dowel pin holes or bearing pin holes. When installing caps, be certain that any oil passages are correctly lined up with passage in housing.

Tape shaft extension keyways before installing oil seals to avoid damaging seals.

Install backstop as described on Page 5.

AGMA OIL NUMBER SELECTION CHART

FOR PHILADELPHIA GEARMOTORS, MOTOREDUCERS AND IN-LINE REDUCERS (See Note 1)

CONTACT YOUR SUPPLIER FOR TRADE NAME OF LUBRICANT MEETING THESE SPECIFICATIONS

TYPE OF OIL		AMBIENT TEMPERATURE (°F)	
		15-60	50-125
STRAIGHT MINERAL OIL	AGMA NUMBER	2	4
	VISCOSITY RANGE	280-300 SUV @ 100°F	700-1000 SUV @ 100°F
EXTREME PRESSURE OIL	AGMA NUMBER	2EP	4EP
	VISCOSITY RANGE	280-400 SUV @ 100°F	700-1000 SUV @ 100°F

NOTE 1. THESE RECOMMENDATIONS ARE TO BE USED FOR NORMAL INDUSTRIAL SPEED RANGES (SHAFTS NOT EXCEEDING 3600 RPM OR PITCH LINE VELOCITIES NOT EXCEEDING 5000 FEET PER MINUTE). THESE RECOMMENDATIONS ARE NOT TO BE USED FOR GEAR DRIVES OPERATING AT HIGHER SPEEDS. CONSULT FACTORY FOR LUBRICATION RECOMMENDATIONS FOR HIGHER SPEEDS.

NOTE 2. For splash lubrication the oils listed above are suitable for start up temperatures as low as 15° F. However, in units where a pump supplies forced feed lubrication, the above lubricants should only be used for start up to 40 F. Below 40°F. heaters should be used to preheat oil before starting, or suitable special oils utilized. For other low temperature starting and operating recommendations, see Page 5.

TYPES OF LUBRICANT

1. The recommended types of oil for use in Philadelphia Gear units are either straight mineral oil or extreme pressure (EP) oil of specifications shown above. In general, the straight mineral oil should be a high grade, well refined petroleum oil within the recommended viscosity range. It must be neutral in reaction and must not be corrosive to gears and ball or roller bearings. It should have good defoaming properties and good resistance to oxidation for high operating temperatures.

Philadelphia units that are subjected to heavy shock, impact loading, or extremely heavy duty, should use an extreme pressure (EP) lubricant. Extreme pressure (EP) gear lubricants are petroleum based lubricants containing special chemical additives. EP lubricants recommended are those containing either lead naphthanate or sulfur-phosphorous additives. Sulfur-phosphorous type EP oils are generally more stable than lead naphthanate type oils and may be used to a maximum sump temperature of 180°F. Limit lead naphthanate EP oils to a maximum sump temperature of 160°F.

DO NOT USE EP OILS IN UNITS EQUIPPED WITH BUILT-IN BACKSTOPS OR IN AN EXTERNAL BACKSTOP.

IN GENERAL, IF UNITS ARE SUBJECTED TO UNUSUALLY HIGH AMBIENT TEMPERATURES (110°F. OR OVER), EXTREME HUMIDITY OR ATMOSPHERIC CONTAMINANTS, USE THE STRAIGHT MINERAL OIL RECOMMENDED.

GREASE LUBRICATION

Lubricants should be high grade, non-separating, ball bearing grease suitable for operating temperatures to +150 degrees F. Grease to be N.L.G.I. Number 2 consistency.

Grease lubricants must be non-corrosive to ball or roller bearings, and must be neutral in reaction. It should contain no grit, abrasive, or fillers; should not precipitate sediment; should not separate at temperatures up to 300 degrees F.; and should have moisture resistant characteristics. The lubricant must also have good resistance to oxidation.

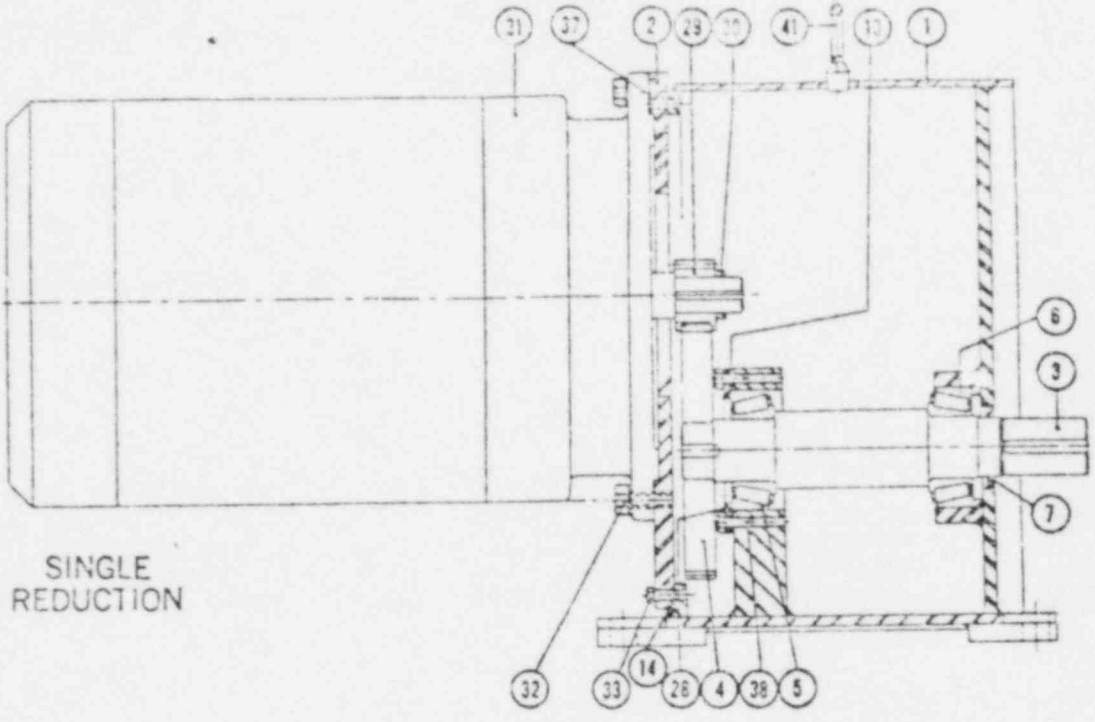
TROUBLE SHOOTING CHART

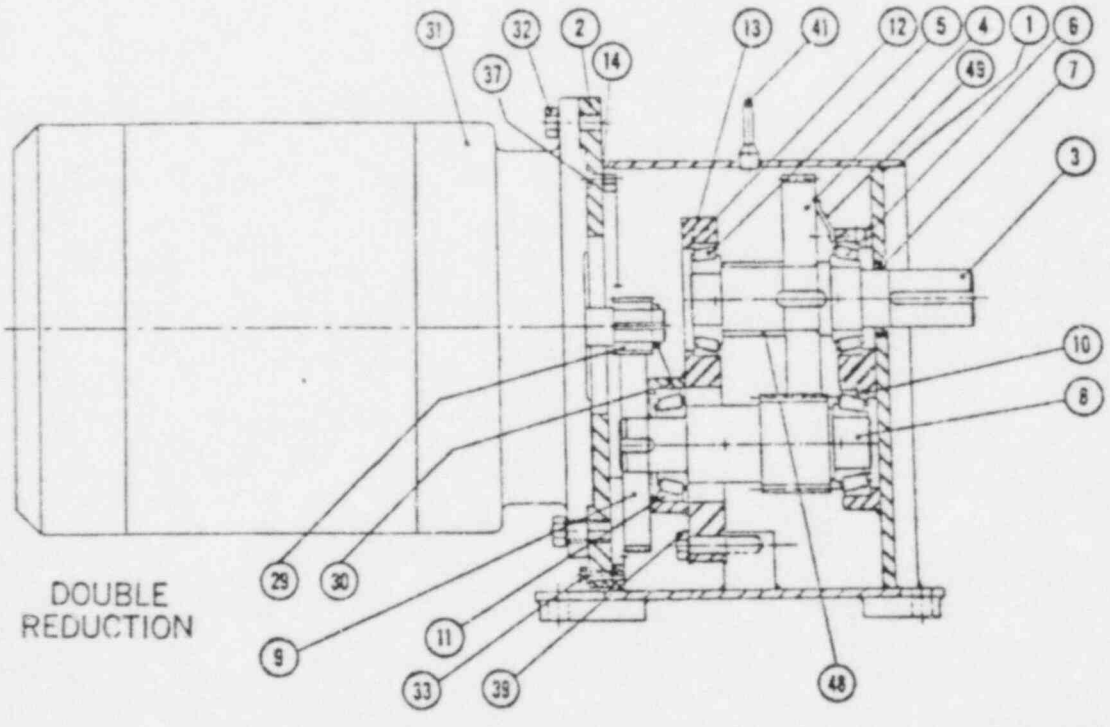
TROUBLE	WHAT TO INSPECT	ACTION
Overheating	1. Unit overloaded.	Reduce the loading or replace with drive of sufficient capacity.
	2. Oil cooler operation.	Check coolant and oil flow. Vent system of air. Oil temperatures into unit should be approximately 110 degrees F. Check cooler internally for build up of deposits from coolant water.
	3. Has recommended oil level been exceeded or is level too low?	Check oil level indicator to see that housing is accurately filled with lubricant to the specified level.
	4. Are bearings properly adjusted?	Bearings must not be pinched. Adjustable tapered bearings must be set at proper bearing lateral clearance. All shafts should spin freely when disconnected from load.
	5. Oil seals or stuffing box.	Oil seals should be greased on those units having grease fitting for this purpose. Otherwise, apply small quantity of oil externally at the lip until the seal is run in. Stuffing box should be gradually tightened to avoid overheating. Packing should be a self-lubricating, braided asbestos type.
	6. Breather.	Breather should be open and clean. Clean breather regularly in a solvent.
	7. Grade of oil.	Oil must be of grade specified in lubrication instructions. If it is not, clean unit and refill with correct grade.
	8. Condition of oil.	Check to see if oil is oxidized, dirty, or of high sludge content, change oil and clean filter.
	9. Forced feed lubrication system.	Make sure oil pump is functioning. Check that oil passages are clear and permit free flow of lubricant. Inspect oil line pressure regulators, nozzles and filters to be sure they are free of obstructions. Make sure pump suction is not sucking air.
	10. Coupling alignment.	Disconnect couplings and check alignment. Realign as required.
	11. Coupling lateral float.	Adjust spacing between drive motor, etc., to eliminate end pressure on shafts. Replace flexible coupling with type allowing required lateral float.
	12. Speed of unit excessive?	Reduce speed or replace with drive suitable for speed.
Shaft Failure	1. Type of coupling used.	Rigid couplings between rigidly supported shafts can cause shaft failure. Replace with coupling to provide required flexibility and lateral float.
	2. Coupling alignment.	Realign equipment as required.
	3. Is overhung load excessive?	Reduce overhung load. Use outboard bearing or replace with unit having sufficient capacity.
	4. Is unit overloaded?	Reduce the loading or replace with drive of sufficient capacity.
	5. Is unit subjected to high energy loads or extreme repetitive shocks?	Apply couplings capable of absorbing shocks and if necessary, replace with drive of sufficient capacity to withstand shock loads.
	6. Torsional or lateral vibration condition.	These vibrations can occur through a particular speed range. Reduce speed to at least 25% below critical speed. System mass-elastic characteristics can be adjusted to control critical speed location. If necessary, adjust coupling weight, as well as shaft stiffness, length and diameter. For specific recommendations contact factory.
	7. Is outboard bearing properly aligned?	Realign bearing as required.

TROUBLE SHOOTING CHART (Continued)

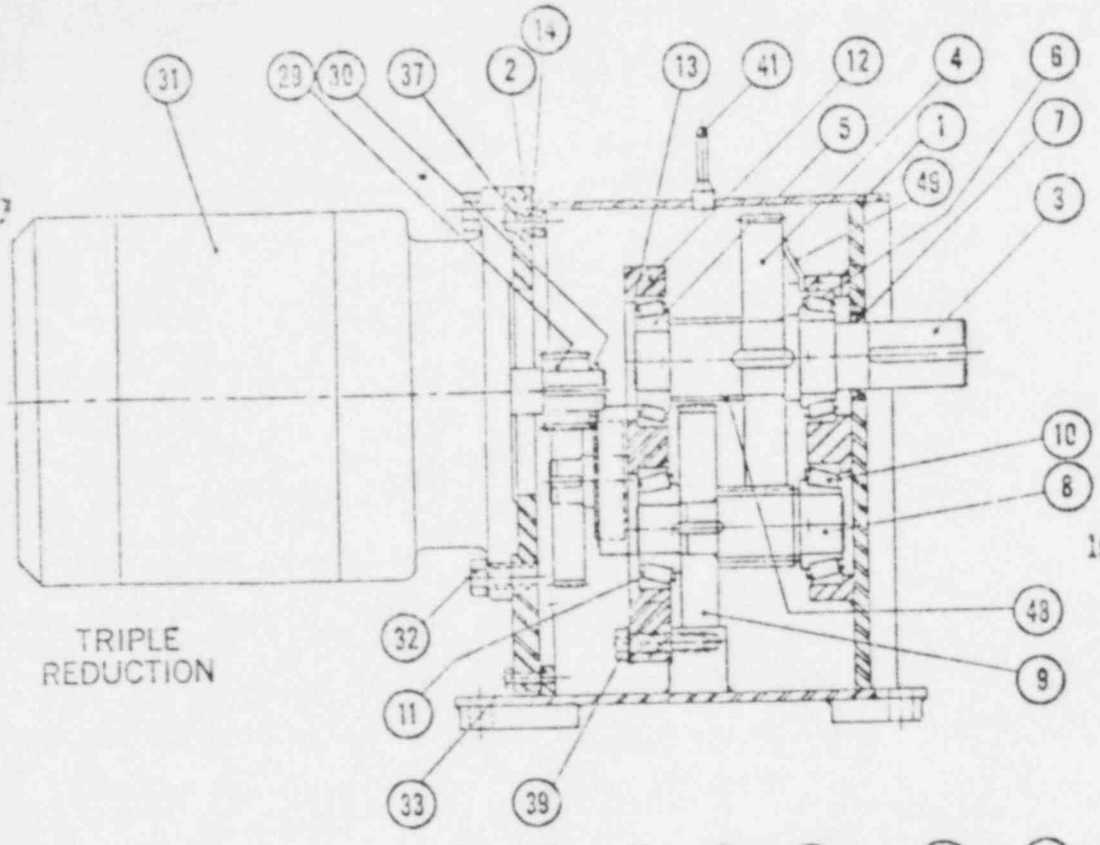
TROUBLE	WHAT TO INSPECT	ACTION
Bearing Failure	1. Is unit overloaded?	See—Overheating (Item 1). Abnormal loading results in flaking, cracks and fractures of the bearing.
	2. Is overhung load excessive?	See—Shaft Failures (Item 3).
	3. Speed of bearing excessive?	See—Overheating (Item 12).
	4. Coupling alignment.	See—Overheating (Item 10).
	5. Coupling lateral float.	See—Overheating (Item 11).
	6. Are bearings properly adjusted?	See—Overheating (Item 4). If bearing is too free or not scuba with axis—erratic wear pattern will appear in bearing races.
	7. Are bearings properly lubricated?	See—Overheating (Items 2, 3, 7, 8, 9). Improper lubrication causes excessive wear and discoloration of bearing.
	8. Rust formation due to entrance of water or humidity.	Make necessary provisions to prevent entrance of water. Use lubricant with good rust inhibiting properties. Make sure bearings are covered with sufficient lubricant. Turn over gear unit more frequently during prolonged shut down periods.
	9. Is bearing exposed to an abrasive substance?	Abrasive substance will cause excessive wear, evidenced by dulled balls, rollers, and raceways. Make necessary provision to prevent entrance of abrasive substance. Clean and flush drive throughly and add new oil.
	10. Has unit been stored improperly or damaged by prolonged shut-down?	Prolonged periods of storage in moist, ambient temperatures will cause destructive rusting of bearings and gears. When these conditions are found to have existed, the unit must be disassembled, inspected, and damaged parts either thoroughly cleaned of rust, or replaced.
Oil Leakage	1. Has recommended oil level been exceeded?	Check through level indicator that oil level is accurately at level indicated on housing.
	2. Is breather open?	Breather should be open and clean.
	3. Are all oil drains open?	Check that all oil drain locations are clean and permit free flow. Drains are normally drilled in the housing between bearings and bearing cap where shafts extend through caps.
	4. Oil seals	Check oil seals and replace if worn. Check condition of shaft under seal and polish if necessary. Slight leakage normal—required to minimize friction and heat.
	5. Stuffing boxes.	Adjust or replace packing. Tighten packing gradually to "break in". Check condition of shaft and polish if necessary.
	6. Force feed lubrication to bearing excessive?	Reduce flow of lubricant to bearing by adjusting orifices. Refer to factory.
	7. Plugs at drains, levels, etc., and standard pipe fittings.	Apply Marseal pipe joint sealant, or equal, and tighten fittings.
	8. Compression type pipe fittings.	Tighten fitting or disassemble and check that collar is properly gripping tube.
	9. Housing and caps.	Tighten cap screws or bolts. If not entirely effective, remove housing cover and caps. Clean mating surfaces and apply new sealing compound (Black Permatex No. 2 or equal). Reassemble. Check compression joints by tightening fasteners firmly.
Gear Wear	1. Gear tooth wear and failure.	Refer to factory.
	2. Backlash.	Gear set must be adjusted to give proper backlash. Refer to factory.
	3. Misalignment of Gears.	Check contact pattern to be over approximately 75% of face, preferably in center area. Check condition of bearings.
	4. Housing twisted or distorted?	Check shimming or stiffness of foundation.
	5. Is unit overloaded?	See—Overheating (Item 1).
	6. Has recommended oil level been maintained?	See—Overheating (Item 3).
	7. Are bearings properly adjusted?	See—Overheating (Item 4).
	8. Grade of oil.	See—Overheating (Item 7).
	9. Condition of oil.	See—Overheating (Item 8).
	10. Forced feed lubrication.	See—Overheating (Item 9).
	11. Coupling alignment.	See—Overheating (Item 10).
	12. Coupling lateral float.	See—Overheating (Item 11).
	13. Excessive speeds.	See—Overheating (Item 12).
	14. Torsional or lateral vibration condition.	See—Shaft Failure (Item 6).
	15. Rust formation due to entrance of water or humidity.	See—Bearing Failure (Item 8).
	16. Gears exposed to an abrasive substance.	See—Bearing Failure (Item 9).
Noise	1. Unusual or increasing noise.	See—Gear Wear (Items 1 thru 16) and Bearing Failure (Items 1 thru 8).

INTEGRAL GEARMOTOR--PARTS LIST

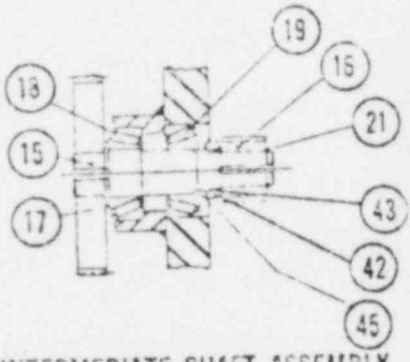




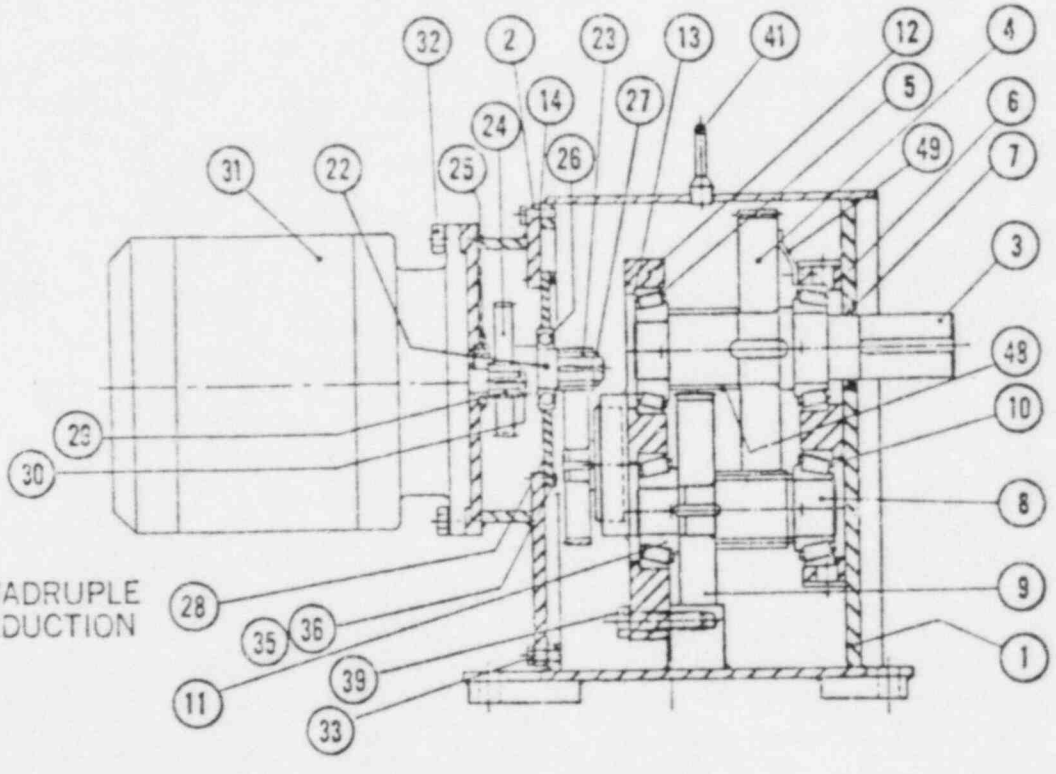
ITEM NO.	NAME	ITEM NO.	NAME	ITEM NO.	NAME
1	HOUSING	10	BEARING	19	BEARING
2	MOTOR ADAPTER	11	BEARING	20	SPACER *
3	L.S. SHAFT	12	BEARING PLATE	21	SNAP RING
4	L.S. GEAR	13	SHIM	22	INTERMEDIATE SHAFT
5	BEARING	14	GASKET	23	INTERMEDIATE PINION
6	BEARING	15	INTERMEDIATE SHAFT	24	INTERMEDIATE GEAR
7	OIL SEAL	16	INTERMEDIATE PINION	25	BEARING
8	L.S. PINION SHAFT	17	INTERMEDIATE GEAR	26	BEARING
9	INTERMEDIATE GEAR	18	BEARING	27	SNAP RING



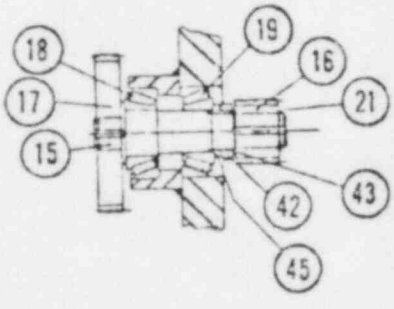
TRIPLE REDUCTION



1st INTERMEDIATE SHAFT ASSEMBLY



QUADRUPLE REDUCTION



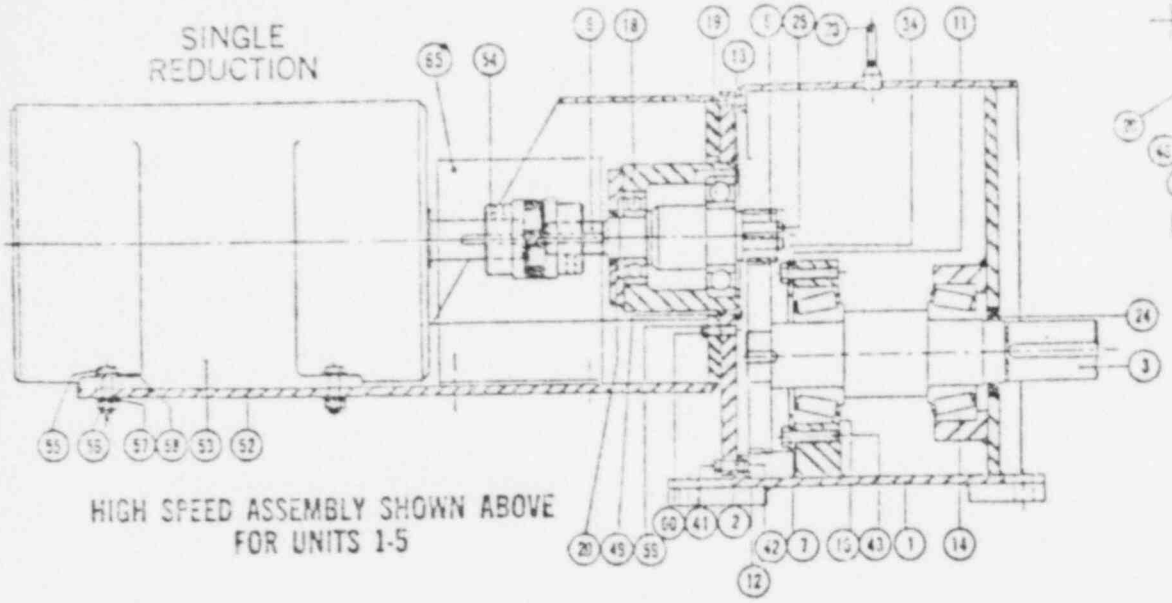
2nd INTERMEDIATE SHAFT ASSEMBLY

ITEM NO.	NAME	ITEM NO.	NAME	ITEM NO.	NAME
28	BEARING PLATE	36	BEARING PLATE DOWELS	45	KEY WASHER
29	H.S. PINION	37	SCREW	46	OIL FILL PLUG*
30	RETAINER	38	CAP SCREW	47	OIL DRAIN PLUG*
31	MOTOR	39	BEARING PLATE BOLTS	48	SPACER
32	MOTOR BOLTS	40	BEARING PLATE DOWELS*	49	SCRAPER
33	COVER BOLTS	41	EYE BOLT BREATHER		
34	COVER DOWELS*	42	LK. NUT & LK. WASHER		
35	BEARING PLATE BOLTS	43	RETAINING RING		

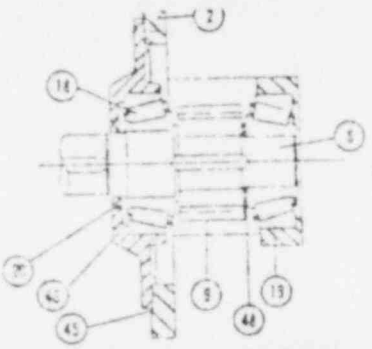
*NOT SHOWN

UTILITY GEARMOTOR AND HORIZONTAL IN-LINE REDUCER[1] — PARTS LIST

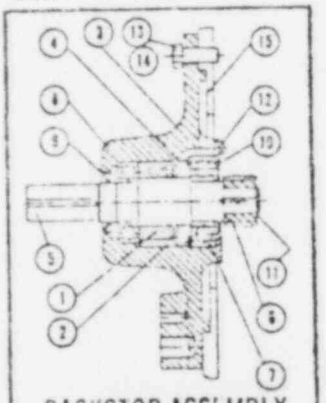
SINGLE REDUCTION



HIGH SPEED ASSEMBLY SHOWN ABOVE FOR UNITS 1-5



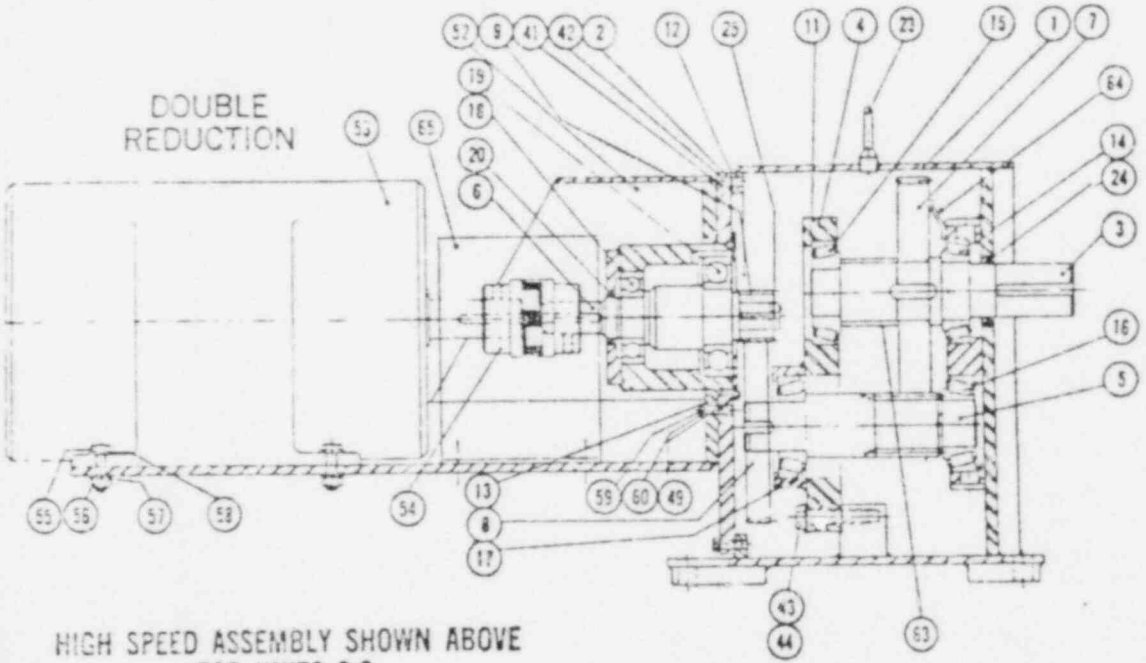
HIGH SPEED ASSEMBLY USED ON UNITS 6-9



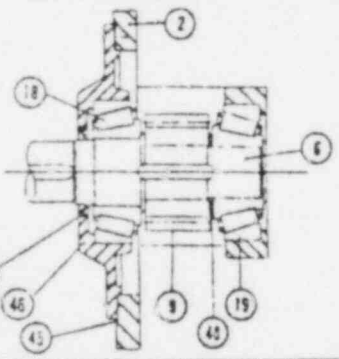
BACKSTOP ASSEMBLY

ITEM NO.	NAME
1	BACKSTOP
2	BACKSTOP KEY
3	BACKSTOP CARTRIDGE
4	RETAINER RING
5	H.S. SHAFT
6	H.S. PINION
7	BEARING
8	BEARING
9	OIL SEAL
10	BEARING RETAINER
11	SNAP RING
12	HEX BOLT
13	HEX BOLT
14	LOCKWASHER
15	ADAPTER

DOUBLE REDUCTION



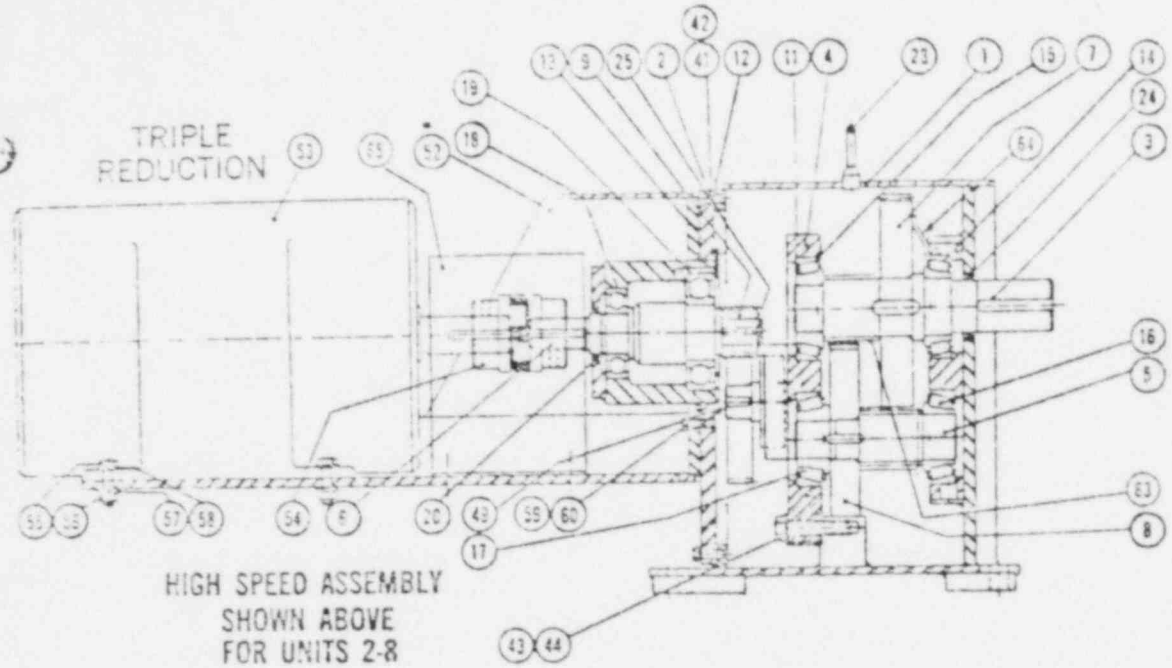
HIGH SPEED ASSEMBLY SHOWN ABOVE FOR UNITS 2-6



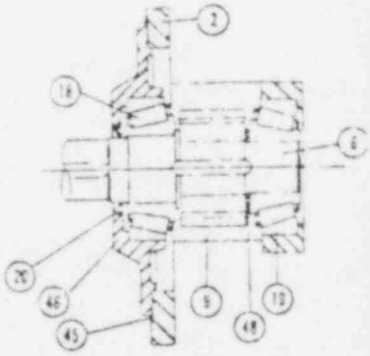
HIGH SPEED ASSEMBLY USED ON UNITS 7-10

[1] IN-LINE REDUCER SAME AS UTILITY UNIT WITHOUT MOTOR AND MOTOR SCOOP.

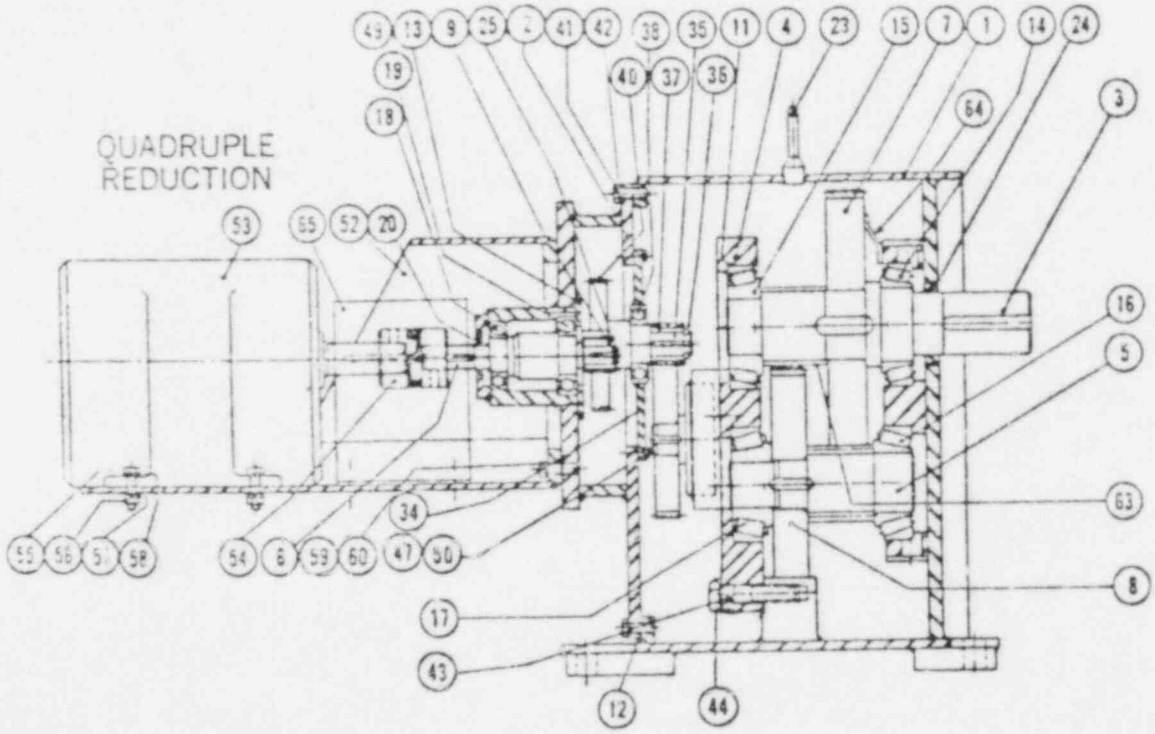
ITEM NO.	NAME	ITEM NO.	NAME	ITEM NO.	NAME
1	HOUSING	11	SHIM	23	EYE BOLT & BREATHER
2	HOUSING COVER	12	GASKET	24	OIL SEAL
3	L.S. SHAFT	13	BEARING RETAINER PLATE	25	SNAP RING
4	BEARING PLATE	14	BEARING	26	INTERMEDIATE SHAFT
5	L.S. PINION SHAFT	15	BEARING	27	INTERMEDIATE GEAR
6	INPUT SHAFT	16	BEARING	28	INTERMEDIATE PINION
7	L.S. GEAR	17	BEARING	29	BEARING
8	INTERMEDIATE GEAR	18	BEARING	30	BEARING
9	H.S. PINION	19	BEARING	31	SNAP RING
		20	OIL SEAL	34	BEARING PLATE

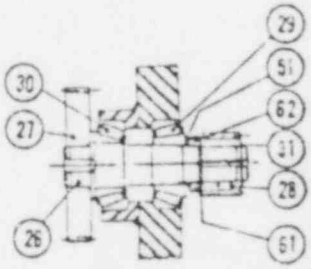


HIGH SPEED ASSEMBLY
SHOWN ABOVE
FOR UNITS 2-8



HIGH SPEED ASSEMBLY
USED ON UNITS 9-10





2nd INTERMEDIATE
SHAFT ASSEMBLY

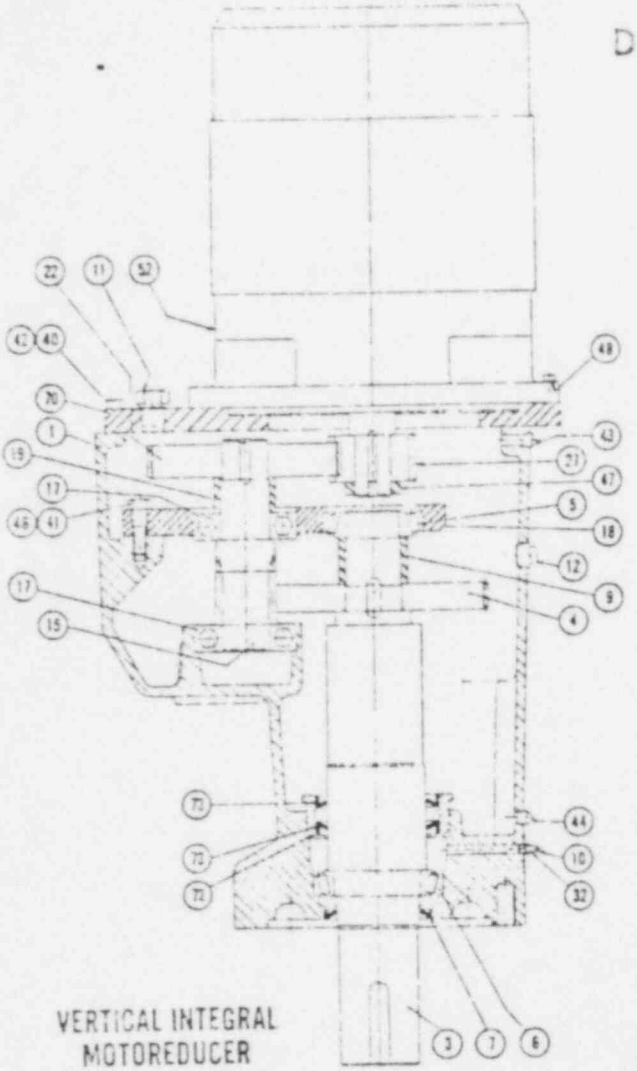
ITEM NO.	NAME	ITEM NO.	NAME	ITEM NO.	NAME
35	INTERMEDIATE SHAFT	45	GASKET	55	HEX HD. CAP SCREW
36	SNAP RING	46	THRU CAP	56	HEX HD. NUT
37	INTERMEDIATE PINION	47	BEARING PLATE BOLTS	57	LOCKWASHERS
38	BEARING	48	SPACER	58	FLAT WASHERS
39	BEARING	49	BEARING RET. PLATE BOLTS	59	HEX HD. CAP SCREW
40	GEAR	50	BEARING PLATE DOWELS*	60	LOCKWASHERS
41	HOUSING COVER BOLTS	51	KEYED WASHER	61	SNAP RING
42	HOUSING COVER DOWELS	52	SCOOP	62	LK. NUT & LK. WASHER
43	BEARING PLATE BOLTS	53	MOTOR	63	SPACER
44	BEARING PLATE DOWELS*	54	COUPLING	64	SCRAPER
				65	GUARD

VERTICAL MOTOREDUCER AND VERTICAL IN-LINE REDUCER

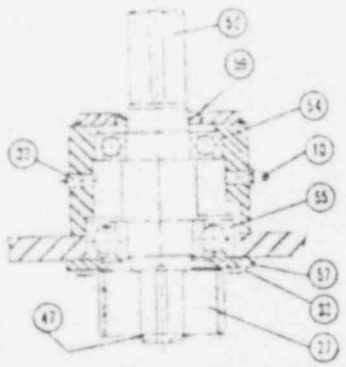
PARTS LIST

ITEM NO.	NAME
	HOUSING
	HOUSING COVER
3	H.S. SHAFT
4	H.S. GEAR
5	BEARING
6	BEARING
7	OIL SEAL
8	UNASSIGNED
9	SPACER
10	GREASE FITTING
11	BREATHER
12	PIPE PLUG
13	SCOOP SPACER
14	INTERMEDIATE GEAR
15	INTERMEDIATE PINION SHAFT
16	INTERMEDIATE GEAR
17	BEARING
18	BEARING PLATE
19	SPACER
20	INTERMEDIATE SHAFT
21	INTERMEDIATE PINION
22	INTERMEDIATE GEAR
23	BEARING
24	BEARING
25	SNAP RING
26	INTERMEDIATE SHAFT
27	H.S. PINION
28	BEARING
29	BEARING
30	SNAP RING
31	INTERMEDIATE PINION
32	RELIEF FITTING
33	BEARING PLATE BOLTS
34	PUMP SHAFT
35	PUMP GEAR
36	BEARING
37	BEARING
38	PUMP ASSEMBLY
39	SPACER
40	DOWELS
41	HEX HEAD BOLT
42	CAP SCREW & LOCKWASHER
43	OIL LEVEL PLUG
44	OIL DRAIN PLUG
45	BEARING PLATE
46	BEARING PLATE DOWELS
47	RETAINER
48	CAP SCREW & WASHER
49	COUPLING GUARD
50	MOTOR DOWEL
51	SNAP RING
52	MOTOR
53	DRY WELL
54	BEARING
55	BEARING
56	H.S. SHAFT
57	RETAINER PLATE
58	LOCKNUT HEAD BOLT
59	OIL SEAL
60	COUPLING
61	MOUNTING BOLT ASSEMBLY
62	SHIM PACK
63	L.S. THRU CAP
64	CAP SCREW & LOCKWASHER
65	BEARING LOCKNUT ASSEMBLY
66	H.S. CAP GASKET
67	MOTOR SCOOP
68	H.S. THRU CAP
69	CAP SCREW & LOCKWASHER
70	MOTOR ADAPTER
71	LOW SPEED BEARING CAP
72	SEAL CARTRIDGE
73	OIL SEAL
74	SNAP RING

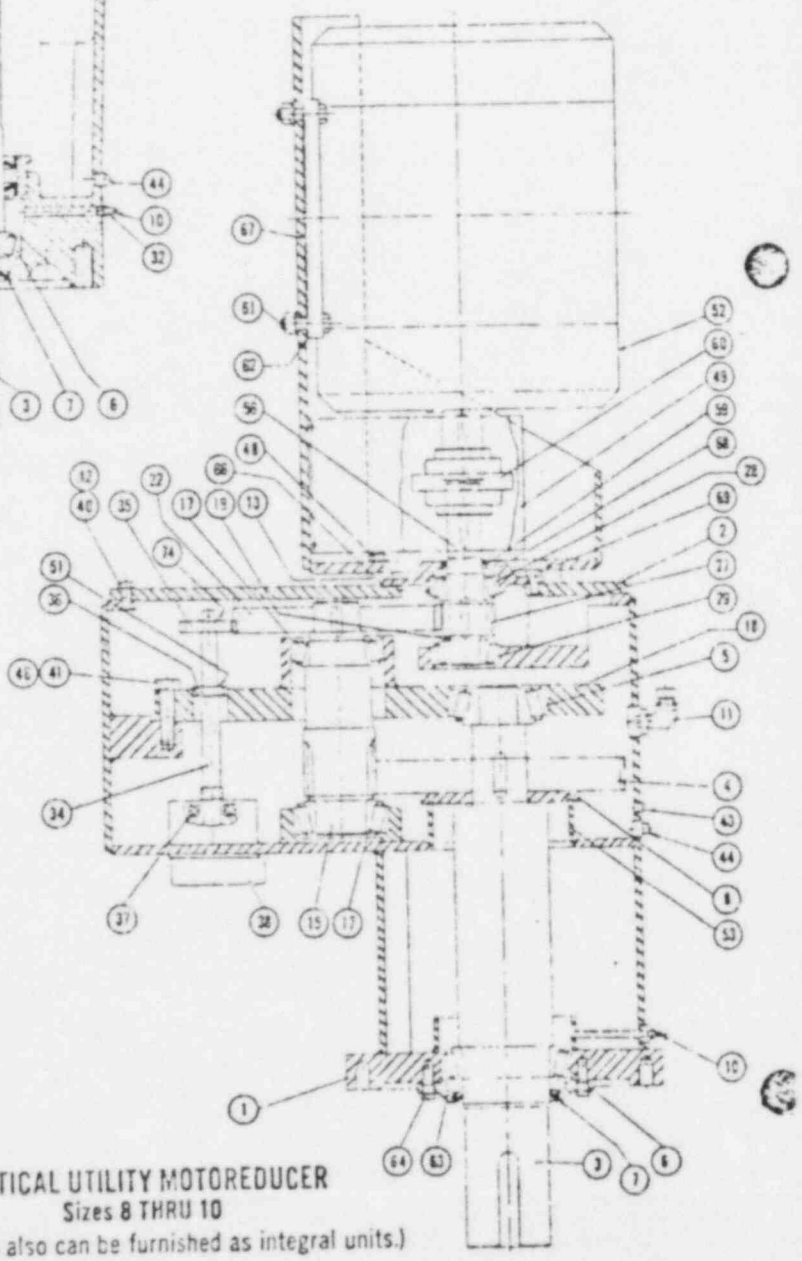
DOUBLE REDUCTION



VERTICAL INTEGRAL MOTOREDUCER
Sizes 3 THRU 7
(These sizes also can be furnished as utility units.)

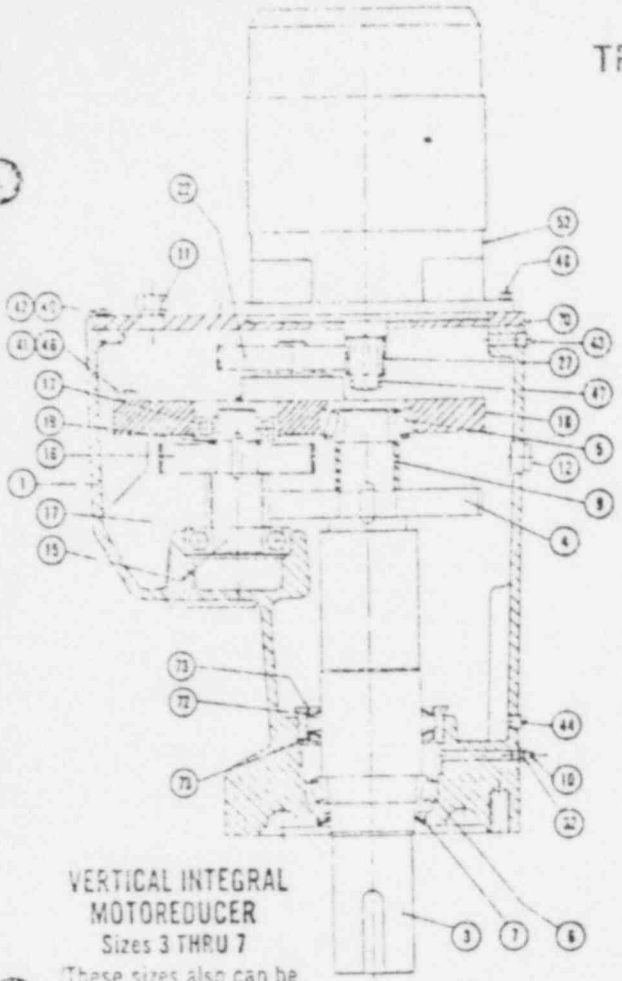


HIGH SPEED ASSEMBLY USED ON 3 THRU 6

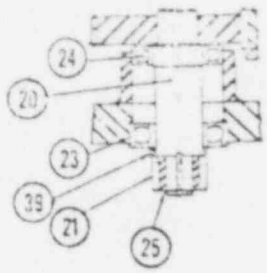


VERTICAL UTILITY MOTOREDUCER
Sizes 8 THRU 10
(These sizes also can be furnished as integral units.)

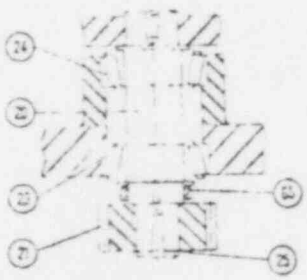
TRIPLE REDUCTION



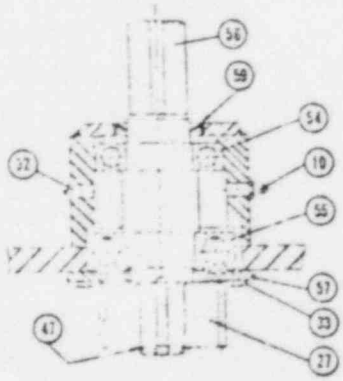
VERTICAL INTEGRAL MOTOREDUCER
Sizes 3 THRU 7
(These sizes also can be furnished as utility units.)



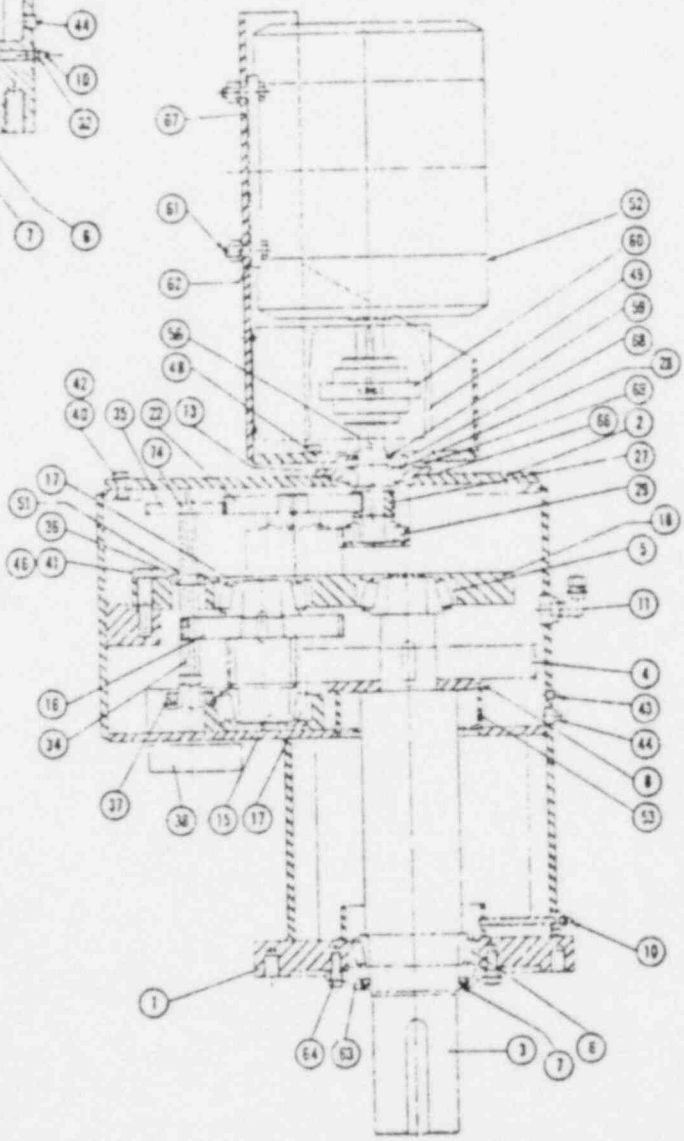
1st INTERMEDIATE SHAFT ASSEMBLY



UTILITY ASSEMBLY



HIGH SPEED ASSEMBLY USED ON 3 THRU 8



VERTICAL UTILITY MOTOREDUCER
Sizes 8 THRU 10
(These sizes also can be furnished as integral units.)

PARTS LIST

ITEM NO.	NAME
1	HOUSING
2	HOUSING COVER
3	L.S. SHAFT
4	L.S. GEAR
5	BEARING
6	BEARING
7	OIL SEAL
8	UMBRELLA
9	SPACER
10	GREASE FITTING
11	BREATHER
12	PIPE PLUG
13	SCOOP SPACER
14	INTERMEDIATE GEAR
15	INTERMEDIATE PINION SHAFT
16	INTERMEDIATE GEAR
17	BEARING
18	BEARING PLATE
19	SPACER
20	INTERMEDIATE SHAFT
21	INTERMEDIATE PINION
22	INTERMEDIATE GEAR
23	BEARING
24	BEARING
25	SNAP RING
26	INTERMEDIATE SHAFT
27	H.S. PINION
28	BEARING
29	BEARING
30	SNAP RING
31	INTERMEDIATE PINION
32	RELIEF FITTING
33	BEARING PLATE BOLTS
34	PUMP SHAFT
35	PUMP GEAR
36	BEARING
37	BEARING
38	PUMP ASSEMBLY
39	SPACER
40	DOWELS
41	HEX HEAD BOLT
42	CAP SCREW & LOCKWASHER
43	OIL LEVEL PLUG
44	OIL DRAIN PLUG
45	BEARING PLATE
46	BEARING PLATE DOWELS
47	RETAINER
48	CAP SCREW & WASHER
49	COUPLING GUARD
50	MOTOR DOWEL
51	SNAP RING
52	MOTOR
53	DRY WELL
54	BEARING
55	BEARING
56	H.S. SHAFT
57	RETAINER PLATE
58	SOCKET HEAD BOLT
59	OIL SEAL
60	COUPLING
61	MOUNTING BOLT ASSEMBLY
62	SHIM PACK
63	L.S. THRU CAP
64	CAP SCREW & LOCKWASHER
65	BEARING LOCKNUT ASSEMBLY
66	H.S. CAP GASKET
67	MOTOR SCOOP
68	H.S. THRU CAP
69	CAP SCREW & LOCKWASHER
70	MOTOR ADAPTER
71	LOW SPEED BEARING CAP
72	SEAL CARTRIDGE
73	OIL SEAL
74	SNAP RING

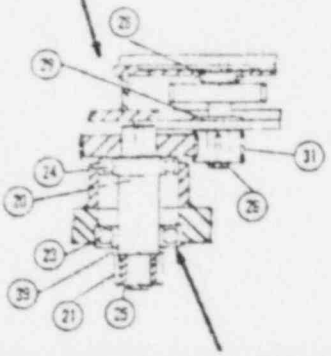
VERTICAL MOTOREDUCER AND VERTICAL IN-LINE REDUCER

PARTS LIST

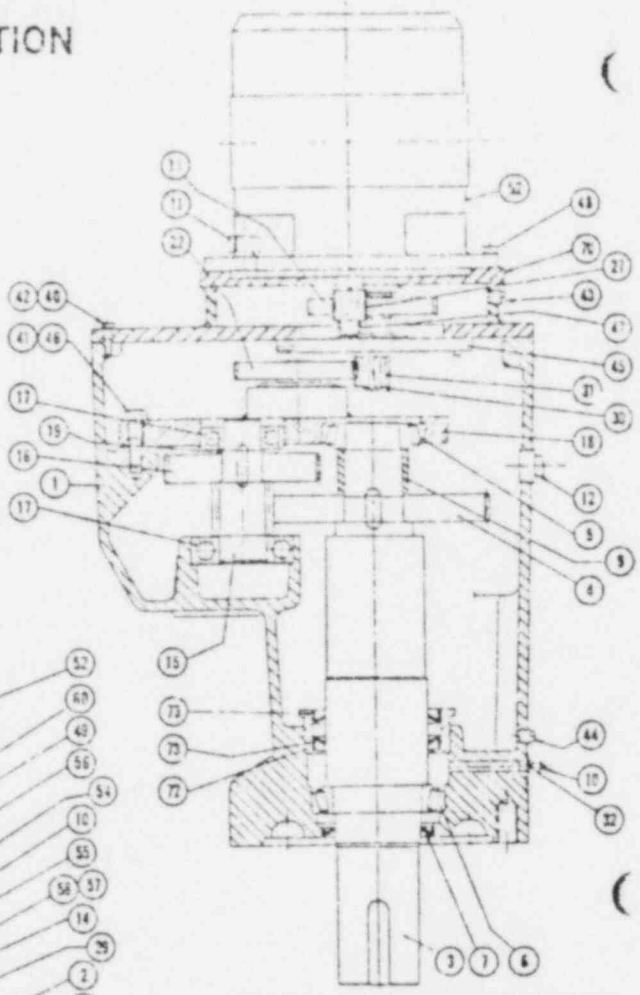
ITEM NO.	NAME
1	HOUSING
	HOUSING COVER
	L.S. SHAFT
4	L.S. GEAR
5	BEARING
6	BEARING
7	OIL SEAL
8	UMBRELLA
9	SPACER
10	GREASE FITTING
11	BREATHER
12	PIPE PLUG
13	SCOOP SPACER
14	INTERMEDIATE GEAR
15	INTERMEDIATE PINION SHAFT
16	INTERMEDIATE GEAR
17	BEARING
18	BEARING PLATE
19	SPACER
20	INTERMEDIATE SHAFT
21	INTERMEDIATE PINION
22	INTERMEDIATE GEAR
23	BEARING
24	BEARING
25	SNAP RING
26	INTERMEDIATE SHAFT
27	H.S. PINION
28	BEARING
29	BEARING
30	SNAP RING
31	INTERMEDIATE PINION
32	RELIEF FITTING
33	BEARING PLATE BOLTS
34	PUMP SHAFT
35	PUMP GEAR
36	BEARING
37	BEARING
38	PUMP ASSEMBLY
39	SPACER
40	DOWELS
41	HEX HEAD BOLT
42	CAP SCREW & LOCKWASHER
43	OIL LEVEL PLUG
44	OIL DRAIN PLUG
45	BEARING PLATE
46	BEARING PLATE DOWELS
47	RETAINER
48	CAP SCREW & WASHER
49	COUPLING GUARD
50	MOTOR DOWEL
51	SNAP RING
52	MOTOR
53	DRY WELL
54	BEARING
55	BEARING
56	H.S. SHAFT
57	RETAINER PLATE
58	SOCKET HEAD BOLT
59	OIL SEAL
60	COUPLING
61	MOUNTING BOLT ASSEMBLY
62	SHIM PACK
63	L.S. THRU CAP
64	CAP SCREW & LOCKWASHER
65	BEARING LOCKNUT ASSEMBLY
66	H.S. CAP GASKET
7	MOTOR SCOOP
68	H.S. THRU CAP
69	CAP SCREW & LOCKWASHER
70	MOTOR ADAPTER
71	LOW SPEED BEARING CAP
72	SEAL CARTRIDGE
73	OIL SEAL
74	SNAP RING

QUADRUPLE REDUCTION

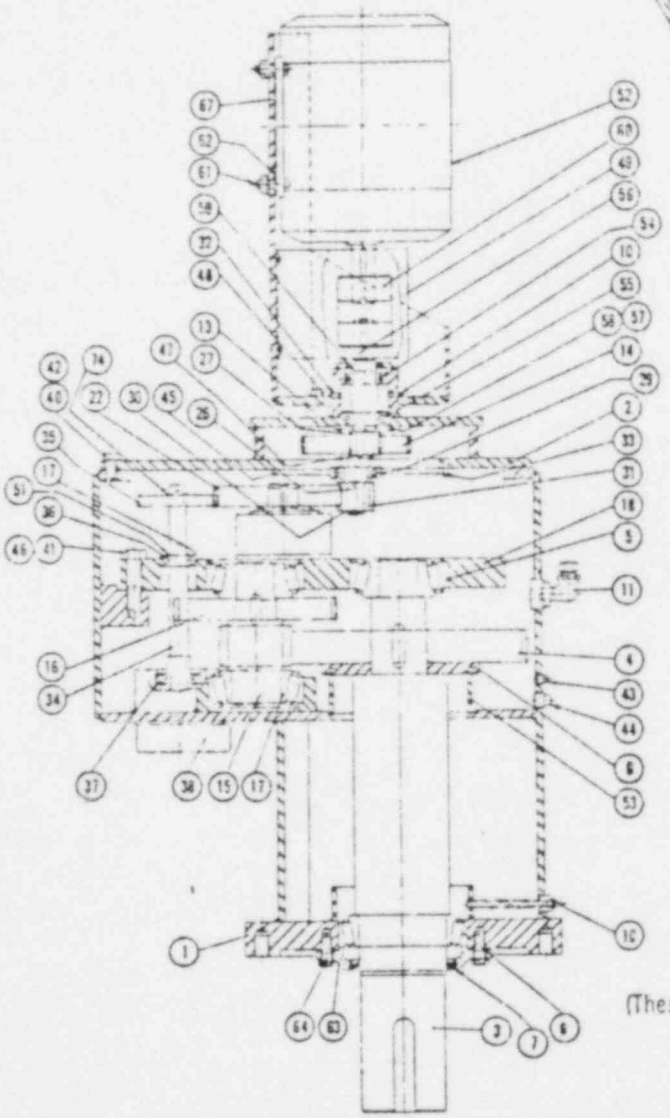
1st INTERMEDIATE SHAFT ASSEMBLY



2nd INTERMEDIATE SHAFT ASSEMBLY



VERTICAL INTEGRAL MOTOREDUCER
Sizes 5 THRU 7
(These sizes also can be furnished as utility units.)



VERTICAL UTILITY MOTOREDUCER
Sizes 8 THRU 10
(These sizes also can be furnished as integral units.)

PHILADELPHIA GEAR DRIVES

Application Engineered Power Transmission Products

Philadelphia Gear Corporation ■ King of Prussia, Pa. 19406 ■ (215) 265-3000

Westinghouse

Medium Ac Motors
Type T

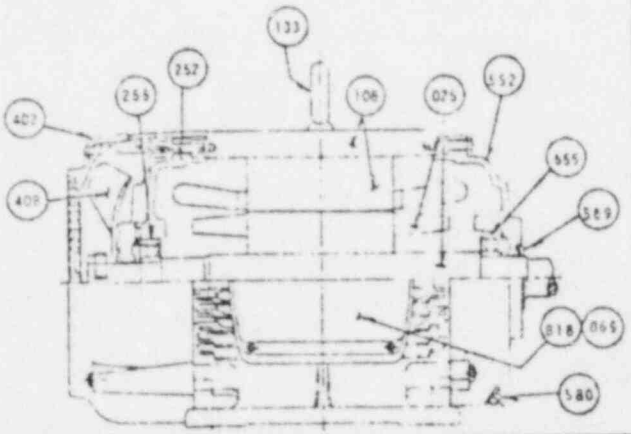
Polyphase, Fan Cooled and
M/I & Chemical
Frames 324T to 365TS

ORDERING INFORMATION:

WHEN ORDERING RENEWAL PARTS, GIVE THE NAME OF THE PART AND ITS STYLE NO.

ADD'L. INFORMATION:

THIS PARTS LIST WILL APPLY TO THE FOLLOWING MOTOR BLOCKS: 5,6,7,9,10,14,15,17,19 & 20 ALL PARTS ARE PRICED IN PEG 120.



PART NO.	PART DESCRIPTION ⑤	PART IDENTITY BY FRAME SIZE			
		324-6T	324-6TS	364-5T	364-5TS
402	L-000	7328015G02	7328015G02	7998015G08	7998015G08
409	FAN & FAN CLAMP (0 TO 1999 RPM)	7998013G10	7998013G10	7998013G12	7998013G12
[illegible]	[illegible]	[illegible]	7998013G11	7998013G13	7998013G13
255 ①	FRONT BEARING	2236030G03	2236030G03	2236030G01	2236030G01
252	FRONT BRACKET	3840756H03	3840756H03	3840782H02	3840782H02
108	FR. & HD. STATOR CORE	⑦	⑦	⑦	⑦
075	SHAFT & ROTOR CORE	⑦	⑦	⑦	⑦
133	EYEBOLT	7998012G68	7998012G84	7998012G65	7998012G65
818	CONDUIT BOX (CAST IRON-MILL & CHEM.)	[illegible]	[illegible]	7998011G04	7998011G04
869	CONDUIT BOX (CAST IRON-MILL & CHEM.) ⑦	[illegible]	7998011G17	7998011G13	7998011G13
869	GROUND LUG (MILL & CHEMICAL)	7998012G24	7998012G24	7998012G24	7998012G24
552	REAR BRACKET	3840757H04	3840756H06	3840782H01	3840782H01
555 ①	REAR BEARING	2236030G04	2236030G03	2236030G01	2236030G01
409 ①	REAR EXT. SLINGER	7998012G16	7998012G56	7998012G52	7998012G52
580	[illegible]	[illegible]	[illegible]	7998012G01	7998012G01
	FOR MOTORS SERIAL NO. 7205 &	CAST IRON MILL & CHEMICAL PARTS			
252	FRONT BRACKET	3840756H01	3840756H01	3840782H01	3840782H01
255	EXT. BEARING CAP	7998680H01	7998680H01	7998680H01	7998680H01
555	REAR BEARING CAP	7998680H02	7998680H01	7998680H04	7998680H01
552	REAR BRACKET	3840757H01	3840756H02	3840782H01	3840782H02

① PARTS RECOMMENDED FOR STOCK.

② CONTACT WESTINGHOUSE SALES REPRESENTATIVE.

③ GRAY TOUCH UP ENAMEL IN (1) PINT CANS IS AVAILABLE. ORDER AS S#7998012G90 (REFER TO PL 2910 PWEA).

④ RECOMMENDED BEARING GREASE IS AVAILABLE. ORDER 10 LB. - S#7734773G10 OR 35 LB. - S#7734773G35 (REFER TO PL 2910 PWEA)

⑤ SEE PRICE LIST 2910 PWEA FOR QUANTITIES INCLUDED IN THE REDI-PAK STYLES.

⑥ GREEN TOUCH UP ENAMEL IN (1) PINT CANS IS AVAILABLE. ORDER AS S#7998012G91 (REFER TO PL 2910 PWEA).

CUSTOMER HUDSON PRODUCTS CUSTOMER ORDER NO. A53977
GEN. ORDER NO. H6174714 ITEM S.O. OR STYLE NO. 76C63714
WESTINGHOUSE ELECTRIC CORP. FRAME SIZE 326T DATE 9-24-76

DRAWING TRANSMITTAL
CONSTRUCTION APPROVAL 10/4/76
DATE

Westinghouse Electric Corporation
(Nuclear)

PROJECT NO.	WESTINGHOUSE P.O. NO.	CUSTOMER REQUISITION NO.	CUSTOMER ORDER NO.
	MU-74714 MG		453977

CUSTOMER
HUDSON PRODUCTS CORP
P.O. BOX 36100
HOUSTON TEXAS 77036

ULTIMATE USER & LOCATION OR STATION
LOUISIANA POWER & LIGHT CO
WATERFORD STATION UNIT 3 -1165MW
ST CHARLES PARISH LOUSIANA

PRINTS ARE:

☐ FOR APPROVAL

Drawings are in compliance with your specified requirements. Drawings "Approved" or "Approved with Modifications" authorize Westinghouse to proceed with manufacture. Modifications not in the contract or modifications made during or after drawing approval may result in a price change and/or shipment delay. To maintain shipping schedule, approved drawings must be received by Westinghouse no later than _____

☒ FOR CONSTRUCTION OR INSTALLATION

The equipment shown on these drawing(s) has been released for manufacture, any modification may result in a price change and shipment delay.

☐ FOR REFERENCE

☐ _____

QTY-30 ITEM :1 SO# 76C63714

MARK:
COOLING WATER SYSTEM DRY COOLING TOWERS

DESCRIPTION:

HP: 40/10	FLA: 48/16	AMBIENT: 40°C
RPM: 1750/875	ENCL: TEFC	MOUNTING: HORIZONTAL
FRAME: 326T	TYPE: SQUIRREL CAGE	SHAFT EXT: FRONT-NONE REAR-STRAIGHT
MODEL:TUFC	NEMA DESIGN: U	DUTY: CONTINUOUS
VOLTAGE: 460	INSUL: H, PMR	SPACE HEATERS: 230V
PHASE: 3	SERV. FACTOR: 1.00	THERMAL PROT: NONE
HERTZ: 60	ASSY: F1	BEARINGS: BALL

ADDITIONAL FEATURES: CONDULET; OVERSIZE CONDUIT BOX; FRAME GROUND PAD; MILL & CHEMICAL FEATUR
BREATHER & DRAIN IN CONDUIT BOX

OUTLINE DWG: 3840800 14 EXCEPT CONDULET PER 5626D11G07 - PIPE TAPE 3-INCHES
+O/L 5626D11G07 (condulet) Sub 6
+ 7988515 (ground Pad) Sub 1
+RPD2900B1, pg.9 (attached)
+ DATA SHEET (attached)
+IL 2930-11TD

30 COPIES (each) HUDSON PRODUCTS CORP/P.O. BOX 36100
HOUSTON TEXAS 77036/ATTN: CARRIE ROGERS(HD-003)

1 COPY HOUSTON OFFICE - JEAN ROBERTS

T/S C. L. CAPOTHERS/kcza MAGD BUFFALO RONS

SEND APPROVAL OR INQUIRIES TO WESTINGHOUSE C/O
DISTRICT ORDER CORRESPONDENT STREET ADDRESS CITY ZONE STATE

9/29/76

(N) G.O.# HU-74714 ITEM:1
S.O.#76063714 Specification Ebasco 214-70

Project Identification
No. LOU 1564.264

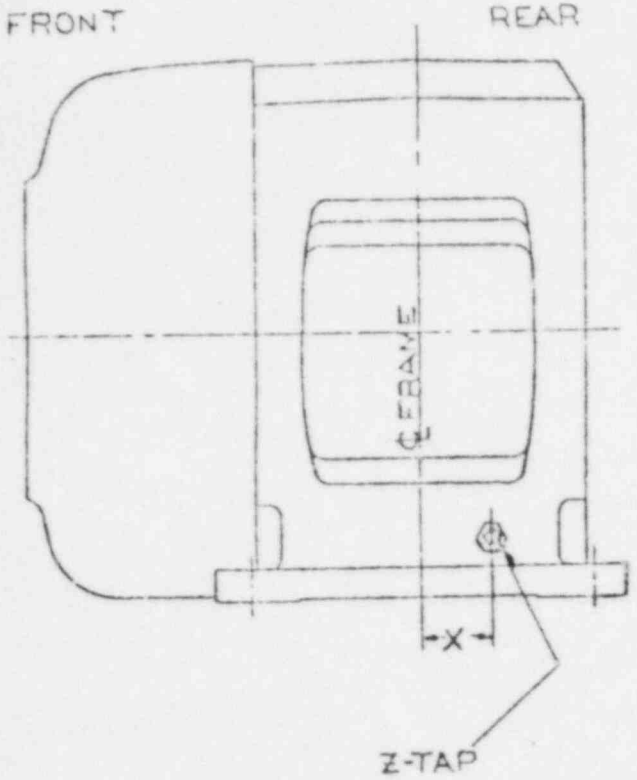
Motors for Station Auxiliary Service
Furnished With Driven Equipment
Rated up to 460 Volt and 250 HP
(Excluding Valve Motors)

28. (Cont'd)

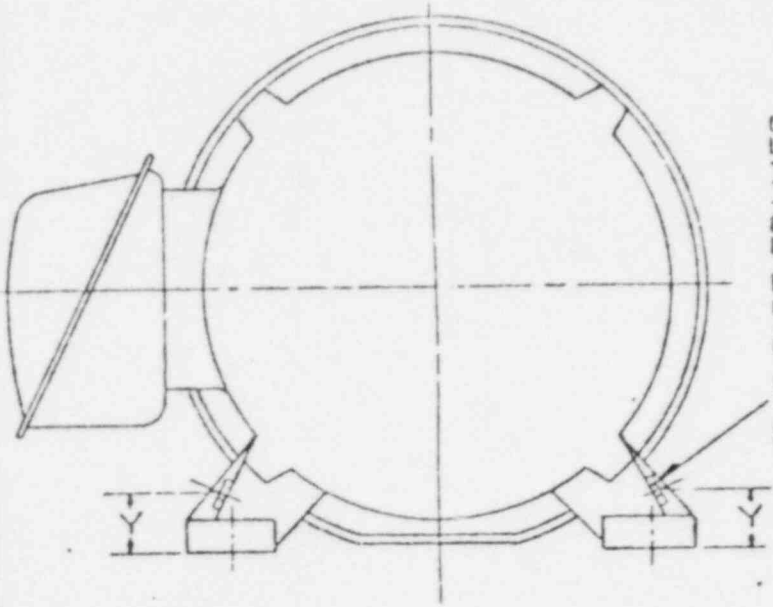
LIST OF MOTORS (Cont'd)

Line						
1	Item No. *	1				
2	Quantity *	30				
	Service (Driven Equipment) *	COOLING WATER SYSTEM DRY COOLING TOWERS				
4	Horsepower/SF *	40 / 1.0	/	/	/	P
5	Voltage Rating/Phase *	460/ 3	/	/	/	
6	Synch Speed Frequency/(Hz) *	1800 rpm/ 60	/	/	/	
7	Min Recovery Voltage During Start	90% of Nameplate Voltage				R1
8	Run Voltage Dip/Sec	25%/ 2 Secs	/	/	/	
9	Location *	OUTDOOR				
10	Insulation *	H				R
11	Encl & Vent *	FC /	/	/	/	
12	Temp Ambient/Rise °C *	40 /	/	/	/	
13	Shaft *	T				
14	Connection *	[illegible]				
15	Bearings *	BALL				
16	External Cable Lug - Size *	[illegible]				
17	Conduit Size *	3"				
18	Space Heater *	230V				
19	Conduit Box *	3"				
20	Bearing/Winding Temp Det *	— / —	/	/	/	R1
21	Seismic * Coefficient — D-h/v	.00g/ .67g	/	/	/	R1
	O-h/v	.50g/ .34g	/	/	/	
22	Normal/Max Brake - HP *	/	/	/	/	
23	Normal Down/up Thrust *	/	/	/	/	
24	Momentary Down/up Thrust *	/	/	/	/	
25	Manufacturer *	(W)				
26	Class 1 E Equip(Yes/No) *	yes				R1
27	Total Integrated Absorbed Radiation Dose - Rads *	1×10^7				R1
28	Tornado Proof (Yes/No) *	yes				R1

* To be completed by Seller.



FRAME	X	Y	Z
143&5	—	.94	.250-20
182	1.00	1.12	.375-16
184	1.50	1.12	
213	1.50	1.25	
215	2.00	1.25	
254	2.50	1.50	
256	3.00	1.50	
284	2.75	1.75	
286	3.50	1.75	
324	3.00	2.25	
326	3.75	2.25	
364	3.00	2.00	.500-13
365	3.50	2.00	
404	3.50	2.25	
405	4.00	2.25	
444	4.50	2.50	
445	5.00	2.50	
447	5.75	2.50	
449	6.00	2.25	



SUB 1

1	E82179	A	CHANGE

WESTINGHOUSE ELECTRIC CORPORATION

TITLE A.C. MOTOR FR. 143 TO 449 FANCOOLED
SUPP. OUTLINE GROUNDING PAD

DIMENSIONS IN INCHES – SCALE N.T.S.

DFTM. ALBERT 13-72 APPD. APPD. APPD.

DIV. & PLANT LOCATION MOTOR

798B515

BUFFALO DIVISION, BUFFALO, N.Y., U.S.A.

DRAWING TRANSMITTAL

DATE 10/4/76

Westinghouse Electric Corporation

(Nuclear)

PROJECT NO.	WESTINGHOUSE O.E. NO.	CUSTOMER'S ORDER NO.	CERTIFIED DRG. NO.
	76-73714 MG		450977

OWNER
HUDSON PRODUCTS CORP
P.O. BOX 36100
HOUSTON TEXAS 77036

ULTIMATE USER & LOCATION OF STATION
LOUISIANA POWER & LIGHT CO
WATERFORD STATION UNIT 3 -7166MW
ST CHARLES PARISH LOUISIANA

REMARKS:

[ ] FOR APPROVAL

Drawings are in compliance with your specified requirements. Drawings "Approved" or "Approved with Modifications" authorize Westinghouse to proceed with manufacture. Modifications set in the contract or modifications made during or after drawing approval may result in a price change and/or shipment delay. To maintain shipping ratedate, approved drawings must be received by Westinghouse as noted thereon.

[X] FOR CONSTRUCTION OR INSTALLATION

The equipment shown on these drawings has been released for manufacture, any modification may result in a price change and shipment delay.

[ ] FOR RECORDS ONLY

[ ]

QTY-30 ITEM #1 SO # 76063714

MARK:
COOLING WATER SYSTEM DRY COOLING TOWERS

DESCRIPTION:

HP: 9 40/30	FLA: 48/36	AMBIENT: 40°C
RPM: 1750/875	ENCL: TEFC	MOUNTING: HORIZONTAL
FRAME: 326T	TYPE: SQUIRREL CAGE	SHAFT EXT: FRONT-NONE REAR-STRAIGHT
MODEL: GUFC	NEMA DESIGN: B	DUTY: CONTINUOUS
VOLTAGE: 460	INSUL: H, RMR	SPACE HEATERS: 230V
PHASE: 3	SERV. FACTOR: 1.00	THERMAL PROT: NONE
HERTZ: 60	AMBY: F1	BEARINGS: BALL

ADDITIONAL FEATURES: CONDULET; OVERSIZE CONDUIT BOX; FRAME GROUND PAD; MILL & CHEMICAL FEATURE; SPEATHER & DRAIN IN CONDUIT BOX

OUTLINE DWG: 3848800 14 EXCEPT CONDULET PER 5626D11G07 - PIPE TAPE 3" INCHES
+O/L 5626D11G07 (condulet) Sub 6
+ 7983516 (ground Pad) Sub 1
+RPC290067, pg.5 (attached)
+ DATA SHEET (attached)
+EL 2930-11TD

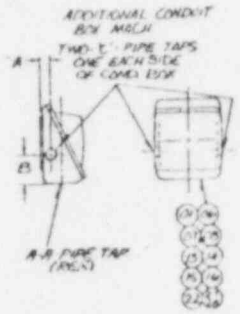
30 COPIES (each) HUDSON PRODUCTS CORP/P.O. BOX 36100
HOUSTON TEXAS 77036/ATTN: CARRIE ROGERS(ND-002)

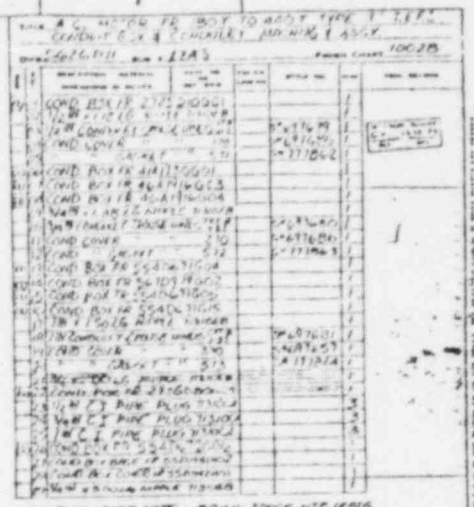
1 COPY HOUSTON OFFICE - JEAN ROBERTS

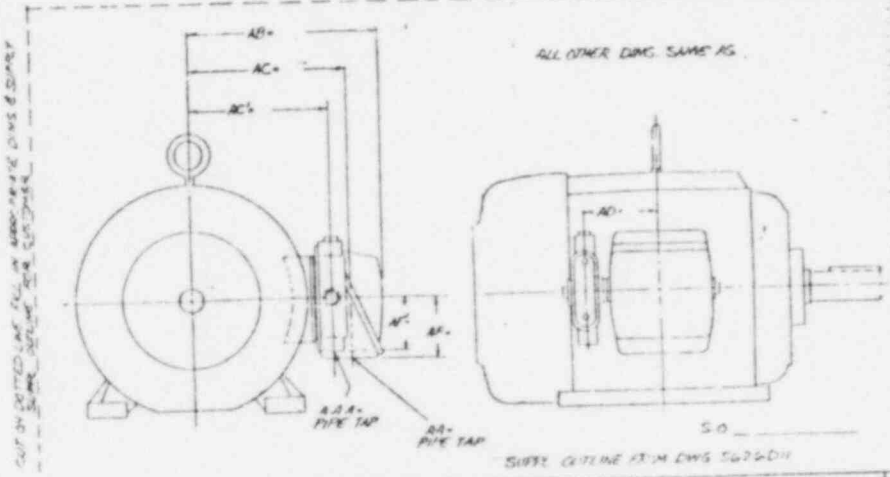
FOR APPROVAL OR INQUIRIES TO WESTINGHOUSE, ADDRESS CORRESPONDENCE TO: C. A. CARLTHER(Mgr.) STREET ADDRESS MAGD BUFFALO RONS CITY N.Y. ZONE STATE

9/29/76

					FAN COOLED					AD	A	B	C	
					AB	AC	AK	AJ	AF					
			½	180	7.88	6.74	5.84	2.34	3.50	3.12	7.8	1.68	½	STANDARD AND OVERSIZE
			½	210	7.12	7.43	6.82	1.88	2.80	4.38	8.8	2.88	½	
			½	210	11.30	9.55	9.45	3.38	2.80	4.84	7.12	3.38	½	
			½	210	10.24	7.12	7.42							
				320	12.14	9.60	8.98							
			2	360	13.30	11.86	9.54	3.38	3.11	5.18	7.12	3.38	¾	
				400	15.42	13.70	10.44							
			2½	444.5	20.32	16.57	15.00	6.62	4.61	6.06	7.00	5.12	¾	
			3	447	20.76	16.50	15.00	8.50	4.79	7.12	7.00	6.82	¾	
			2½	320	16.62	12.80	12	6.62	4.61	6.06	7.00	5.12	¾	OVERSIZE ONLY
			3	360	17.30	13.38	12.32	6.62	4.61	6.06	7.00	5.12	¾	
			3½	400	18.82	15.00	13.44	6.62	4.61	6.06	7.00	5.12	¾	
			4	444.5	20.76	16.50	15.00	8.50	4.79	7.12	7.00	6.82	¾	
			4½	447	23.84	18.66	15.82	10.38	9.67	8.75	7.00	6.82	¾	
			5	447	24.30	18.38	15.00	9.38	5.67	7.83	7.00	6.82	¾	
			?	180	18.82	15.76	12.26	6.62	4.61	8.00	7.00	5.12	¾	STANDARD



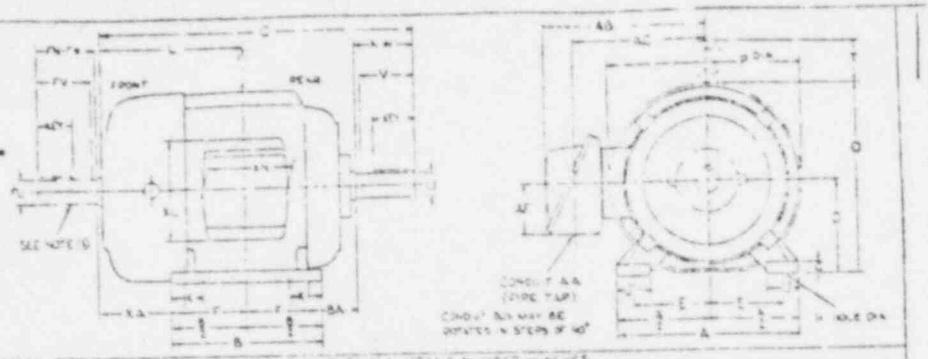




WESTINGHOUSE ELECTRIC CORPORATION

A.C. MOTOR TO MOT 10440 T.E.F.C.
TYPE 'T' CONDUIT BOX & CONDUIT MOUNTING ASSY

5626D11



DIMENSIONS ARE IN INCHES FOR EACH FRAME NUMBER

FRAME SIZE	D (KEY SEAT)	F	V	KEY SEAT	D (KEY SEAT)	F	V	KEY SEAT	A	B	C	D ①	E	F	G	H	J	K	L	O	P	T	BA	AA	APPROX WT LBS
182T	1.250	2.75	2.50	2.5 × .25 × 1.75	1.250	2.75	2.50	.187 × .187 × 1.375	6.88	5.38	4.42	4.50	3.75	2.75	2.50	4.56	.84	—	6.67	9.50	9.60	—	2.75	4.93	85
184T	1.250	2.75	2.50	2.5 × .25 × 1.75	1.250	2.75	2.50	.187 × .187 × 1.375	8.81	6.94	5.42	4.50	3.75	2.75	2.50	4.56	.84	—	7.11	9.50	9.60	—	2.75	4.93	100
213T	1.750	3.38	3.12	3.12 × .312 × 2.375	1.750	3.74	3.62	2.5 × .25 × 1.75	10.62	7.00	5.75	5.25	4.25	2.75	3.62	5.06	.96	—	8.03	10.86	11.20	.88	3.50	5.83	140
215T	1.750	3.38	3.12	3.12 × .312 × 2.375	1.750	3.74	3.62	2.5 × .25 × 1.75	10.62	8.50	9.00	5.25	4.25	3.50	3.62	5.06	.96	—	8.82	10.86	11.20	.88	3.50	5.83	175
254T	2.625	4.00	3.75	3.75 × .375 × 2.875	2.500	3.38	3.12	3.12 × .312 × 2.375	12.56	10.24	12.50	6.25	5.00	4.12	4.12	7.44	.53	2.62	—	10.63	12.88	13.26	2.32	4.25	7.25	260
256T	2.625	4.00	3.75	3.75 × .375 × 2.875	2.500	3.38	3.12	3.12 × .312 × 2.375	12.56	12.00	14.19	6.25	5.00	5.00	4.12	7.44	.53	2.62	—	11.50	12.88	13.26	2.32	4.25	7.25	340
284T	2.875	4.62	4.38	5.00 × .500 × 3.25	2.625	4.00	3.75	3.75 × .375 × 2.875	13.88	12.00	15.75	7.00	5.50	4.75	4.88	7.81	.53	2.62	2.74	11.63	14.38	14.72	2.32	4.75	7.63	360
284TS	2.625	3.25	3.00	3.75 × .375 × 1.875	2.625	3.25	3.00	3.75 × .375 × 1.875	13.88	12.00	14.38	7.00	5.50	4.75	4.88	7.81	.53	2.62	2.74	11.63	14.38	14.72	2.32	4.75	7.63	360
286T	2.875	4.62	4.38	5.00 × .500 × 3.25	2.625	4.00	3.75	3.75 × .375 × 2.875	13.88	13.50	17.25	7.00	5.50	5.50	4.88	7.81	.53	2.62	2.74	12.38	14.38	14.72	2.32	4.75	7.63	450
286TS	2.625	3.25	3.00	3.75 × .375 × 1.875	2.625	3.25	3.00	3.75 × .375 × 1.875	13.88	13.50	15.88	7.00	5.50	5.50	4.88	7.81	.53	2.62	2.74	12.38	14.38	14.72	2.32	4.75	7.63	450
324T	3.125	5.25	5.00	5.00 × .500 × 3.25	3.125	4.62	4.38	5.00 × .500 × 3.25	15.12	13.50	18.62	8.00	6.25	5.25	5.00	8.56	2.56	3.26	13.05	16.50	17.00	2.75	5.25	9.90	550
324TS	3.125	3.75	3.50	5.00 × .500 × 2.00	3.125	3.75	3.50	5.00 × .500 × 2.00	15.12	13.50	21.38	9.00	6.25	5.25	5.00	8.56	2.56	3.26	13.05	16.50	17.00	2.75	5.25	9.80	550
326T	3.125	5.25	5.00	5.00 × .500 × 3.875	3.125	4.62	4.38	5.00 × .500 × 3.25	15.12	15.00	20.38	8.00	6.25	6.00	5.00	8.56	2.56	3.26	13.80	16.50	17.00	2.75	5.25	9.80	610
326TS	3.125	3.75	3.50	5.00 × .500 × 2.00	3.125	3.75	3.50	5.00 × .500 × 2.00	15.12	15.00	23.88	8.00	6.25	6.00	5.00	8.56	2.56	3.26	13.80	16.50	17.00	2.75	5.25	9.80	610
364T	3.625	6.12	6.62	6.25 × .625 × 4.25	3.625	5.12	5.38	6.25 × .625 × 4.25	17.00	15.00	21.62	9.00	7.00	6.62	5.00	9.44	3.12	3.50	15.24	18.56	19.12	3.12	6.25	10.62	815
364TS	3.625	3.75	3.50	5.00 × .500 × 2.00	3.625	3.75	3.50	5.00 × .500 × 2.00	17.00	15.00	23.38	9.00	7.00	6.62	5.00	9.44	3.12	3.50	15.24	18.56	19.12	3.12	6.25	10.62	835
365T	3.625	5.88	6.62	6.25 × .625 × 4.25	3.625	4.62	4.38	5.00 × .500 × 3.25	17.00	16.50	23.62	9.00	7.00	6.62	5.00	9.44	3.12	3.50	15.24	18.56	19.12	3.12	6.25	10.62	920
365TS	3.625	3.75	3.50	5.00 × .500 × 2.00	3.625	3.75	3.50	5.00 × .500 × 2.00	17.00	16.50	25.38	9.00	7.00	6.62	5.00	9.44	3.12	3.50	15.24	18.56	19.12	3.12	6.25	10.62	920
404T	4.125	7.25	7.50	7.50 × .750 × 5.625	4.125	5.25	5.00	6.25 × .625 × 3.875	19.12	16.50	24.62	10.00	8.00	6.62	5.00	9.44	3.12	3.88	17.24	20.12	21.50	3.12	6.25	10.62	1145
404TS	4.125	4.25	4.00	5.00 × .500 × 2.75	4.125	4.25	4.00	5.00 × .500 × 2.75	19.12	16.50	25.62	10.00	8.00	6.62	5.00	9.44	3.12	3.88	17.24	20.12	21.50	3.12	6.25	10.62	1145
405T	4.875	7.25	7.00	7.50 × .750 × 5.625	4.125	5.25	5.00	6.25 × .625 × 3.875	19.12	18.00	25.62	10.00	8.00	6.62	5.00	9.44	3.12	3.88	17.24	20.12	21.50	3.12	6.25	10.62	1260
405TS	4.875	4.25	4.00	5.00 × .500 × 2.75	4.125	4.25	4.00	6.25 × .625 × 4.75	19.12	18.00	25.62	10.00	8.00	6.62	5.00	9.44	3.12	3.88	17.24	20.12	21.50	3.12	6.25	10.62	1260
444T	3.375	8.50	8.25	8.50 × .875 × 6.875	3.375	5.88	5.62	6.25 × .625 × 4.25	21.50	16.50	26.12	11.00	9.00	7.75	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	1650
444TS	3.375	4.75	4.50	6.25 × .625 × 3.00	3.375	4.75	4.50	6.25 × .625 × 3.00	21.50	16.50	28.38	11.00	9.00	7.75	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	1650
445T	3.375	9.50	8.25	8.75 × .875 × 6.875	3.375	5.62	5.62	6.25 × .625 × 4.25	21.50	18.50	26.12	11.00	9.00	8.75	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	1750
445TS	3.375	4.75	4.50	6.25 × .625 × 3.00	3.375	4.75	4.50	6.25 × .625 × 3.00	21.50	18.50	28.38	11.00	9.00	8.75	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	1750
447T	3.375	8.50	8.25	8.50 × .875 × 6.875	3.375	5.88	5.62	6.25 × .625 × 4.25	21.50	22.00	26.12	11.00	9.00	10.62	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	2250
447TS	3.375	4.75	4.50	6.25 × .625 × 3.00	3.375	4.75	4.50	6.25 × .625 × 3.00	21.50	22.00	28.38	11.00	9.00	10.62	2.26	8.12	3.50	4.00	18.88	23.06	24.16	3.12	7.50	12.88	2250

FRAME SERIES	STANDARD CONDUIT BOX AA	AB	AC	AF	XL	XN	OVERSIZE CONDUIT BOX AA	AB	AC	AF	XL	XN
182-4	2¼	7.58	6.24	2.98	4.74	4.13	SAME AS STANDARD BOX					
213-5	2½	9.12	7.44	2.88	5.62	4.76	SAME AS STANDARD BOX					
254-6	1⅞	11.30	8.98	3.38	6.76	5.09	SAME AS STANDARD BOX					
284-6	1⅞	12.24	9.92	3.38	6.76	5.09	SAME AS STANDARD BOX					
324-6	2 ⑥	13.24	10.92	3.38	6.76	5.69	2½	16.62	12.80	6.62	10.26	7.76
364-5		14.32	12.00				3 ⑦	17.30	13.55			
404-5		15.44	13.12				3½	18.62	15.00			
444-5	2½	20.32	16.44	4.62	10.26	7.76	4 ⑦	20.30	16.44	8.50	13.62	10.00
447	4 ⑥	20.10	16.44	8.50	13.62	10.00	5	24.30	18.55	9.38	15.44	11.50

NOTES:

① THIS DIMENSION WILL NOT BE EXCEEDED WHEN EXACT DIMENSION IS REQUIRED, SHIMS UP TO .03 OF AN INCH MAY BE NECESSARY FOR FRAMES 587 TO 5287 AND .06 OF AN INCH FOR FRAMES 5847 TO 6477.

② MANUFACTURERS ALLOWANCE +.000, -.002 FOR SHAFT DIA. 1.900 AND BELOW AND +.000, -.003 FOR SHAFT DIA. ABOVE 1.900.

③ DOUBLE EXTENDED SHAFT AVAILABLE ONLY WHEN SPECIALLY ORDERED THIS FRONT EXTENSION IS NOT SUITABLE FOR TRANSMITTING RATED TORQUE THROUGH BELT DRIVE.

④ STANDARD CONDUIT BOX SUPPLIED ON 220 FRAME FOR VOLTAGE RATING 2300 OR HIGHER. FOR VOLTAGES 2300 AND BELOW OVERSIZE CONDUIT BOX IS SUPPLIED.

⑤ FOR ALL 3 LEADED, THREE INDICATED DIMENSIONS ARE FOR STANDARD CONDUIT BOX. FOR ALL 6 LEADED, THREE INDICATED DIMENSIONS ARE FOR OVERSIZE CONDUIT BOX IS SUPPLIED.

⑥ INSULATION CLASSIFICATION A AND B FOR 2.3 KV AND 4.16 KV, CLASS B FOR 6.9 KV AND 13.8 KV.

⑦ INSULATION CLASSIFICATION A AND B FOR 2.3 KV AND 4.16 KV, CLASS B FOR 6.9 KV AND 13.8 KV.

WESTINGHOUSE ELECTRIC CORPORATION

FOR A.C. MOTOR FRAMES 182 TO 447 INCLUSIVE

FAN COOLED ENCLOSURE

304D300

Installation and Maintenance Instructions for your Westinghouse Medium Motor

I.L. 2930-11TD

RECEIVING

1. Check Nameplate Data.

2. Turn shaft by hand to check that it turns freely.

3. Request "Receiving and Storage Instructions" for long-term storage indoors or any storage outdoors.

4. Lifting eyebolts are designed for raising the motor alone and should be removed after installing motor.

Warning The following safety precautions *must* be observed:

1. Electric rotating machinery and high voltage can cause serious or fatal injury if improperly installed, operated or maintained. Responsible personnel should be familiarized with NEMA MG2, safety standards for construction and guide for selection, installation and use of electric motors and generators, national electric code and all local safety requirements.

2. All power sources to the motor and to the accessory devices should be de-energized and disconnected and all rotating parts should be at standstill.

3. Lifting means, when supplied, are intended for lifting the motor *only*. When two lifting devices are supplied with the motor a dual chain must be used.

4. Suitable protection must be used when working near machinery with high noise levels.

5. Safeguard or protective devices must not be by-passed or rendered inoperative.

6. The frame of this machine must be grounded in accordance with the National Electrical Code and applicable local codes.

7. Avoid contact with start or run capacitors in single-phase motors until a safe discharge procedure has been followed.

8. A suitable enclosure should be provided to prevent access to the rotating parts other than authorized personnel. Extra caution should be observed around motors that are automatically controlled or have automatic re-setting relays as they may restart unexpectedly.

9. Enclose all belts to prevent injury from broken belts.

10. Shaft key must be fully captive before motor is started.

11. Provide proper safeguards for personnel against possible failure of motor-mounted brake, particularly on applications involving overhauling loads.

LOCATION

1. Dripproof motors are intended for use where atmosphere is relatively clean, dry, and non-corrosive. Keep windings clean with a soft brush, cloth or suction.

2. Totally enclosed motors may be installed where dirt, moisture and corrosion are present, or in outdoor locations. The drain plug in the end bracket must be removed periodically to drain accumulated condensation.

3. Explosionproof motors are built for use in hazardous locations as indicated by Underwriters' label on the motor.

Note: In all cases, no surrounding structure should obstruct normal flow of ventilating air through or over the motor.

INSTALLATION

Fasten securely to a flat base with maximum size bolts. All ball or roller bearing normal thrust motors may be mounted in any position. Do not drive sheaves, couplings, sprockets or pinions on motor shaft.

Direct Drive

Align shafts accurately. If reverse rotation is detrimental to the driven device check rotation BEFORE connecting the motor to the load. See "start up".

V-Belt Drive

1. Mount motor sheave close to bearing housing.

2. Allow sufficient clearance for rotor end play.

3. Sheave diameter should not be less than NEMA recommended value. See NEMA MG1-14.42.

4. Align sheaves carefully, tighten belts only enough to prevent slippage.

Flange Motor

Fits are accurately machined to mate with driven equipment. Mating surfaces must be free of dirt or burrs and solidly engaged. The assembly should turn freely without stressing shaft and bearings from misalignment and thrust.

ELECTRICAL CONNECTIONS

1. Connect motor per nameplate to correct power supply.

2. Install all wiring, fusing and grounding in accordance with National Electrical Code and local requirements.

3. Identify motor auxiliary devices such as space heaters or temperature sensors. Connect in proper circuits and insulate from motor power cables.

Wound Rotor Motors

a) Connect cables from secondary control to brushholder assembly. Bring cables through squeeze connector on front bracket, where provided.

b) Slip rings must be maintained smooth and true. Machine to restore proper surface for brushes.

c) Brushes must make good contact with slip rings along the whole face of brush. If needed, grind brushes in with fine sandpaper. Do not use lubricants. Service ports are provided for inspection of slip rings and brushes. Spring pressure is preset at about 1 lb. on 213-286T frames and 4 lbs. on 324-449T frames.

d) Must use same grade of brushes.

START UP

1. Disconnect load and start motor. Check direction of rotation. If rotation must be changed, ALLOW THE MOTOR TO STOP COMPLETELY. Interchange any two leads of a three phase motor. Reconnect a single phase motor per nameplate instructions. Fans on fan cooled motors that have directional rotation nameplate must be reversed on shaft if rotation is changed.

2. Connect load. The motor should start quickly and run smoothly. If not, shut power off at once. Recheck the assembly including all connections before restarting. For single phase motors, also examine capacitor wiring and mechanism for switching between starting and running.

3. If excessive vibration is noted, check for loose mounting bolts, non-flexible motor support structure or transmitted vibration from adjacent machinery. Periodic vibration checks should be made; foundations often settle.

4. Operate under load for short period of time; check operating current against nameplate.

LUBRICATION: BALL OR ROLLER BEARINGS

Grease lubricated bearings as furnished are adequate for a long period of operation without relubrication. A good maintenance schedule for regreasing will vary widely depending on motor size, speed, duty and environment.

Frequency of Relubrication

The following table suggests relubrication intervals for motors on normal, steady, running, light duty indoor loads in relatively clean atmospheres at 40°C (104°F) ambient temperature or less.

Type of Enclosure	Insulation	Frame Size 143 to 215T	Frame Size 254 to 326T	Frame Size 364 to 449T
Open – DP	B	2 yrs.	18 mo.	1 yr.
Enclosed – FC Open – DP	B F	18 mo.	1 yr.	9 mo.
Enclosed – NV Enclosed – FC Open – DP Enclosed – Lint Free – FC	B F H B	1 yr.	9 mo.	6 mo.
Enclosed – NV Enclosed – FC Enclosed – Lint Free – FC	F H F	9 mo.	6 mo.	3 mo.

Note:
FOR MOTORS OVER 1800 RPM – Use 1/2 of tabled period.
FOR SEVERE DUTY – DUSTY LOCATIONS – Use 1/3 of tabled period.

Volume – Reference Table

Shaft Diameter (At Face of Bracket)	Amount of Grease to Add
3/4" to 1-1/4"	1/8 cu. in. or 0.1 oz.
1-1/4" to 1-7/8"	1/4 cu. in. or 0.2 oz.
1-7/8" to 2-3/8"	3/4 cu. in. or 0.6 oz.
2-3/8" to 3-3/8"	2 cu. in. or 1.6 oz.

Type of Grease

Use Westinghouse 5370118Y grease unless a special grease is specified on the nameplate. Some equivalent greases are:

Chevron SRI 2	Standard Oil of California
Dolnus RT	Texaco Inc.
Esso N2	Exxon
Irvania 2	Shell Oil Company
Litholine Premium	American Oil

Procedure for Relubrication

With motor running, stop motor, remove outlet plug, and add amount of grease per reference table with hand lever gun only. Discontinue greasing if grease appears at outlet plug; this may occur before specified amount is used; run for about ten minutes before replacing outlet plug. Certain TEFC motors have a spring relief outlet fitting on the fan end; if the outlet plug is not accessible at surface of motor, it is the spring relief type and need not be removed when greasing.

Caution: Overgreasing is a major cause of bearing and motor failure. Make sure dirt and contaminants are not introduced when adding grease.

LUBRICATION: SLEEVE BEARINGS

Before starting the motor, fill both reservoirs through the filler tube with best quality mineral motor oil. The oil should have a viscosity of from 180 to 200 SSU (equivalent to SAE No. 10). After operation, no oil should be added until it drops below the sight gage, but not flood the bearing. At about 2 year intervals, it is advisable to thoroughly wash out the bearing housing, using hot kerosene or oil.

WARRANTY

Westinghouse warrants that the products sold by it will, upon shipment, be free of defects in workmanship or material. Should any failure to conform to this warranty become apparent during a period of one year after the date of installation or eighteen months from date of shipment, Westinghouse shall, upon prompt written notice from the purchaser, correct such non-conformity by repair or replacement, f.o.b. factory, of the defective part or parts. Correction in the manner provided above shall constitute a fulfillment of all liabilities of Westinghouse with respect to the quality of the products. The foregoing warranty is exclusive and in lieu of all other warranties of quality whether written, oral, or implied (including any warranty of merchantability or fitness for purpose).

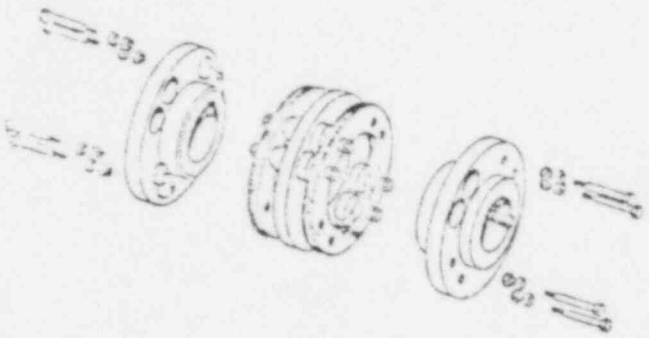
The remedy(ies) provided above shall be purchaser's sole remedy(ies) for any failure of Westinghouse to comply with the warranty provisions, whether claims by the purchaser are based in contract or in tort (including negligence).

Westinghouse Electric Corporation
Motor and Gearing Division, Buffalo, NY 14240
Printed in U.S.A.

INSTALLATION AND ALIGNMENT
FLEXIBLE DISC COUPLINGS

INSTALLATION

Proper enable care in initial assembly and aligning will permit couplings to operate to full capacity in correcting for misalignments. Caution: All rotating power transmission products are potentially dangerous and must be properly guarded for the speeds and applications for which they are intended.

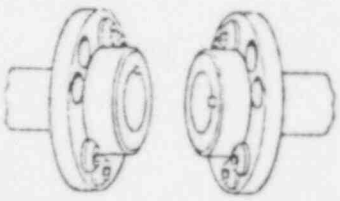


1. Coupling is shipped with center member assembled as shown above. If it is necessary to disassemble the coupling completely, tie a string or wire thru the bolt holes to maintain the dialing (alternating grain of the individual disc). Be careful to note the arrangement of parts.

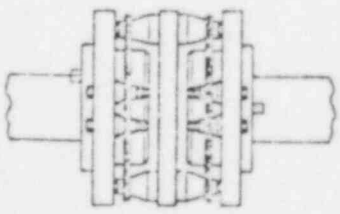
2. Inspect both shafts and hub bores, making sure they are free from burrs. Be sure the keys fit the shafts and hubs properly.

3. Mount hubs on shafts. If hub is bored for an interference fit, they should be heated in water, oil or with soft flame and quickly positioned on the shaft. Do not overheat hub as it may cause distortion.

4. Move equipment to be coupled into position, making sure that the distance between hubs is equal to the "C" dimension given in coupling dimensional tables ("L" dimension on floating shaft coupling types.)



5. Reassemble coupling, placing the proper order of parts as noted in Step 1. Refer to drawings on preceding listing pages.



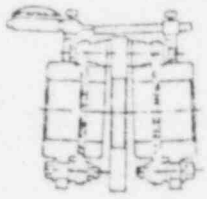
Note that coupling is in alignment.

NOTE: Floating shaft couplings should be mounted close to bearings of connected units to minimize overhang. Cooling tower and other right angle drives—dowel right angle gear boxes to their bases after couplings have been aligned. Right angle gear boxes tend to creep in a counter-rotational direction, which causes severe coupling misalignment and may result in premature failures.

ALIGNMENT

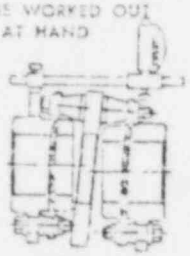
INDICATOR METHOD

INDICATOR MOUNTING TO BE WORKED OUT TO SUIT CONDITIONS AT HAND



CHECK FOR ANGULAR MISALIGNMENT

Dial indicator measures maximum longitudinal variation in hub spacing through 360° rotation.

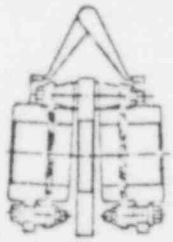


CHECK FOR PARALLEL MISALIGNMENT

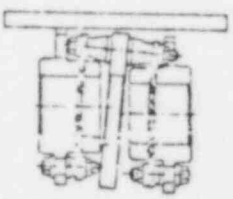
Dial indicator measures displacement of one shaft center line from the other.

1. Attach dial indicator to hub, as with a hose clamp; rotate coupling 360° to locate point of minimum reading on dial; then rotate body or face of indicator so that zero reading lines up with pointer.
2. Rotate coupling 360°. Watch indicator for misalignment reading.
3. Driver and driven units will be lined up when dial indicator reading comes within maximum allowable variation of .002" for each inch of flange diameter.
4. Reset pointer to zero and repeat above operations 1 and 2 when either driven unit or driver is moved during aligning trials.
5. Check for parallel misalignment as shown. Move or shim units so that parallel misalignment is at a minimum.
6. Coupling should be rotated several revolutions to make sure no "end-wise creep" in connected shafts is measured.
7. Tighten all locknuts.
8. Re-check and tighten all locknuts after several hours of operation.

CALIPER AND STRAIGHT EDGE METHOD



CHECK FOR ANGULAR MISALIGNMENT



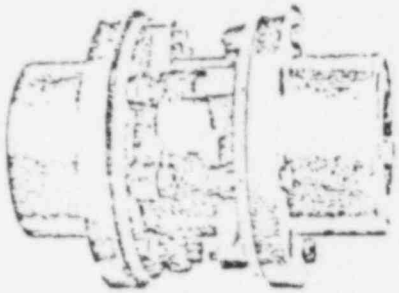
CHECK FOR PARALLEL MISALIGNMENT

1. Use calipers to check the gap between hubs. Gap should be the same at all points around the hub.
2. Place straight edge on the rims at the top and sides. When the coupling is in alignment the straight edge should rest evenly and both disc pack assemblies should be in a perfect plane at right angles to the straight edge.
3. Tighten all locknuts.
4. After several hours of operation recheck gap between hubs, and recheck tightness of all locknuts.
5. When operating at full speed, disc packs should have a clearly defined appearance—not blurred when viewed from top and side.

DOUBLE-FLEXING DISC COUPLINGS

TYPE AMR

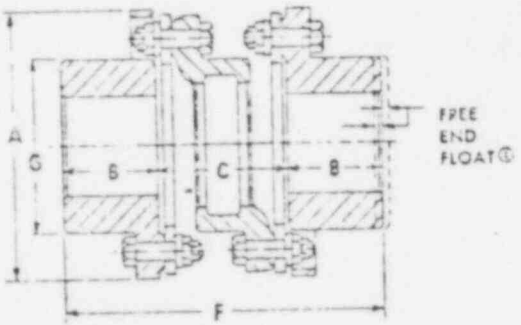
FOR MOTOR AND ENGINE DRIVES



The AMR Coupling has achieved wide usage in the heavy duty slow to medium field. It has all the basic Rexnord features. This type coupling is used extensively on all types of engine and heavy duty motor drives. Driven equipment includes such applications as chippers, calenders, dredges, all types of mills, reciprocating compressors, etc.

Material Specifications:

All hubs cast alloy iron; Center Members: Sizes 162-450 — cast alloy iron; Sizes 500-1550 — cast steel. Flexing elements are of Tomaloy steel although stainless steel is recommended for corrosion resistance and where maximum reliability is desired.



Maximum Horsepower per 100 RPM

Size No.	SERVICE COLUMN 2	3	4	5	6
162	2.9	2.0	1.7	1.4	1.2
200	5.9	3.9	3.3	2.8	2.4
225	8.6	5.7	4.8	4.1	3.6
262	14.9	9.9	8.3	7.1	6.2
312	21.0	16.0	13.3	11.4	10.0
350	33.5	22.4	18.6	16.0	13.9
375	51.7	34.5	28.7	24.6	21.5
425	68.0	45.3	37.7	32.4	28.3
450	87.6	58.4	48.7	41.7	36.5
500	134	89.3	74.4	63.8	55.8
550	196	131	109	93.3	81.7
600	274	182	152	130	114
700	422	282	235	201	176
750	545	363	302	260	227
800	697	464	387	332	290
850	868	577	481	412	361
925	1160	774	644	553	484
1000	1460	973	812	696	609
1100	1760	1170	977	838	734
1200	2310	1540	1280	1100	963
1300	2760	1840	1530	1315	1150
1550	3700	2400	2000	1720	1500

General Dimensions

Size No.	Max. Bore	Max. R.P.M.	A	B	C	G	F	Approx. Wt.②	WR²②
162	1⅝	1800	4¹⁹/₃₂	1¾	2⅝	2¾	6⅛	13	21
200	2	1500	5¾	2⅛	3	3⅜	7¼	20	58
225	2¼	1500	6	2½	3	3⅞	8	23	78
262	2⅝	1800	6⅞	2⅞	3½	4½	9¼	33	160
312	3⅛	1800	8⅛	3⅜	4⅛	5¹⁵/₁₆	10⅞	56	380
350	3½	1800	9⅛	3⅝	4¹⁵/₁₆	6	12¹⁵/₁₆	74	660
375	3¾	1800	10¹/₁₆	4	5⅛	6½	13⅛	110	1,100
425	4¼	1800	11	4¼	5¹⁵/₁₆	7	14¹/₁₆	130	1,600
450	4½	1500	11⅞	4½	5¹⁵/₁₆	7¹⁵/₁₆	14¹/₁₆	160	2,300
500	5	1500	13¹/₁₆	5	6¹¹/₁₆	8⅜	16¹³/₁₆	220	4,100
550	5½	1500	15	5½	7¹¹/₁₆	9⅛	18¹¹/₁₆	300	7,300
600	6	1200	16⅜	6	8⅞	10¹/₁₆	20⅞	390	12,000
700	7	1100	18¹⁵/₁₆	7	9⅝	11¼	23⅝	580	23,000
750	7½	1000	20⅛	7¼	10½	12⅝	25	690	33,000
800	8	900	22⅜	7¾	11⅝	13¾	26⅜	850	48,000
850	8½	850	23¾	8¼	12¼	14½	28⅝	1100	73,000
925	9¼	800	25¾	9	13¼	15⅞	31¼	1300	110,000
1000	10	750	28¼	9½	14½	17⅛	33½	1800	170,000
1100	11	700	30¼	10¼	15½	18½	36	2100	240,000
1200	12	650	33⅜	11	17¹/₁₆	20¼	39¹/₁₆	2500	390,000
1300	13	600	36	12	18⅝	22½	42⅝	3000	Consult Rexnord
1550	15½	570	39¼	14½	19¹³/₁₆	26	48⅞	4900	

For larger sizes, consult Rexnord. For ordering instructions, see page 322.

① These Flexible Disc Couplings meet all NEMA specifications (MG1-14.37) without modification or additional end-float restricting devices. See page 379.
② Weight in pounds and WR² in pound-inches² at maximum bore.

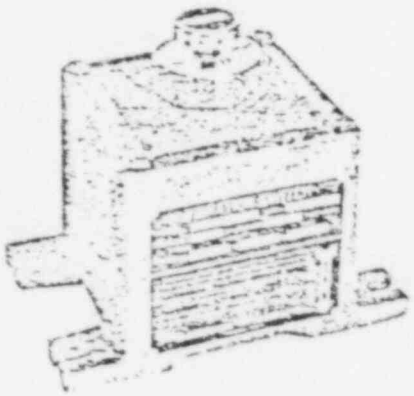
Note: Dimensions subject to change. Certified dimensions of ordered material furnished on request.

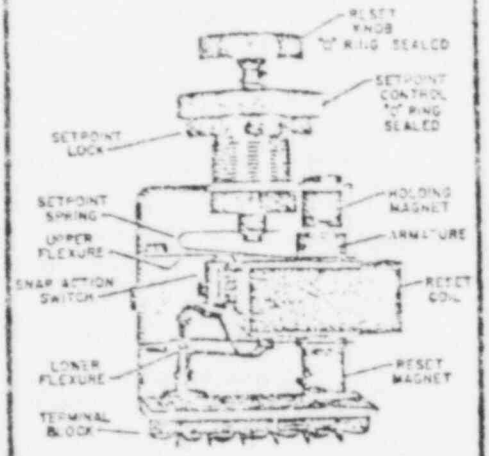
METRIX INSTRUMENT CO.

Listed by Underwriters Laboratories, Inc.

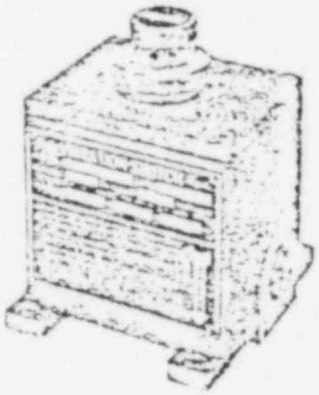
PRECISION VIBRATION SWITCHES MODELS 5078 & 5097

MODEL 5078 EXPLOSION PROOF



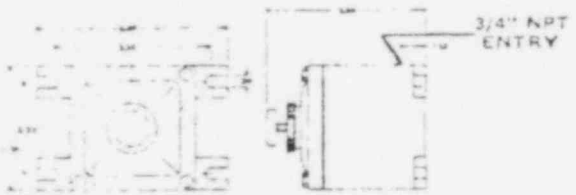


MODEL 5097 WEATHERPROOF

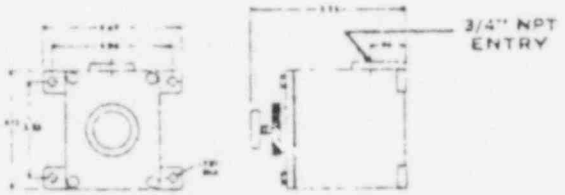


PROTECT CAPITAL MACHINERY FROM DESTRUCTIVE VIBRATION

5000 units are precision adjustable inertia switches which provide reliable vibration and shock protection for rotating or reciprocating equipment by actuating and latching a switch if vibration or shock exceeds a predetermined setpoint. They may be mounted in any plane. A knurled, detented, calibrated knob allows precise setpoint adjustment, after which the knob can be securely locked in place with a set screw. When tripped, the unit can be reset manually with the reset button, or electrically by applying a voltage to the reset coil. Likewise, the unit can be prevented from tripping by holding the reset coil energized. The flexure supported armature provides frictionless action and excellent repeatability. Epoxy encapsulated reset coil and "O" ring sealed through case fittings make Series 5000 Vibration Switches suitable for extended service in hostile environments.



EXPLOSION PROOF – 5078



WEATHER PROOF – 5097

MODEL	RESET COIL	ENCLOSURE	SWITCH RATING	VIBRATION RANGE	OPERATING TEMP.
5078-10	none	Explosion Proof Class I, Group D; Class II, Groups E, F, G Cast Aluminum Wt. 5.4 lbs.	SPDT, 220 VAC, 5 A ind.,	0-5 G's or 0-10 G's @ 0-200 Hz (0-12,000 CPM)	-40°C to +120°C
5078-20	115 VAC				
5078-30	12 VDC				
5078-40	24 VDC				
5078-50	48 VDC				
5078-60	115 VDC				
5078-70	220 VAC				
5097-10	none	Weatherproof NEMA 3, 4, 5 Cast Aluminum Wt. 3.2 lbs.	SPDT, 220 VAC, 5 A ind.,	0-5 G's or 0-10 G's @ 0-200 Hz (0-12,000 CPM)	-40°C to +120°C
5097-20	115 VAC				
5097-30	12 VDC				
5097-40	24 VDC				
5097-50	48 VDC				
5097-60	115 VDC				
5097-70	220 VAC				

For use in very corrosive atmospheres, any of the above units can be supplied with a sealed (10^{-6} cc/sec) vibration switch. Rating: 115 VAC @ 5A. To specify the sealed switch, drop the "0" from the part number suffix, and add $15.00 to the unit price.

UNIT 1 = 01 of 2

HUDSON PRODUCTS CORPORATION

POST OFFICE BOX 36100 HOUSTON, TEXAS 77036 U.S.A.

JOB NO. ND006

CUSTOMER LOUISIANA POWER & LIGHT CO

SHIPPING ADDRESS THIBODAUX, LOUISIANA

CUSTOMER ORDER NO. NY-403479

RECOMMENDED SPARE PARTS LIST FOR HUDSON COOLING EQUIPMENT

ITEM	QUAN.	DESCRIPTION	RECOMMENDED SPARE PARTS					
			PART NO.	NAME	PRICE EA	QUAN.	DEL	EXTENSION
1	30	BPT-MN-6 HUDSON FAN ASSEMBLY, HUB MODEL 3206 24" TAPER BORE 5/16 R2 TYPE 2 BUSHING, BORE 3 5/8						
	30	50 HP, 1800/900 RPM, 400/3/60 WESTINGHOUSE MOTOR FRAME 326 T TEFC-MRC (SHAFT HORIZ.) "T3" OVER SIZE CONDUIT BOX & 230 VOLT SPACE HEATER						
	30	METRIX #5097-60 VIBRATION SWITCH						
	30	PHILADELPHIA IN-LINE DOUBLE GEAR REDUCER BHL2, 8.55 TO 1 RATIO: INPUT SHAFT TO BE 2 7/8" x 0'-4 5/8" LG. 7/2-1/4 K.W. OUTPUT SHAFT TO BE 4 7/16" DIA. 1'-4 3/4" LG. (OUTPUT SHAFT TO BE MACHINED TO 3 5/8" DIA. x 0'-9 1/2" LG. 7/8" K.W. KEYWAY TO TRANSMIT 400 H.P. AT 1800 R.P.M. INPUT SHAFT CONFIGURATION AS PER OUTPUT SHAFT DIMENSIONS, MACHINED TO RESPECTIVE SHAFTS						
	30	THOMAS 225-AMR FLEXIBLE COUPLING, BORE ONE END 2" - 7/2 x 1/4 K.W. & BORE OTHER END 2 5/8" - 7/2 x 1/4 K.W. HUBS TO BE CAST IRON, ASTM A48-64, CLASS 30C, DISCS TO BE STAINLESS STEEL, AISI TYPE 201 OR 301 (HALF HARD CONDITION) ZINC PLATED						

F-30

SHT 01 2

HUDSON PRODUCTS CORPORATION NUCLEAR

POST OFFICE BOX 38100 HOUSTON, TEXAS 77036 U.S.A

DATE 5 24 76 JOB NO 1006 2

CUSTOMER EBASCO/LOUISIANA POWER & LIGHT CO

SHIPPING ADDRESS TAFT, LOUISIANA

CUSTOMER ORDER NO NY-403479

RECOMMENDED SPARE PARTS LIST FOR HUDSON COOLING EQUIPMENT

ITEM	QUAN.	DESCRIPTION	RECOMMENDED SPARE PARTS					
			PART NO.	NAME	PRICE EA.	QUAN.	DEL.	EXTENSION
1	6720	HUDSON HY-FIN TUBES, 1" OD × .085 MW × 48'-0 LG., SA-178,C "710-58" EXTRUDED ALUMINUM FINS						
	60	D3-63C ADAPTER PLUG (1"8-12NF) SA-105						
	13,440	P44 HEX HD SHOULDER PLUG SA-105						
	13,500	1"A × 1"B × 1/16 SHOULDER PLUG GASKET A-366						
						TOTAL		

1. QUANTITIES SHOWN IN COLUMN 2 ARE TOTAL FOR ALL UNITS.
2. TUBE PRICES AVAILABLE ON APPLICATION.
3. PRICES BASED ON QUANTITY RECOMMENDED.
4. PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
5. PRICES ARE F.O.B. SHIPPING POINT AND DO NOT INCLUDE ANY TAXES, DUTY OR EXPORT CRATING.
6. DELIVERY TIME ESTIMATED.
7. MINIMUM ORDER IS $ 25.00.

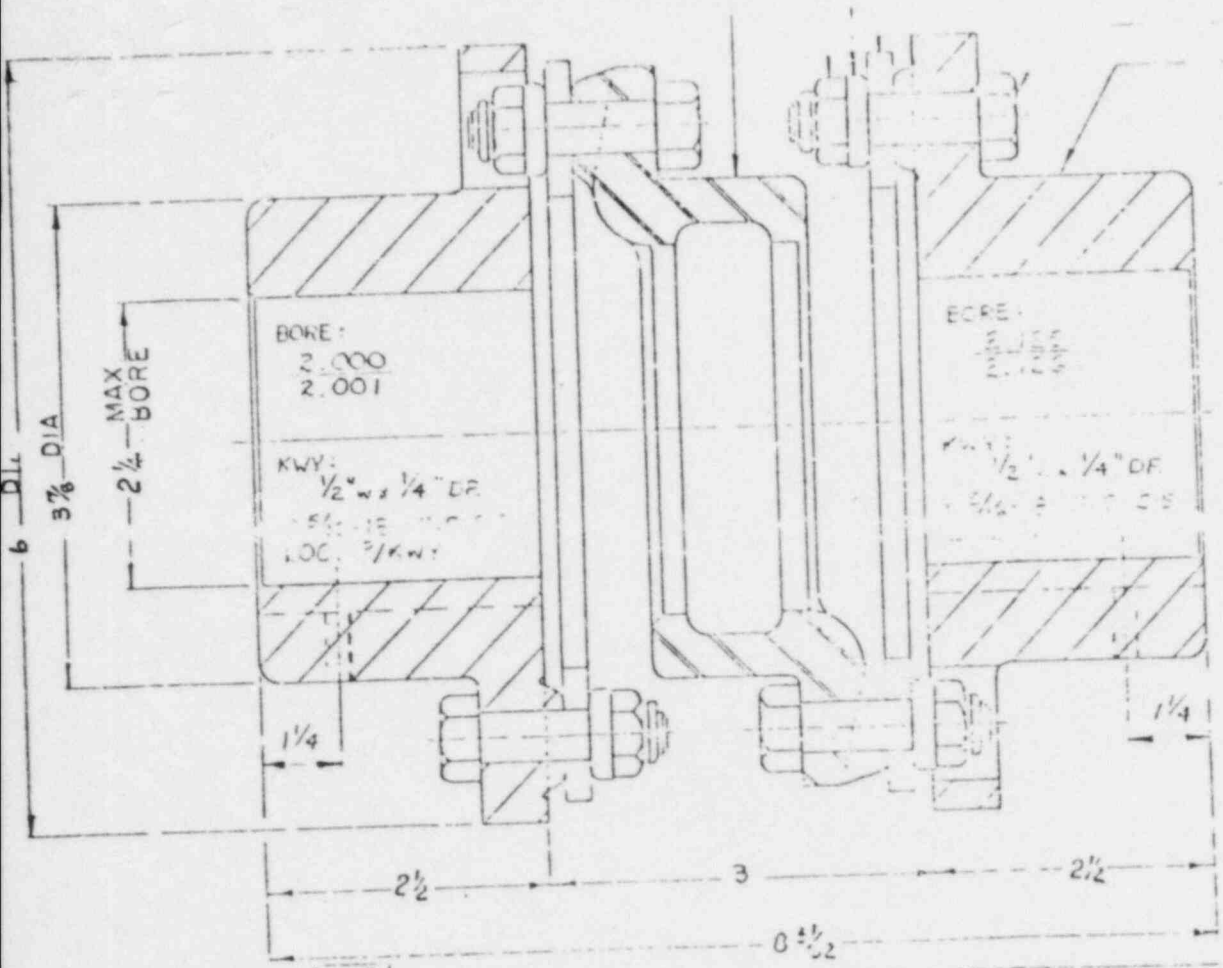
20960
11955 5
11205
10984 .172 THK
11046
22050

22082 A

CERTIFIED PRINT
YOUR P.O. A-12369
OUR ORDER 22-22038-01

REXNORD INC
COUPLING DIVISION
P.O. BOX 549
WARREN, PA. 16365
PER TLO 2-9-77

NOTE:
1. DISC SHALL BE STAINLESS 301 HALF HARD.
2. CPLG TO BE ZINC PLATED



SECTIONAL ASSEMBLY
ST'D NO 225 AMR CPLG.

		A 11/14	SEE RE 510		THOMAS FLEXIBLE COUPLING CO.		22082 A
		B 2½	RE 2624		WARREN PA		
		C			SCALE NONE	DATE 12-11-78	DRAWING NO

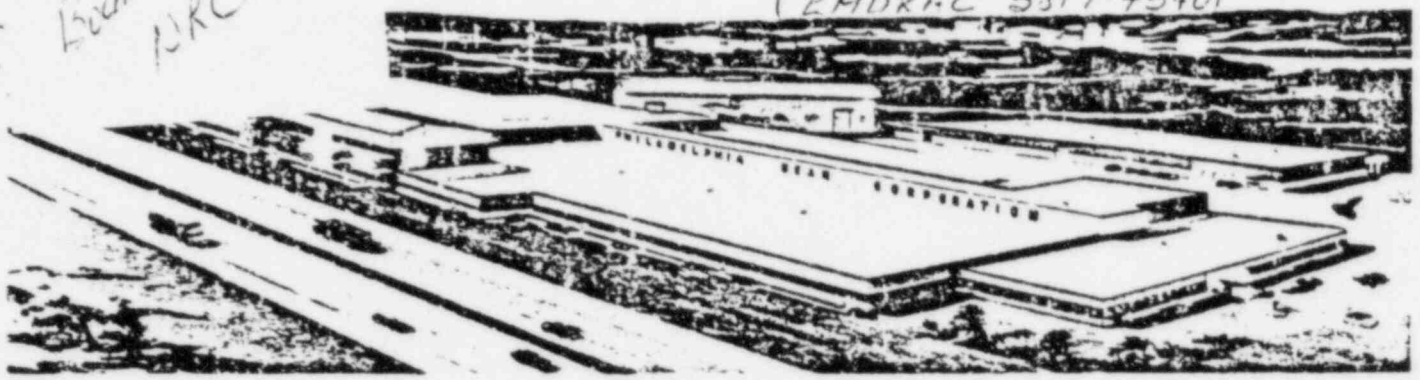
(457000180)

John Beardsman NRC

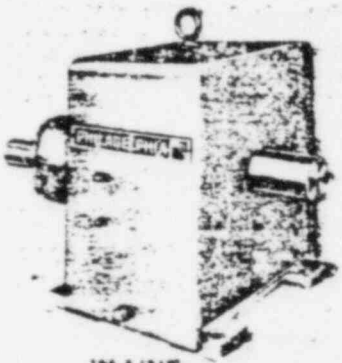
PHILADELPHIA

(EMDRAC* 5817-4340)

GSM-175

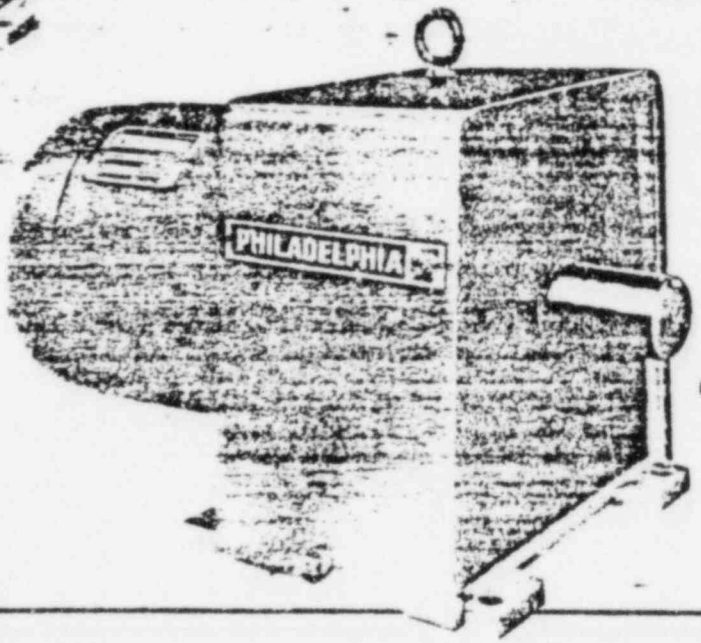


GEARMOTOR SERVICE MANUAL



IN-LINE

MOTOREDUCER



GEARMOTOR

CONTENTS

FOIA-84-206
M/54

AGMA OIL NUMBER SELECTION CHART

FOR PHILADELPHIA GEARMOTORS, MOTOREDUCERS AND IN-LINE REDUCERS (See Note 1)

CONTACT YOUR SUPPLIER FOR TRADE NAME OF LUBRICANT MEETING THESE SPECIFICATIONS

TYPE OF OIL		AMBIENT TEMPERATURE (°F)	
		15-60	50-125
[redacted]	AGMA NUMBER	[redacted]	[redacted]
	VISCOSITY RANGE	280-360 SUV @ 100°F	700-1000 SUV @ 100°F
EXTREME PRESSURE OIL	AGMA NUMBER	[redacted]	4EP
	VISCOSITY RANGE	280-400 SUV @ 100°F	700-1000 SUV @ 100°F

NOTE 1. THESE RECOMMENDATIONS ARE TO BE USED FOR NORMAL INDUSTRIAL SPEED RANGES (SHAFTS NOT EXCEEDING 3600 RPM OR PITCH LINE VELOCITIES NOT EXCEEDING 5000 FEET PER MINUTE). THESE RECOMMENDATIONS ARE NOT TO BE USED FOR GEAR DRIVES OPERATING AT HIGHER SPEEDS. CONSULT FACTORY FOR LUBRICATION RECOMMENDATIONS FOR HIGHER SPEEDS.

NOTE 2. For splash lubrication the oils listed above are suitable for start-up temperatures as low as 15° F. However, in units where a pump supplies forced feed lubrication, the above lubricants should only be used for start-up to 40°F. Below 40°F, heaters should be used to preheat oil before starting, or suitable special oils utilized. For other low temperature starting and operating recommendations, see Page 5.

TYPES OF LUBRICANT

1. The recommended types of oil for use in Philadelphia Gear units are either straight mineral oil or extreme pressure (EP) oil of specifications shown above. In general, the straight mineral oil should be a high grade, well refined petroleum oil within the recommended viscosity range. It must be neutral in reaction and must not be corrosive to gears and ball or roller bearings. It should have good defoaming properties and good resistance to oxidation for high operating temperatures.

Philadelphia units that are subjected to heavy shock, impact loading, or extremely heavy duty, should use an extreme pressure (EP) lubricant. Extreme pressure (EP) gear lubricants are petroleum based lubricants containing special chemical additives. EP lubricants recommended are those containing [redacted] sulfur-phosphorous additives. Sulfur-phosphorous type EP oils are generally more stable than lead naphthenate type oils and may be used to a maximum sump temperature of 190°F. [redacted]

[redacted] USE YEAR ROUND

DO NOT USE EP OILS IN UNITS EQUIPPED WITH BUILT-IN BACKSTOPS OR IN AN EXTERNAL BACKSTOP.

IN GENERAL, IF UNITS ARE SUBJECTED TO UNUSUALLY HIGH AMBIENT TEMPERATURES (110°F. OR OVER), EXTREME HUMIDITY OR ATMOSPHERIC CONTAMINANTS, USE THE STRAIGHT MINERAL OIL RECOMMENDED.

GREASE LUBRICATION

Lubricants should be high grade, non-separating, ball bearing grease suitable for operating temperatures to —150 degrees F. Grease to be N.L.G.I. Number 2 consistency.

Grease lubricants must be non-corrosive to ball or roller bearings, and must be neutral in reaction. It should contain no grit, abrasive, or fillers, should not precipitate sediment; should not separate at temperatures up to 300 degrees F.; and should have moisture resistant characteristics. The lubricant must also have good resistance to oxidation.

TROUBLE SHOOTING CHART

TROUBLE	WHAT TO INSPECT	ACTION
Overheating	1. Unit overloaded.	Reduce the loading or replace with drive of sufficient capacity.
	2. Oil cooler operation.	Check coolant and oil flow. Vent system of air. Oil temperatures into unit should be approximately 110 degrees F. Check cooler internally for build up of deposits from coolant water.
	3. Has recommended oil level been exceeded or is level too low?	Check oil level indicator to see that housing is accurately filled with lubricant to the specified level.
	4. Are bearings properly adjusted?	Bearings must not be pinched. Adjustable tapered bearings must be set at proper bearing lateral clearance. All shafts should spin freely when disconnected from load.
	5. Oil seals or stuffing box.	Oil seals should be greased on those units having grease fitting for this purpose. Otherwise, apply small quantity of oil externally at the lip until the seal is run in. Stuffing box should be gradually tightened to avoid overheating. Packing should be a self-lubricating, braided asbestos type.
	6. Breather.	Breather should be open and clean. Clean breather regularly in a solvent.
	7. Grade of oil.	Oil must be of grade specified in lubrication instructions. If it is not, clean unit and refill with correct grade.
	8. Condition of oil.	Check to see if oil is oxidized, dirty, or of high sludge content, change oil and clean filter.
	9. Forced feed lubrication system.	Make sure oil pump is functioning. Check that oil passages are clear and permit free flow of lubricant. Inspect oil line pressure regulators, nozzles and filters to be sure they are free of obstructions. Make sure pump suction is not sucking air.
	10. Coupling alignment.	Disconnect couplings and check alignment. Realign as required.
	11. Coupling lateral float.	Adjust spacing between drive motor, etc., to eliminate end pressure on shafts. Replace flexible coupling with type allowing required lateral float.
	12. Speed of unit excessive?	Reduce speed or replace with drive suitable for speed.
Shaft Failure	1. Type of coupling used.	Rigid couplings between rigidly supported shafts can cause shaft failure. Replace with coupling to provide required flexibility and lateral float.
	2. Coupling alignment.	Realign equipment as required.
	3. Is overhung load excessive?	Reduce overhung load. Use outboard bearing or replace with unit having sufficient capacity.
	4. Is unit overloaded?	Reduce the loading or replace with drive of sufficient capacity.
	5. Is unit subjected to high energy starts or extreme repetitive angles?	Apply couplings capable of absorbing impact and if necessary replace with drive of sufficient capacity to withstand shock loads.
	6. Torsional or lateral vibration condition.	These vibrations can occur through a particular speed range. Reduce speed to at least 20% below critical speed. System modifications or characteristics can be adjusted to lower critical speed (stiffness, necessary additional weight as well as shaft stiffness, length and diameter). For specific recommendations contact factory.
	7. Is outboard bearing properly aligned?	Realign bearing as required.

AGMA OIL NUMBER SELECTION CHART

FOR PHILADELPHIA GEARMOTORS, MOTOREDUCERS AND IN-LINE REDUCERS (See Note 1)

CONTACT YOUR SUPPLIER FOR TRADE NAME OF LUBRICANT MEETING THESE SPECIFICATIONS

TYPE OF OIL		AMBIENT TEMPERATURE (°F)	
		15-60	50-125
[redacted]	AGMA NUMBER	[redacted]	[redacted]
	VISCOSITY RANGE	280-360 SUV @ 100°F	700-1000 SUV @ 100°F
EXTREME PRESSURE OIL	AGMA NUMBER	[redacted]	4EP
	VISCOSITY RANGE	280-400 SUV @ 100°F	700-1000 SUV @ 100°F

[redacted] USE YEAR ROUND

NOTE 1. THESE RECOMMENDATIONS ARE TO BE USED FOR NORMAL INDUSTRIAL SPEED RANGES (SHAFTS NOT EXCEEDING 3600 RPM OR PITCH LINE VELOCITIES NOT EXCEEDING 5000 FEET PER MINUTE). THESE RECOMMENDATIONS ARE **NOT** TO BE USED FOR GEAR DRIVES OPERATING AT HIGHER SPEEDS. CONSULT FACTORY FOR LUBRICATION RECOMMENDATIONS FOR HIGHER SPEEDS.

NOTE 2. For splash lubrication the oils listed above are suitable for start-up temperatures as low as 15° F. However, in units where a pump supplies forced feed lubrication, the above lubricants should only be used for start-up to 40° F. Below 40° F. heaters should be used to preheat oil before starting, or suitable special oils utilized. For other low temperature starting and operating recommendations, see Page 5.

TYPES OF LUBRICANT

1. The recommended types of oil for use in Philadelphia Gear units are either straight mineral oil or extreme pressure (EP) oil of specifications shown above. In general, the straight mineral oil should be a high grade, well refined petroleum oil within the recommended viscosity range. It must be neutral in reaction and must not be corrosive to gears and ball or roller bearings. It should have good defoaming properties and good resistance to oxidation for high operating temperatures.

Philadelphia units that are subjected to heavy shock, impact loading, or extremely heavy duty, should use an extreme pressure (EP) lubricant. Extreme pressure (EP) gear lubricants are petroleum based lubricants containing special chemical additives. EP lubricants recommended are those containing [redacted] sulfur-phosphorous additives. Sulfur-phosphorous type EP oils are generally more stable than lead naphthanate type oils and may be used to a maximum sump temperature of 180°F. [redacted]

DO NOT USE EP OILS IN UNITS EQUIPPED WITH BUILT-IN BACKSTOPS OR IN AN EXTERNAL BACKSTOP.

IN GENERAL, IF UNITS ARE SUBJECTED TO UNUSUALLY HIGH AMBIENT TEMPERATURES (110°F. OR OVER), EXTREME HUMIDITY OR ATMOSPHERIC CONTAMINANTS, USE THE STRAIGHT MINERAL OIL RECOMMENDED.

GREASE LUBRICATION

Lubricants should be high grade, non-separating, ball bearing grease suitable for operating temperatures to −150 degrees F. Grease to be N.L.G.I. Number 2 consistency.

Grease lubricants must be non-corrosive to ball or roller bearings, and must be neutral in reaction. It should contain no grit, abrasive, or fillers; should not precipitate sediment; should not separate at temperatures up to 300 degrees F.; and should have moisture resistant characteristics. The lubricant must also have good resistance to oxidation.

TROUBLE SHOOTING CHART

TROUBLE	WHAT TO INSPECT	ACTION
Overheating	1. Unit overloaded.	Reduce the loading or replace with drive of sufficient capacity.
	2. Oil cooler operation.	Check coolant and oil flow. Vent system of air. Oil temperatures into unit should be approximately 110 degrees F. Check cooler internally for build up of deposits from coolant water.
	3. Has recommended oil level been exceeded or is level too low?	Check oil level indicator to see that housing is accurately filled with lubricant to the specified level.
	4. Are bearings properly adjusted?	Bearings must not be pinched. Adjustable tapered bearings must be set at proper bearing lateral clearance. All shafts should spin freely when disconnected from load.
	5. Oil seals or stuffing box.	Oil seals should be greased on those units having grease fitting for this purpose. Otherwise, apply small quantity of oil externally at the lip until the seal is run in. Stuffing box should be gradually tightened to avoid overheating. Packing should be a self-lubricating, braided asbestos type.
	6. Breather?	Breather should be open and clean. Clean breather regularly in a solvent.
	7. Grade of oil.	Oil must be of grade specified in lubrication instructions. If it is not, clean unit and refill with correct grade.
	8. Condition of oil.	Check to see if oil is oxidized, dirty, or of high sludge content, change oil and clean filter.
	9. Forced feed lubrication system.	Make sure oil pump is functioning. Check that oil passages are clear and permit free flow of lubricant. Inspect oil line pressure regulators, nozzles and filters to be sure they are free of obstructions. Make sure pump suction is not sucking air.
	10. Coupling alignment.	Disconnect couplings and check alignment. Realign as required.
	11. Coupling lateral float.	Adjust spacing between drive motor, etc., to eliminate end pressure on shafts. Replace flexible coupling with type allowing required lateral float.
	12. Speed of unit excessive?	Reduce speed or replace with drive suitable for speed.
Shaft Failure	1. Type of coupling used.	Rigid couplings between rigidly supported shafts can cause shaft failure. Replace with coupling to provide required flexibility and lateral float.
	2. Coupling alignment.	Realign equipment as required.
	3. Is overhung load excessive?	Reduce overhung load. Use outboard bearing or replace with unit having sufficient capacity.
	4. Is shaft overloaded?	Reduce the load or replace with unit of sufficient capacity.
	5. Is unit subjected to high energy loads or extreme inertia loads?	Apply [illegible] to absorb [illegible] and [illegible] with drive unit [illegible] to minimize stress.
	6. Possibility of shaft whirl or resonance.	[illegible] conditions can occur through a particular speed range. Passage speed to [illegible] by critical speed. System must [illegible] can be [illegible] to operate [illegible] speed position. [illegible] necessary to use [illegible] as short as [illegible] [illegible] for specific recommendations consult factory.
	7. Is shaft bent due to [illegible] load?	Straighten or replace as required.

MATERIAL TECHNICAL RESOLUTION

APPROVAL

MULTI-PURPOSE

TO: File (Procurement Package)

FROM: Plant Engineering W. P. Clare 10-17-83
(Cognizant Engineer)

P.O. # L01462 VENDOR Fisher Valve

Check Use ☑

In accordance with the findings and recommendations presented by Burns and Roe, Inc., all technical deficiencies in Procurement evaluations/packages listed on the Procurement Status Summary have been resolved.

Documentation associated with resolutions are hereby attached to the Procurement Status Summary and will be contained in the permenent Procurement Package.

D.N. # General Information L?&L Evaluation of B&R review.

Correspondance

Check Use ○

In cases resulting in recommended Material Acceptance, but where comments exist regarding future status, requirements or specifications; the Technical Review personnel should review the Procurement Status Summary in the original package prior to or at the time of re-order.

FOIA-84-206
MP5

Procurement Status Summary: Open.

P.O. No. LC1462 Force 4/24/83

Recommend PE review & determine specific reqmts.

General Description of Material Ordered: Spare parts for Filter Control Valves.

Nuclear Plant Related	Yes ✓	No
Safety Related	Yes ✓	No
IN Document Matrix	Yes	No ✓

William J. Hayes — Cognizant Engineer — 12/15/82 Date

David B Beckwith — CA Engineer — 12/16/82 Date

Specified Requirements:

Acceptable	✓	(See Attachment)
Over-Specified		(See Attachment)
Under-Specified		(See Deficiency List)

Document Review

Acceptable		
Unacceptable		(See Deficiency List)
Unavailable	✓	(See Deficiency List)

Material Acceptable for Intended Application

Yes ✓

No ✓ (See Deficiency List. (All drgs, spec and pkg item assembly)

Material presently undergoing Quality Engineering Evaluation. No further action required. For further detail see LIFE evaluation attached. William J. Hayes

William J. Hayes — Signature of Engineer — 12/16/82 Date

Lowell A Beckwith — Signature of CA Engineer — 12/16/82 Date

Attachment

P.O. No. 1-01462

Part No. or Description (when appropriate)

1. Purchase order should be more difinitive in that it should identify which parts fall under the jurisdiction of ASME III.

Deficiency List

P.O. No. L01462

Part No. or Description (when appropriate)

Plug, Stem and Plug/Stem assemblies.

Specified Requirements:	Reason	Recommendation
Document Review Fisher has supplied only a Cert. of Conformance for all parts. Other	Per ASME III NB, NC, ND-2110, valve discs are considered pressure retaining and therefore fall under the jurisdiction of ASME III. Per the original C.E. specification, the valves are Class 1, 2 and 3. Therefore as a minimum CMTR, Non Distructive Test results, Cert. of Compliance are required. Referring to Code Case N62-2 as guidance, it classifies the disc (plug) and disc (stem) as catagory 3. Each part requires a CMTR, non destructive exam. and impact testing where applicable, and material identification.	All plug, stem and plug/stem assemblies are not supported with the proper documentation and are therefore unacceptable for their intended use. All other parts supplied are acceptable.

P.O. L01462

SUBJECT: Burns & Roe Procurement Status Summary - LP&L Review

In reviewing the subject purchase order file I can only conclude that none of the material was received at the time of the Burns & Roe review (11/15/82). Fisher just sent in the complete order which is presently undergoing a complete QC receipt inspection as per the LP&L site material receipt inspection procedures. Therefore, there is no deficiency against this purchase orier and QC inspection will determine if the material is acceptable for its intended function. In reviewing Burns & Roe recommendation which suggests that future purchase orders be more definitive as to the required documentation, the purchase order procedures now requires a document retention schedule be included in the purchase order packages to the vendor.

Therefore, this review is complete with no further action required.

William J. Hayes

William J. Hayes 10/14/83

Procurement Status Summary

P.O. No. -2496 L194 BTD

General Description of Material Ordered: Split Backing Rings for Pipe Welding

Nuclear Plant Related	Yes ✓	NO
Safety Related	Yes	NO ✓
QA Document Matrix	Yes	NO ✓

W. J. Wilson & Hayes — Cognizant Engineer — 2/16/83 Date

Donald E Eastman — QA Engineer — 2/16/83 Date

Specified Requirements:

Acceptable	✓	
Over-Specified		(See Attachment)
Under-Specified		(See Deficiency List)

Document Review — P.O not available as of 2/16/83

Acceptable		
Unacceptable		(See Deficiency List)
Unavailable		(See Deficiency List)

Material Acceptable for Intended Application

Yes _____

No _____ (See Deficiency List)

[illegible] — Cognizant Engineer — 2/16/83 Date

[illegible] — QA Engineer — 2/16/83 Date

MATERIAL TECHNICAL RESOLUTION

APPROVAL

MULTI-PURPOSE

TO: File (Procurement Package)

FROM: Plant Engineering J. Thuel 10-14-83
(Cognizant Engineer)

P.O. # L 21624 VENDOR Ingersoll Rand

Check Use ◯

In accordance with the findings and recommendations presented by Burns and Roe, Inc., all technical deficiencies in Procurement evaluations/packages listed on the Procurement Status Summary have been resolved.

Documentation associated with resolutions are hereby attached to the Procurement Status Summary and will be contained in the permenent Procurement Package.

D.N. # General Information

Correspondence

Check Use ◯

In cases resulting in recommended Material Acceptance, but where comments exist regarding future status, requirements or specifications; the Technical Review personnel should review the Procurement Status Summary in the original package prior to or at the time of re-order.

Other ✓

Burns and Roe made recommendations only in this package, no deficiencies identified, no further action required.

FOIA-84-206
M/56

Procurement Status Summary

P.O. No. L-21624

General Description of Material Ordered: Spare Parts for Low Pressure Safety Injection Pump

Nuclear Plant Related	Yes ✓	NO
Safety Related	Yes	NO ✓
ER Document Matrix	Yes	NO ✓

William J. Hayes — Cognizant Engineer — 2/9/83 Date

Carl Liebler — QA Engineer — 2/9/83 Date

Specified Requirements:

Acceptable		
Over-Specified	✓	(See Attachment)
Under-Specified		(See Deficiency List)

Document Review Material not received as of 2/9/83

Acceptable		
Unacceptable		(See Deficiency List)
Unavailable		(See Deficiency List)

Material Acceptable for Intended Application

Yes

No (See Deficiency List)

William J. Hayes — Cognizant Engineer — 2/9/83 Date

Carl Liebler — QA Engineer — 2/9/83 Date

I do not concur. No further action required.
See attached LP&L evaluation for further detail
William J. Hayes. 10/12/83

Attachment

P.O. No. L21624

Part No. or Description (when appropriate)

The spare parts furnished under this Purchase Order are not within the jurisdiction of ASME Code, Section III, Article NC-2110. In reviewing the resolution of the major exceptions which have been made part of the purchase order, it has deleted all Certificate of Conformance requirements. However, as a guideline, Burns and Roe has been using the ASME Code Case N-119-4 to dictate the required documentation for the spare parts ordered. As an example, the Code Case recommends a CMTR to be supplied with Impeller Nuts and Locking Pins.

Future Purchase Orders should be downgraded to Non-Safety Related/QA Required.

P.O. L 11624

SUBJECT: Burns & Roe Procurement Status Summary - LP&L Review

The resolution to the major exception dated 1/20/82 deleted the Certificate of Conformance requirements (Para. 2, Pg 2) as indicated in the B&R review but item G on page 3 of 3 of the major exception imposes new Certificate of Conformance requirements. Therefore, the subject purchase order as presently written is acceptable since the parts are non-code as indicated in Ingersoll-Rand letter dated 12/15/82. I do not agree with the B&R comment in downgrading the purchase order to Non-Safety Related/QA Required since these parts are used in a safety class component and have NCA 3800, Appendix B to 10CFR50 and ANSI N-45.2.9 requirements imposed on them.

Therefore, no further action required since purchase order as presently written is acceptable in procuring acceptable non-code spare parts for the Low Pressure Safety Injection Pump.

William J. Hayes

William J. Hayes 10/12/83

MATERIAL TECHNICAL RESOLUTION

APPROVAL

MULTI-PURPOSE

TO: File (Procurement Package)

FROM: Plant Engineering M. F. Thuet 10-12-83
(Cognizant Engineer)

P.O. # L 22654 VENDOR Keystone Valves

Check Use ◯

In accordance with the findings and recommendations presented by Burns and Roe, Inc., all technical deficiencies in Procurement evaluations/packages listed on the Procurement Status Summary have been resolved.

Documentation associated with resolutions are hereby attached to the Procurement Status Summary and will be contained in the permenent Procurement Package.

D.N. # _____ General Information _____

Correspondence _____

Check Use ☑

In cases resulting in recommended Material Acceptance, but where comments exist regarding future status, requirements or specifications; the Technical Review personnel should review the Procurement Status Summary in the original package prior to or at the time of re-order.

Procurement Status Summary

P.O. No. L22657

Brief Description of Material Ordered: Spare parts for Pressurizer Spray Bypass Valve Actuator

Nuclear Plant Related	Yes ✓	No ____
Safety Related	Yes ____	No ✓
DR Document Matrix	Yes ____	No ✓

William J. Hayes — Cognizant Engineer — 2/4/83 Date

[illegible] — QA Engineer — 2/8/83 Date

Specified Requirements:

Acceptable ____

Over-Specified ✓ (See Attachment)

Under-Specified ____ (See Deficiency List)

Document Review MATERIAL NOT RECEIVED 2/8/83.

Acceptable ____

Unacceptable ____ (See Deficiency List)

Unavailable ____ (See Deficiency List)

Material Acceptable for Intended Application

Yes ____

No ____ (See Deficiency List)

William J. Hayes — Cognizant Engineer — 2/8/83 Date

[illegible] — QA Engineer — 2/9/83 Date

I concur with detecting ASME III must do not downgrade
See attached LP&L evaluation for further detail. 10/14/83
William J. Hayes

ATTACHMENT

P.O. No. 12654

Part No. or Description (when appropriate)

The spare parts furnished under this Purchase Order are not within the jurisdiction of the ASME Code, as stated in Section III, Article NB/NC/ND-2110.

All future Purchase Orders should be downgraded to Non Safety Related/QA Required and should not include the ASME Section III requirements.

P.O. L02654

SUBJECT: Burns & Roe Procurement Status Summary - LP&L Review

I concur with the Burns & Roe recommendation to delete the ASME Section III reference since the items in this purchase order are not within the jurisdiction of ASME III but due to LP&L material control procedures I recommend maintaining the Safety Related/QA Required heading on future purchase orders.

Future purchase orders should therefore delete the paragraph which references ASME SectionIII.

William J. Hayes 10/14/83

PURCHASE ORDER

VENDOR	%	Item	Stock/Item No. Acct	Sub.	Location Charged	Account No. Main	Sub.	Spec. ER or WA/JO	Veh. No. or Other	Location Assigned	Type Cost	Tax Code	Amount
Kerotest Manufacturing Company 2525 Liberty Avenue Pittsburgh, Pa. 15222			94	30		183	5	58318				CH	

SHIP TO: Louisiana Power & Light Company
Waterford #3 Nuclear MAIL BY S. Lockett
Hwy. 18 Taft, La. 70066
Attn. LP&L Warehouse (Tag L-22654-D)

LOUISIANA POWER & LIGHT
(504) 366-2345
142 DELARONDE STREET
NEW ORLEANS, LOUISIANA 70174

PURCHASE ORDER No. L 22654 P

F.O.B.	SHIP VIA	REQUISITION No.	ORDER DATE	SHIPPING DATE
Pittsburgh, Pa.	Cheapest Way	10954	1/4/83	4 weeks

This is an order from a tax paying, business managed utility company.

Please furnish the material, supplies, equipment and/or services specified on this order, subject to the conditions noted below.

Stock/Item No.	Quantity	Unit	DESCRIPTION	Unit Price	Extension
			Valve parts, per attached 4 sheets and "Louisiana Power and Light Conformance Certificate".		
			NOTE: For your quotation, all items have indefinite shelf life provided original packaging intact.		
			NOTE: LP&L Terms & Conditions, copy attached, shall apply.		
			Agreeable with your quotation KU-241-82 dated 10/25/82.		

DE/DY/lc

COPY FOR_____

PURCHASE REQUISITION

Safety Related/QA Re red - Catalog

No. 10954

LOUISIANA POWER & LIGHT

15 April 1980

Order No. L-22654

PASSED

OCT 14 '82

CSD

Purchasing and Material Manager:
Please order the material, supplies, equipment and/or services listed below: --

ACCOUNT TO BE CHARGED

%	ITEM	ACCT. NO.	SUB.	LOCATION CHARGED	ACCOUNT NUMBER MAIN	SUB.	SPECIFIC NO. OR MAJOR	VEHICLE NO. OR MINOR	LOCATION ASSIGNED	EST. COST	CC CODE	AMOUNT
		04	30		83	5	58318				CH	

SHIP TO: Louisiana Power & Light Company
D.B. Lester/S.A. Alleman
Waterford #3 - Nuclear
Hwy. 18, Taft, LA 70066
Attn: LP&L Warehouse - H. Cannevier

USE OR JOB DESCRIPTION: Orig. Dept. - Mech. Maint.

(T. Pastor)

FOR PURCHASING USE ONLY

FOR PURCHASING USE ONLY

SHIP VIA ☐ RAILROAD FREIGHT ☐ CHEAPEST WAY ☐ MOTOR FREIGHT

REQUIRED DELIVERY DATE 19 ☒ NORMAL

STOCK/ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ITEM NO.	LEAVE BLANK FOR PURCHASING
			The items ordered are for the Kerotest Manufacturing Corp. Pressurizer Spray Bypass Valves, serial numbers HD-9-1 and HD-9-2, originally purchased under Combustion Engineering purchase order number 9301128 per Combustion Engineering specification number 00000-PE-707, rev. 0 and Combustion Engineering specification number 9270-PE-708, rev. 2 , Kerotest Dwg. LA-10092-1.		
100-9990	2	set	Packing, valve stem Part number 9642-6G (9642-6G-SET/72525439		12.00
" "	2	set	Diaphragm Part number 22-6X (22-6X-SET/-7252535)		4.40

Q. A. REQUIRED

Page 1 of 24

PURCHASE REQUISITION

No. 10954

LOUISIANA POWER & LIGHT

Order No

ACCOUNT TO BE CHARGED

SHIP TO: Louisiana Power & Light Company

USE OR JOB DESCRIPTION

FOR PURCHASING USE ONLY

FOR PURCHASING USE ONLY

SHIP VIA ☐ RAILROAD FREIGHT ☐ CHEAPEST WAY ☐ MOTOR FREIGHT

REQUIRED DELIVERY DATE _____ 19___ ☐ NORMAL

STOCK ITEM NO	QUANTITY	UNIT	DESCRIPTION	ITEM $	LEAVE BLANK FOR PURCHASING
			The vendor/manufacturer shall provide a Certificate of Conformance stating that the item(s) ordered herein is of equal or superior configuration, material and quality, and is made to perform the same service as the corresponding item(s) furnished with the original equipment. This Certificate of Conformance is in addition to any Certified Material Test Reports, Certificates of Conformance, or Data Reports required to be furnished with the item(s) by the applicable portions of the ASME Boiler and Pressure Vessel Code, Section III. For all Certificates of Conformance provided by the vendor/manufacturer with this purchase order, the vendor/manufacturer shall provide a list of those documents, tests, inspections and reports as generated during manufacture of the item(s). Furthermore, this list shall delineate those documents to be provided to the purchaser prior to or upon receipt of the item(s) by Louisiana Power & Light. No substitutions are authorized. Should the vendor/manufacturer be unable to fill this purchase order exactly as written, the vendor/manufacturer shall promptly notify Louisiana Power & Light Company in writing prior to		

Q. A. REQUIRED

PURCHASE REQUISITION

No. 10954

LOUISIANA
POWER & LIGHT

Order No

ACCOUNT TO BE CHARGED

SHIP TO

Louisiana Power & Light Company

FOR PURCHASING USE ONLY

FOR PURCHASING USE ONLY:

SHIP VIA ☐ RAILROAD FREIGHT ☐ CHEAPEST WAY
☐ MOTOR FREIGHT

REQUIRED DELIVERY DATE
19

☐ NORMAL

STOCK ITEM NO	QUANTITY	UNIT	DESCRIPTION	ITEM $	LEAVE BLANK FOR PURCHASING
			proceeding with the questionable item. Such notification shall provide a statement of the change and justification for attesting to the functional equivalency of the item to that furnished with the original equipment. Alteration or modification of the requirements of this purchase order can be made only by a written change to this purchase order. When the item(s) ordered has a limited shelf life or other condition that renders it unfit for its intended service after a period of time in normal warehouse storage, the item(s) shall be marked with material type and cure date, or the following statement: "LIMITED SHELF LIFE ITEM Do not use after the following date: _____."		

Q. A. REQUIRED

Page 3 of 5a

PURCHASE REQUISITION

No. 10954

LOUISIANA
POWER & LIGHT

Order No

19

ACCOUNT TO BE CHARGED

USE OR JOB DESCRIPTION

Louisiana Power & Light Company

FOR PURCHASING USE ONLY

FOR PURCHASING USE ONLY

SHIP VIA ☐ RAILROAD FREIGHT ☐ CHEAPEST WAY
☐ MOTOR FREIGHT

REQUIRED DELIVERY DATE 19 ___ ☐ NORMAL

STOCK ITEM NO	QUANTITY	UNIT	DESCRIPTION	U/PRICE	EXTENSION FOR PURCHASING
			proceeding with the questionable item. Such notification shall provide a statement of the change and justification for attesting to the functional equivalency of the item to that furnished with the original equipment. Alteration or modification of the requirements of this purchase order can be made only by a written change to this purchase order. When the item(s) ordered has a limited shelf life or other condition that renders it unfit for its intended service after a period of time in normal warehouse storage, the item(s) shall be marked with material type and cure date, or the following statement: "LIMITED SHELF LIFE ITEM Do not use after the following date: _____."		

Q. A. REQUIRED

PURCHASE REQUISITION

No. 10954

LOUISIANA
POWER & LIGHT

19 Order No.

Purchasing and Material Manager:
Please order the material, supplies, equipment and/or services listed below

ACCOUNT TO BE CHARGED

%	UNIT	LOCATION SUB. ACCT.	LOCATION SUB.	LOCATION CHARGED	ACCOUNT NUMBER MAIN	ACCOUNT NUMBER SUB.	SELLING AN ORDER NO.	VEHICLE NO. OR ORDER	LOCATION RESPONSIBLE	TAX CODE	TAX CODE	AMOUNT

VENDOR

SHIP TO: Louisiana Power & Light Company

USE OR JOB DESCRIPTION

O.B. FOR PURCHASING USE ONLY

FOR PURCHASING USE ONLY

SHIP VIA ☐ RAILROAD FREIGHT ☐ CHEAPEST WAY ☐ MOTOR FREIGHT

REQUIRED DELIVERY DATE 19 ☐ NORMAL

STOCK/ITEM NO.	QUANTITY	UNIT	DESCRIPTION	ITEM	LEAVE BLANK FOR PURCHASING
			The manufacturer of the items and his sub-tier vendors shall be controlled by a quality assurance program which is at least equivalent to that which was implemented during the manufacture of the original items and which satisfies the intent of 10CFR, Part 50, Appendix B. The provisions of NRC regulation 10CFR, Part 21, "Reporting of Defects and Noncompliance," as applicable, are incorporated herein by reference and are a part of this order. Notices required by 10CFR, Part 21 must be made in conformance with the regulation and addressed to "Louisiana Power and Light Company."		

Page 4 of 4

MATERIAL TECHNICAL RESOLUTION

APPROVAL

MULTI-PURPOSE

TO: File (Procurement Package)

FROM: Plant Engineering W. F. Shuck 10-14-83
(Cognizant Engineer)

P.O. # L16435 VENDOR Ingersoll Rand

Check Use ◯

In accordance with the findings and recommendations presented by Burns and Roe, Inc., all technical deficiencies in Procurement evaluations/packages listed on the Procurement Status Summary have been resolved.

Documentation associated with resolutions are hereby attached to the Procurement Status Summary and will be contained in the permenent Procurement Package.

D.N. # _____ General Information _____

Correspondence _____

Check Use ◯

In cases resulting in recommended Material Acceptance, but where comments exist regarding future status, requirements or specifications; the Technical Review personnel should review the Procurement Status Summary in the original package prior to or at the time of re-order.

Other ✓

Burns and Roe made recommendations only in this package, no deficiencies identified, no further action required

FOIA-84-206
M/58

Procurement Status Summary

P.O. No: 16-35

General Description of Material Ordered: Safety Evaluation for Auxiliary Steam Supply System

Nuclear Plant Related — Yes ✓ — No ____

Safety Related — Yes ____ — No ✓

QR Document Matrix — Yes ____ — No ✓

L. Williams for Hayes — Cognizant Engineer — 10/12/83 Date

[illegible] — QA Engineer — 10/12/83 Date

Specified Requirements:

Acceptable ____

Over-Specified ✓ (See Attachment)

Under-Specified ____ (See Deficiency List).

Document Review — Material not received as of 10/12/83

Acceptable ____

Unacceptable ____ (See Deficiency List)

Unavailable ____ (See Deficiency List).

Material Acceptable for Intended Application

Yes ____

No ____ (See Deficiency List)

L. Williams for Hayes — Cognizant Engineer — 10/12/83 Date

[illegible] — QA Engineer — 10/12/83 Date

I do not concur

Future P.O. should remain Safety Related/QA Required

See LP&L evaluation sheet attached

William J. Hayes 10/12/83

Attachment

P.O. No. L 16735

Part No. or Description (When appropriate)

The spare parts furnished under this Purchase Order are not within the jurisdiction of ASME Code, Section III, Article NC-2110.

Future Purchase Orders should be downgraded to Non-Safety Related / QA Required.

P.O. L16435

SUBJECT: Burns & Roe Procurement Status Summary - LP&L Review

Since these parts, procured by the subject purchase order, are used in a safety class component and have NCA 3800, Appendix B to 10CFR50, and ANSI N45.2.9 imposed on them, the purchase order should be Safety Related/QA Required.

Therefore, future purchase orders should remain Safety Related/QA Required.

William J. Hayes

William J. Hayes 10/12/83

Procurement Status Summary

I CONCUR. SEE attached evaluation. JBL 10/3/83

P.R. No. 10570

General Description of Material Ordered: Steam Generator (Reactor Coolant Pump Support Skirt) Shipyard Field

Nuclear Plant Related	Yes ✓	No
Safety Related	Yes	No ✓
DR Document Matrix	Yes	No ✓

Originator/Engineer — Date 2-13

QA Engineer — Date 2/14/83

Specified Requirements:

Acceptable		
Over-Specified	✓	(See Attachment)
Under-Specified		(See Deficiency List)

Document Review P.O HAS NOT BEEN ISSUED AS OF 2-14-83

Acceptable		
Unacceptable		(See Deficiency List)
Unavailable		(See Deficiency List)

Material Acceptable for Intended Application

Yes

No (See Deficiency List)

Cognizant Engineer — Date 2-14-83

QA Engineer — Date 2/14/83

FOIA-84-206
M/59

Attachment

P.R. No. 4057*

Part No. or Description (when appropriate)

The spare parts furnished under this Purchase Requisition are not within the jurisdiction of the ASME Code. Therefore B&R recommends that future Purchase Orders should be downgraded to Non-Safety Related/QA Required.

The Purchase Requisition as written does not include the major exception taken on I 23.52 in reference to the deletion of the limited shelf life requirement on page 2 of 4 of the Purchase Requisition.

Procurement Status Letter:

LC-272-D

* Concur - Clarsen 2/7/83 with the proviso that these are not the high range containment γ-radiation monitors required by NUREG-0737

Material Description of Material Ordered:
CALIBRATE VICTOREEN R-CHAMBER UNIT.

Nuclear Plant Related — Yes _____ No X
[illegible] Related — Yes _____ No X
Equipment Matrix — Yes _____ No X

GKD — Cognizant Engineer — 12/29/82 — Date

DRB — CM Engineer — 12/29/82 — Date

Technical Requirements:
Acceptable X
Over-Specified _____ (See Attachment)
Under-Specified _____ (See Deficiency List)

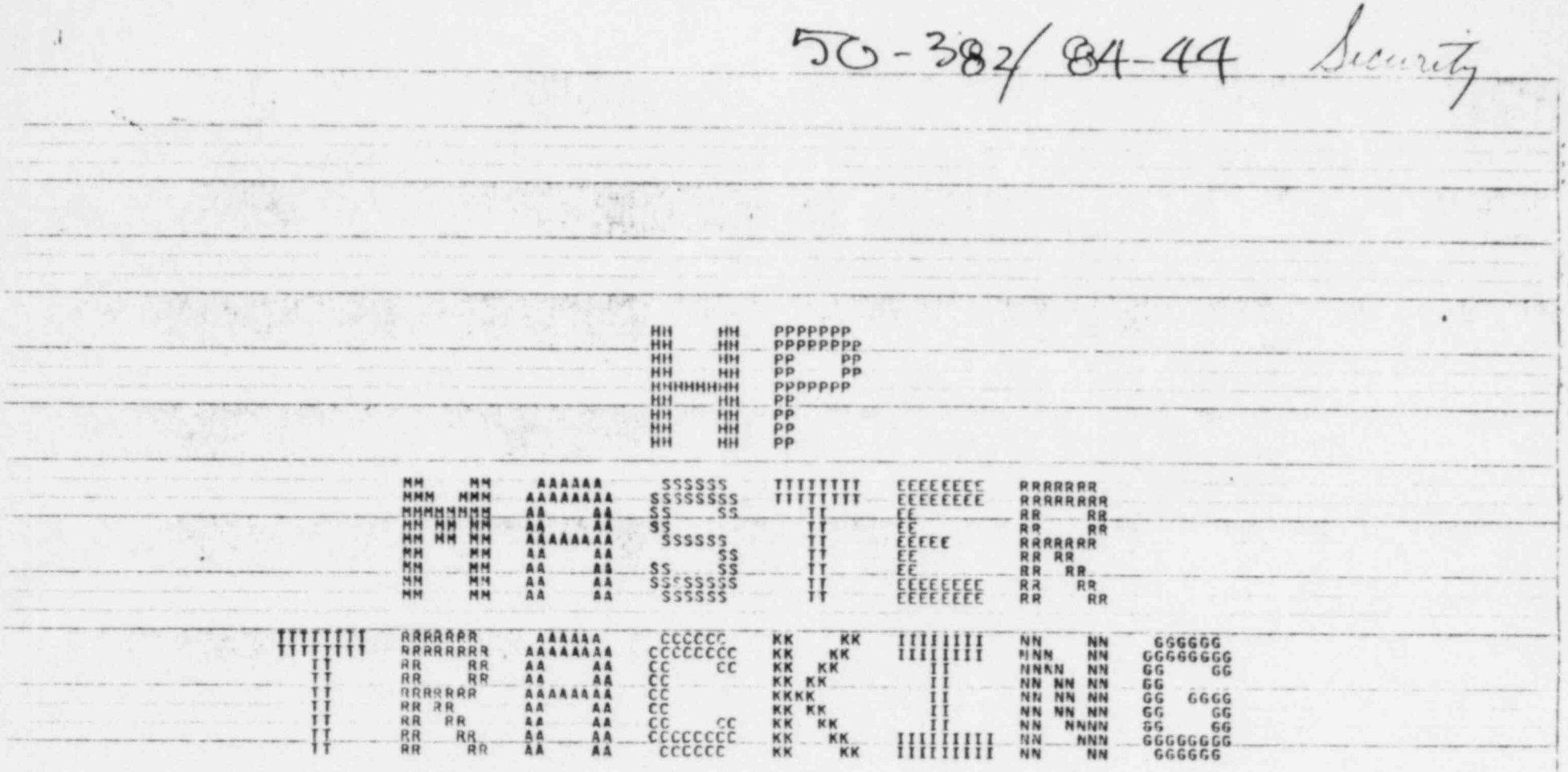
Technical Review
Acceptable X
Unacceptable _____ (See Deficiency List)
Unavailable _____ (See Deficiency List)

Recommended for Oriental Application
X
_____ See Deficiency List

[illegible] — [illegible] — [illegible]

FOIA-84-206
M/60

50-382/84-44 Security



FOIA-84-206

HEWLETT-PACKARD COMPUTING SYSTEM ALL OPEN ITEMS FOR SYSTEM SS (MIS)

PRIMARY SORT KEY: ITEM NUMBER

NO SECONDARY SORT KEY

85 ITEM NUMBERS SELECTED FOR THIS REPORT

PAGE EJECTION ON PRIMARY SORT KEY

THIS REPORT LIMITED TO THE FOLLOWING RANGES

FIELD NAME	START VALUE	END VALUE
CLOSURE DATE	(BLANK)	(BLANK)
TABLE C	SS	SS

ITEM.NUMBER...	PRI	DESCRIPTION.....	R1	INPUT...	SHIPPING	DUE.....	ECD.....	CLOSURE.
AUX.1.....	AREA.	DESCRIPTION.....	R2	CONTRACTOR..	CODE.NO.	FUTURE.A/N.TRACE		
AUX.2.....	SUS..	DESCRIPTION.....	R3	PURCH.ORDER.	COMMENT.....			
AUX.3.....	TBL.C	DESCRIPTION.....	R4	MRR.....	COMMENT.....			
MAN.HOURS...	TBL.D	DESCRIPTION.....	R5	XREF.DOC.1..	COMMENT.....			
REMAIN.HOURS	TBL.E	DESCRIPTION.....	R6	XREF.DOC.2..	COMMENT.....			
TAG.ID.....		DESCRIPTION.....	R7	LIST.6.....	COMMENT.....			

LCIWA-005796 7.1 SPARE ISC COLOR MONITOR KEYBOARD DOES NOT OPERATE PROPERLY. 90 07/03/84 PMI OPEN
00000007 840924-591-XFR
20 WORK COMPLETE/IN CLOSURE 8/14/84
SS
00000000 PMI
00000000 1210 W/PETRI 07/03/84
MONITOR
R 35010320

LCIWA-007797 7.1 ZONE #434 DOOR #96 #46 BAR WILL NOT RESET. 90 05/28/84 PMI OPEN
00000007 840924-591-XFR
20 WORK TO BE DONE 008230
SS
00000000 PMI HOLD FOR PROCEDURE
00000000 1003 SYSTEM HOLD FILE 6/22/84
R 48062216

LCIWA-007892 7.3 METAL DETECTORS IN THE ADMINISTRATION PRIMARY ACCESS POINT ARE TOO SENSITIVE. THIS CIWA IS WRITTEN TO REPLACE SAP-841823. 90 05/29/84 PMI 06/03/84 OPEN
00000007 840924-591-XFR
05 20 WORK COMPLETE/IN CLOSURE
SS
00000000 PMI W/SARRAN 5/29/84
00000000 1210
METAL DETS.
R 35052908

LCIWA-008101 7.1 MANY OF THE CARD READERS IN THE PLANT WILL EITHER NOT READ OR REQUIRE MORE THAN ONE PASS OF THE CARD HOWEVER, WHEN THE READER IS TESTED IN THE SHOP IT WORKS WELL. RECOMMEND THAT WE RETURN 2 OF THESE READERS AND SOME CARDS TO THE VENDOR FOR EVAL. 90 06/04/84 PMI-C 32939821 OPEN
00000007 840924-591-XFR
20 PE TO CLOSE
SS
00000000 PMI SPARE PARTS 6/18/84
00000000 1000 PO L-48053
CARD READERS
R 26091912

LCIWA-008146	7.1	COMPLETE DOOR LATCH/LOCKING SYSTEM IS MISSING	9E	06/01/84			OPEN
		FROM DOOR.		PMM	00000007	840924-591-XFR	
	20	ZONE 271			WORK COMPLETE/IN CLOSURE		
	SS						
00000000	PMM				SYSTEM HOLD FILE 07/06/84		
00000000	1003						
			R	35061318			
LCIWA-008246	7.1	WHILE ATTEMPTING TO INVESTIGATE LIGHTING IN ROOM,	9E	06/04/84			OPEN
		THE HANDLE ON DOOR 271 PULLED OFF MAKING ROOM IN-		PMM	00000007	840924-591-XFR	
	20	ACCESSIBLE. RECOMMEND REMOVING HANDLE ROOM FROM			WORK COMPLETE/IN CLOSURE		
	SS	DOOR AND WELD HANDLE ON TO PLATE. LOCATED ON ROOF					
00000000	PMM	RAB WEST SIDE.			HOLD FILE 06/12/84		
00000000	1003						
			R	35060419			
LCIWA-008437	7.4	THE WIRING FOR THE CARD READER ON DOOR 34A WAS	9D	06/08/84	08/01/84		OPEN
		MODIFIED TO BY-PASS AN AUX RELAY & USE THE STRIKE		PMI	00000007	840924-591-XFR	
01	20	TIMER RELAY INSTEAD. THIS WAS DONE INORDER TO MAKE					
	SS	THE DOOR OPERATIONAL SINCE THERE WERE NO AUX RELAY					
00000000	PMI	AVAILABLE AND P/S WAS MONTHS AWAY. THE AS BUILT			FOR SMP-84-203		
00000000	1003	WERE SUBMITTED TO ESSE WHO ISSUED DCN-E-1144.			SYSTEM HOLD FILE 6/8/84		
CARD READER		SMP-84-203, ACCEPTING THE MOD.	R	26100407			
LCIWA-008735	7.3	INSTL & PAINT THE FOLLOWING: 1)A SYSTEM OF PIPES &	9E	06/18/84			OPEN
		CBLS (3"HIGH) ON THE EXTERIOR SIDE OF THE PA FENCE		PMM	00000007	840924-591-XFR	
	20	(N WEST CORNER)WEST SIDE OF THE FENCE BETWEEN THE					
	SS	NORTH PA FENCE & SERVICE BLDG & AROUND THE MICRO-					
00000000	PMM	WAVE HEAD AT THE SERVICE BLDG S WEST CORNER.STRIPE			WPP 06/18/84		
00000000	1100	GROUND & PAINT "NO PARKING" AROUND SERVICE BLDG,					
		PLACE CEMENT PARKING BARRIERS.....SEE DOC	R	48061814			

LCIWA-008804 7.4 DOOR 265 (ZONE 500) LOCATED ON S/W CORNER OF 446 9E 06/19/84 OPEN
RAB HAS MISSING DOOR KNOB ON OUTSIDE OF DOOR. PMM 00000007 840924-591-XFR
20
SS
00000000 PMM SYSTEM HOLD FILE 07/06/84
00000000 1003
R 48061919

LCIWA-008835 7.2 GATE LOCATED BY ACCESS POST #1 (WEST SIDE OF ADMIN 9C 06/26/84 OPEN
BLDG) DOES NOT OPERATE. PME 00000007 840924-591-XFR
20 TO BE INVALIDATED
SS
00000000 PME WPP RECD 6/26/84
00000000 1100
R 48062613

LCIWA-008838 7.4 DOOR #177, -35 RAB STAYS IN ALARM ZONE #500. DOOR 9D 06/28/84 OPEN
SM-0203 HAS BEEN PERMANENTLY CLOSED. (WELDED). PMI 00000009 840924-591-XFR
20
SS
00000000 PMI SMR-84-400
00000000 1003 SYSTEM HOLD FILE 7/3/84
R 26100407

LCIWA-008885 7.2 SAFETY CONCERN MISSING HANDLES HAVE ALREADY CAUSE 9E 09/05/84 OPEN
INJURIES REPLACE HANDLES ON DOORS #153, #170. NOTE PMM 00000007 840926-611-MTS
THIS DOOR IS THE EXIT DOOR FOR HP CONTROL POINT
SS SOUTH OF DOOR #155, -4RAB.
00000000 PMM WPP 9/27/84
00000000 1210
R 24092715

LCIWA-009389 7.4 SECURITY CARD READERS DO NOT ALWAYS READ A CARDKEY DURING THE FIRST PASS-THROUGH. 90 07/03/84 PMI-C OPEN
00000007 840924-591-XFR
20
SS
00000000 PMI
00000000 1210
W/PETRI 7/03/84
CARD READER
R 48070319

LCIWA-009485 7.4 SUPERVISED LINE BOARDS WHICH HAVE FAILED NEED TO BE REWORKED AND RESTORED TO PROPER OPERATION. 90 07/25/84 PMI-C OPEN
00000007 840924-591-XFR
03 20
FIELD WORK COMPLETE
SS
00000000 PMI
00000000 1210
W/ARANT 08/01/84
SUPERVISED
R 44080110

LCIWA-009496 7.4 REWORK PAN/TILT PELCO UNIT, MODEL PT1250DC S/N 10423-2. (SPARE) 90 08/08/84 PMI-S 08/30/84 OPEN
00000007 840924-591-XFR
03 20
FIELD WORK COMPLETE
SS
00000000 PMI
00000000 1100
W/GUIDRY 8/8/84
PELCO UNIT
R 44080809

LCIWA-009497 7.4 REWORK SPARE CCTV SYSTEM CAMERAS MODEL TC1005 AND TC1030. 90 08/08/84 PMI 08/30/84 OPEN
00000007 840924-591-XFR
03 20
FIELD WORK COMPLETE
SS
00000000 PMI
00000000 1100
W/GUIDRY 8/8/84
CAMERAS
R 44080809

LCIWA

LCIWA-010096 7.2 SAS RADIO BASE STATION WILL NOT OPERATE. NO INTERCOM, RADIO OR CLOSCK WILL NOT TRANSMIT OR RECIEVE. 9C 07/27/84 PME 00000007 840924-591-XFR OPEN

20
SS
00000000 PME
00000000 1107

WPP 07/30/84

R 29073011

LCIWA-010498 7.3 DOOR 217 WILL NOT LOCK AS PER TECH SPEC SURVEILLANCE OP-903-001. 9E 08/27/84 PMM 00000007 840924-591-XFR OPEN

20
SS
00000000 PMM
00000000 1000

SYSTEM HOLD FILE 09/24/84

R 27092413

LCIWA-010655 7.3 TV3 ZONE 169 EAST SIDE OF SITE DOES NOT HAVE VIDEO 9D 09/25/84 PMI 00000007 840925-611.MTS OPEN

Intermittent problem

SS
00000000 PMI
00000000 1210

W/PETRI 9-25-84

R 23092513

LCIWA-010661 7.3 (TV 13, WEST OF SERVICE BLDG). WIPERS ON CAMERA 13 DO NOT WORK. 9D 09/25/84 PMI 00000007 840925-611-MTS OPEN

Wipers motor

SS
00000000 PMI
00000000 1210

W/PETRI 9-25-84

R 25092513

LCIWA-010787 7.2 DOOR KNOB AND LOCK GONE. CANNOT OPERN DOOR. DOOR LOCATED IN S-6 FAN ROOM TO OUTLET PLENUM. 9E 09/28/84 PMI 00000007 840928-563-MTS OPEN

SS
00000000 PMM
00000000 1100
WPP 10/01/84

R 27100109

LCIWA-011068 7.3 CAMERA 22, ZONE 250, HAS EXTREME IMAGE BURN IN - VERTICAL LINES. CAMERA 22 SOUTH OF CHILLER BLD 9D 10/11/84 PMI 00000007 841011-823-MTS OPEN

See note

SS
00000000 PMI
00000000 1210
W/PETRI 10/11/84

R 34101111

LCIWA-011069 7.3 SECURITY LIGHTING PANEL #3 UNDERVOLTAGE +18 SERVICE BLDG. CONTAMT TAMPER 9D 10/11/84 PMI 00000007 841011-159-MTS OPEN

SS
00000000 PMI
00000000 1004
SYSTEM HOLD 10/19/84
NEED SM-84-475

R 27101913

LCIWA-011136 7.3 GATE #3 NORTH ENTRANCE TO THE VEHICLE TRAP, TOP & BOTTOM SUPPORT POLES & WEST END SUPPORT POLE BENT ON GATE. 1A 10/16/84 PMM 00000007 841016-491-MTS OPEN

SS
00859821
00000000 ECI
00000000 1100
TO CIVIL CONST 10/22/84

R 30102514

LCIWA

LCIWA-011146 7.1 STATION MOD 84-291 NEEDS TO BE IMPLEMENTED. 9D 10/15/84 OPEN
SM-0291 PMI 00000006 841015-159-MTS
TO CLOSURE 10/17
SS
00000000 PMI
00000000 1210 W/PETRI 10/15/84
R 24101608

LCIWA-011147 7.2 DOOR KNOB MISSING FROM DOOR. LOCATION 446 RAB EAST. 9E 10/16/84 OPEN
PMM 00000007 841016-491-MTS
SS
00000000 PMM
00000000 1100 WPP RECEIVED 10/16/84
R 22101614

LCIWA-011148 7.2 CAMERA #8 ALARMED ON 10/9/84 AS FOLLOWS 0053-0102 HRS ALARM/RESET 105 TIMES, 0212 HRS ALARM/RESET 105 TIMES, 0629 HRS ALARM/RESET 16 TIMES. NO APPARENT CAUSE CAN BE DETERMINED. 9D 10/16/84 OPEN
PMI 00000007 841018-563-MTS
SS
00000000 PMI
00000000 1210 W/PETRI 10/18/84
R 22101614

LCIWA-011222 7.3 THE HANDLE IS MISSING FROM DOOR 51, ZONE 323. THIS IS THE INSIDE HANDLE DOOR 51 IS LOCATED ON THE +21 LEVEL OF THE RAB EAST SIDE. DOOR 51 ENTERS THE COOLING TOWER AREA. 9E 10/18/84 OPEN
PMM 00000007 841018-823-MTS
SS
00000000 PMM
00000000 1100 WPP 10/18/84
R 25101811

LCIWA

LCIWA-011225 7.3 THE DOOR KNOB IS LOOSE ON DOOR 249. DOOR 249 IS LOCATED ON THE -5 LEVEL OF THE RAB. ZONE 364. 9E 10/18/84 PMM OPEN
00000007 841018-823-MTS

SS
00000000 PMM
00000000 1100
WPP 10/18/84

R 25101811

LCIWA-011226 7.3 THE MANUAL LOCKING MECHANISM ON DOOR 35 IS NOT FUNCTIONING PROPERLY. WHEN THE MECHANISM IS OPERATED FROM THE EHB SIDE, THE UNIT FALLS OFF THE DOOR. THE OPERATING HANDLE ON THE RAB SIDE OF THE DOOR IS MISSING. DOOR 35 IS LOCATED ON THE +21 LEVEL OF THE RAB. WEST SIDE, RADIATION AREA. 9E 10/18/84 PMM OPEN
00000007 841018-823-MTS

SS
00000000 PMM
00000000 1100
WPP 10/18/84

R 25101811

LCIWA-011249 7.3 PERIMETER CAMERA #11, THE VIDEO PICTURE IS WHITED OUT. needs IO's adjustment can 9D 10/18/84 PMI OPEN
00000007 841019-159-MTS

SS
00000000 PMI
00000000 1210
W/PETRI 10/19/84

R 25101811

LCIWA-011278 7.3 DISTORTED VIDEO IN DAYLIGHT. WIPER NOT OPERATNG. PERIMETER CAMERA #3, EAST SIDE OF SITE NEAR FENCE. This is a duplicate 9D 10/19/84 PMI OPEN
00000007 841023-563-MTS

SS
00000000 PMI
00000000 1210
W/PETR. 10/23/84

R 24102315

LCIWA

LCIWA-011279 7.3 WIPER NOT OPERATING. PERIMETER CAMERA #10, WEST SIDE OF SITE NEAR FENCE. ZONE 243. 9D 10/23/84 PMI 00000007 841023-563-MIS OPEN

SS
00000000 PMI W/PETRI 10/23/84
00000000 1210

R 24102315

LCIWA-011280 7.3 NO VIDEO, ZONE 173. PERIMETER CAMERA #2, EAST SIDE OF SITE NEAR FENCE. 9D 10/19/84 PMI 00000007 841020-159-MIS OPEN

SS
00000000 PMI W/PETRI 10/20/84
00000000 1210

R 27101916

LCIWA-011282 7.2 GATE #3 LOCATED NORTH OF VEHICLE TRAP DOES NOT OPERATE AT ANY OF THE CONTROL PANELS. 9C 10/19/84 PME 00000007 841019-563-MIS OPEN

SS
00000000 PME WPP 10/19/84
00000000 1100

R 27101916

LCIWA-011283 7.3 WIPER NOT OPERATING. ZONE 165. PERIMETER CAMERA #25, NORTH CENTRAL ADMIN PARKING LOT NEAR GATE 4 9D 10/19/84 PMI 00000007 841020-159-MIS OPEN

SS
00000000 PMI W/PETRI 10/20/84
00000000 1210

R 27101916

LCIWA-011284 7.3 VIDEO BLANKS OUT WHEN WIPER IS ACTIVATED. PERIMETER CAMERA #7. SOUTH SIDE OF TGB. ZONE 406 — 9D — 10/19/84 PMI — 00000007 841020-159-MTS — OPEN

SS PMI 00000003 1210 — W/PETRI 10/20/84

R 27101916

LCIWA-011285 7.3 WIPER NOT OPERATING. PERIMETER CAMERA #20, SOUTH SIDE OUTSIDE OF FENCE. ZONE 408 — 9D — 10/19/84 PMI — 00000007 841020-159-MTS — OPEN

SS PMI 00000000 1210 — W/PETRI 10/20/84

R 27101916

LCIWA-011348 7.3 DOOR 97 LOCATED +46 LEVELOF THE RAB NEEDS THE HANDLE REPAIRES. THE INSIDE HANDLE IS NOT MOUNTED TO THE INNER SHAFT AND FALLS OFF THE MECHANISM WHEN THE DOOR IS CLOSED. — 9E — 10/24/84 PMM — 00000007 841025-159-MTS — OPEN

SS PMM 00000000 1100 — WPP 10/26/84

R 27102609

LCIWA-011349 7.3 ABOVE SYSTEM GOES INTO A "FREE WHEELING" MODE WHEN PLACED IN THE "IN" POSITION FROM FASCO, WITHOUT THE BUTTON BEING DEPRESSED. — 9C — 10/24/84 PME — 00000007 841024-611-MTS — OPEN

SS PME 00000000 1100 — WPP 10-24-84

R 23102414

LCIWA-011350	7.2	POST 10 (ACP) LOC: NEAR VEHICLE GATE #35 AND FIRST AID BUILDING	THE POST 10 (ACP POST) PERSONNEL GATE ENTRANCE RETURN MECHANISM LEADING TO THE IRL AREA, FIRST AID AND OTHER CO NEEDS TO BE ADJUSTED. THE LOCK IS NOT SECURE.	9E	10/24/84 PMM	00000007 841025-159-MTS	OPEN
	SS					WPP 10/26/84	
00000000	PMM						
00000000	1100						
				R	27102609		
LCIWA-011351	7.3	CAMERA 18, PTZ LOCATED SE OF VEHICLE TRAP ON THE OUTSIDE OF THE PROTECTED AREA, WILL NOT PAN FROM THE EACSO JOYSTICK. ZONE 166.		9D	10/24/84 PFI	00000007 841024-159-MTS	OPEN
	SS						
00000000	PMI					W/PETRI 10/24/84	
00000000	1210						
				R	25102412		
LCIWA-011357	7.2	INSTALL REVISION "E" SOFTWARE FROM SYSNETRON IN ONE OF THE SECURITY COMPUTERS. CHANGE BACKGROUND LEVEL COMMANDS TO LEVEL #2. CHANGE CLEAR SCREEN COMMAND TO INCLUDE LOOP ERRORS. THIS CIWA IS FOR ENGINEERING EVALUATION OF POSSIBLE CHANNEL.		9G	10/24/84	00000007 841024-159-MTS	OPEN
	SS						
00000000	NE					TO NE 10/24/84	
00000000	1100						
				R	25102412		
LCIWA-011417	7.1	VEHICLE TRAP, SOUTH GATE, CHECK NORTH GATE ALSO BROKEN SHEAR PIN.		9E	10/25/84 PME	00000007 841025-563-MTS	OPEN
	SS						
00000000	PMM					WPP 10/25/84	
00000000	1100						
				R	27102514		

LCIWA-011436 7.2 097. GTS 1 ACTE'S CARD READER'S NEED THE ENCLOS- 9D 10/26/84 OPEN
URES CHANGED TO THE NEW TYPE. PMI-C 00000007 841026-491-MIS

SS
00000000 PMI W/PETRI 10/27/84
00000000 1210
CARD READERS R 27102707

LCIWA-011501 7.1 DOOR #161, ZONE #20, ALARMS DUE TO AIR PRESSURE. 9D 10/29/84 OPEN
0001-0900-73 ALARMS PMI 00000007 841029-491-MIS
0700-0930-35 ALARMS
SS SECURITY OFFICER POSTED.
00000000 PMI W/GUIDRY 10/29/84
00000000 1100
R 22102916

LCIWA-011619 7.1 IMPLEMENT STATION MOD 84-456. AA 10/29/84 OPEN
EC 00000003 841029-172-MIS

SS
00000000 ECI WPP 10/29/84
00000000 1100
R 24102916

LCIWA-011624 7.1 SECURITY FLOOR TO CEILING TURNSTILE 1, 2, 3 ARE 9C 10/29/84 OPEN
OUT OF COMMISSION. (NOS EMER WORK). PME 00000007 841029-563-MIS

SS
00000000 PME WPP 10/29/84
00000000 1100
R 27102916

LCIWA-018049 7.3 THE INSIDE DOOR HANDLE AT D 185, +46 LEVEL IS 9E 08/06/84 OPEN
DAMAGED. PMM 00000007 840924-591-XFR
20
SS
00000001 PMM WPP 8/17/84
00000000 1100
R 46080615

LCIWA-018051 7.3 THE C.A.S. ANNUNCIATOR PANEL ONLY RECEIVED AN 9D 08/06/84 OPEN
ALARM ON RADIO # 0193. NOTE: RADIO #0193 WAS PMI 00000007 840924-591-XFR
20 TURNED OFF AND IN THE SECURITY OFFICE DRAWER.
SS
00000000 PMI W/PETRI 8/7/84
00000000 1210
R 44080711

LCIWA-018140 7.4 THE PROTECTIVE HOUSINGS ON THE OUTSIDE SECURITY 9D 08/09/84 10/21/84 OPEN
CAMERAS HAVE LARGE OPENINGS IN THEM FOR CABLE PMI 00000007 841008-563-MIS
20 ENTRANCE. BIRDS ARE ENTERING THESE OPENINGS AND
SS NESTING INSIDE THE HOUSING. PLUG HOUSING OPENINGS
00000000 PMI WITH DUC. SEAL. THIS SHOULD ALSO BE DONE WITH ANY W/PETRI 10/08/84
00000000 1210 OPENINGS ON JUNCTION BOXES.
R 26100815

LCIWA-018175 7.3 FOUND WHAT APPEARS TO BE FUEL OIL ON TOP OF BATT- 9C 08/13/84 OPEN
ERY FROM AN UNDETERMINED SOURCE. THERE IS NO SIGN PMM 00000007 840924-591-XFR
20 OF FUEL OIL ANYWHERE ABOVE BATTERY NOR IS THERE
SS ANY SIGN OF OIL ON ANY OF THE EQUIPMENT ANYWHERE
00000010 PME NEAR THE BATTERY. THIS IS A RECURRING PROBLEM. WPP 09/04/84
00000000 1100
EBATI R 22092509

LCIWA

LCIWA-018221 7.2 THE SECURITY SYS COMPUTER STUCK IN THE "BUSY" 9D 08/13/84 OPEN
MODE AND NO COMMANDS COULD BE ENTERED AT THIS TIME PMI 00000007 840924-591-XFR
20 (A "PZ", COMMAND HAD BEEN ENTERED AND THEN ABORTED
SS A COMMAND THEN CAME UP FROM THE ACF CONSOLE, THEN
00000000 PMI "BUSY" CAME ON). (THE COMPUTER WAS RESET BY FRANK W/PETRI 08/16/84
00000000 1210 LEE BY TRANSFERRING TO THE BACKUP COMPUTER)
R 46081319

LCIWA-018279 7.4 INSTALE GROUND STRAP CONNECTION FOR X-RAY SCANNER 9C 08/14/84 OPEN
ADMIN BLDG. FOR EARTH GROUND. NEED FLOOR CONNEC- PME 00000007 840924-591-XFR
20 TION. SEE CHRIS GUILLOT OR JON HOUAN I/C MET. LAB.
SS
00000000 PME WPP 8/14/84
00000000 1100
X-RAY SCANNER R

LCIWA-018471 7.1 THE FOLLOWING ZONES FAILED REMOTE TESTING VDA KEY 9G 08/23/84 OPEN
BOARD COMMAND: 411,183,416,249,404,412,167,266. PMI 00400007 841015-563-MTS
20 THE ABOVE ZONES WHEN REMOTELY TESTED DISPLAY A
SS TEST-NO-TEST MESSAGE ON THE CRT. AN OTHER ZONES
00000000 NE DISPLAY TEST-OK-TEST MESSAGES. NO CAUSE CAN BE W/PE 10/04/84
00000000 1100 FOUND FOR THE NO TEST MESSAGE.
R 26102613 NE (W. LOWRANCE)

LCIWA-018527 7.3 THE WORK PER NCR 2563 WAS IDENTIFIED AS BEING DONE 9C 08/27/84 OPEN
ON CIWA-810809, & HA AN LP&L SIGN OFF IN BLOCKS PME 00000007 840924-591-XFR
20 30 &31. CIWA WAS CLOSED 11/17/81. THIS PROBLEM
SS WAS IDENTIFIED DURING LP&L QA VERIFICATION OF NCR
00000000 PME W3-2563. SINCE THIS WAS DURING A PERIOD OF TIME WPP 8/27/84
00000000 1100 WHEN CONSTRUCTION WAS STILL WORKING ON MOTOR CON-
MCC38311 TROL CENTERS, IT IS APPARANT WORK DONE. R 23082715

LCIWA-018543	7.2	COMPUTER SYSTEM IS PRINTING INCORRECT DATE ON	9G	08/27/84				OPEN
		BACKGROUND PRINTER. NOTE: DATE ON CRT IS CORRECT &		PMI		00000007	840924-591-XFR	
	20	ALSO DATE ON FOREGROUND PRINTER IS CORRECT.						
	SS							
00000000	NE							
00000000	1100							
						W/DENNIS KRAMER 8/30/84		
				T 29083009				
LCIWA-018554	7.1	E-FIELD PERIMETER INTRUSION DETECTION ZONES DO NOT	9F	08/28/84		10/08/84	10/29/84	OPEN
		MEET NRC GUIDELINES STIPULATED IN REGULATORY GUIDE		PE		00000007	841018-563-MTS	
	20	5.44 "PERIMETER INTRUSION ALARM SYSTEMS", MAY 1980				ESD 10/8 ECD 10/19		
	SS	SECTION C PART 4 UNDER "ALARM CONDITIONS".						
00000000	PE					TO PE FOR EVAL		
00000000	1100							
						RESTRAINED BY LCIWA-018892,018874		
E-FIELD ZONES				R 26100411		PE EVAL (V MCADAMS)		
LCIWA-018555	7.1	MICROWAVE PERIMETER INTRUSION DETECTION ONES DO	9F	08/28/84		10/08/84	10/29/84	OPEN
		OT MEET NRC GUIDELINES STIPULATED IN REG. GUIDE		PMI		00000007	841018-563-MTS	
	20	.44, PERIMETER INTRUSION ALARM SYS., MAY 1980,				ESD: 9/8 ECD 10/19		
	SS	EC. C PART 4 - UNDER "ALARM CONDITIONS".						
00000000	PE							
00000000	1100							
MICROVE				R 26100411		PE EVAL(V MCADAMS) ECD:10/19/84		
LCIWA-018569	7.4	SECURITY COMPUTERS A&B FAILED ON 8/23/84 AT 2359	9G	08/29/84				OPEN
		HRS. IN ORDER TO REINSTATE SYSTEM HISTORY FOR 08/				00000007	840924-591-XFR	
	20	23/84 WAS DELETED. SYSTEM WAS OFFLINE FOR APPROX 3						
	SS	HOURS. ALSO ANY HISTORY REPORTS RECEIVED FROM THE		00939619				
00000000	NE	BACKGROUND LINE PRINTER HAVE A HEADER PRINTED WITH				TO NE 8/29/84		
00000000	1100	THE LAST DATE OF INITIALIZATION OF THE CURRENT						
		DATE. SECURITY COMPUTERS ARE LOCATED ON +7 PAB.		R 30091014				

LCIWA-018581 7.2 SECURITY SYSTEM MONITORED DOOR AND CARD READER 9D 08/29/84 10/31/84 OPEN
CONTROLLED EQUIPMENT DO NOT FUNCTION PROPERLY. PMI 00000007 840924-591-XFR
20
SS
00000000 PMI LCIWA-008566 W/PETRI 8/29/84
00000000 1210
R 27082918

LCIWA-018582 7.2 PERIMETER MICROWAVE ZONE DOES NOT FUNCTIONS PRO- 9D 08/29/84 09/28/84 OPEN
PERLY. PMI 00000007 840924-591-XFR
20
SS
00000000 PMI W/PETRI 8/29/84
00000000 1210
MICROWAVE
R 27082918

LCIWA-018583 7.2 PERIMETER E-FIELD ZONE DOES NOT FUNCTIONS PROPERLY 9D 08/29/84 09/28/84 OPEN
PMI 00000007 840924-591-XFR
20
SS
00000000 PMI W/PETRI 8/29/84
00000000 1210
E-FIELD
R 27082918

LCIWA-018585 7.1 VEHICLE TRAP GATE #2 EAST SIDE ADMIN BLDGS PULLEY 9E 08/30/84 OPEN
BELTS BURNED OUT ON MOTOR GATE HAS TO BE MANUALLY PMM 00000007 840924-591-XFR
20 CLOSED. REQUIRES 4 SECURITY OFFICERS TO CLOSE.
SS
00000000 PMM TO WPP 09/04/84
00000000 1100
R 24090418

LCIWA

LCIWA-018587 7.3 ON AUG. 11/1984 AT 05:30:30 HRS THE MAIN SECURITY 9G 08/30/84 OPEN
COMPUTER FAILED. AT 05:30:30 HRS THE FOLLOWING 00000007 840924-591-XFR
20 COMMAND WAS ENTERED. LK,DI,2613,1. OBVIOUSLY THE
SS ITEMN CATEGORY HAS BEEN EXCEEDED; HOWEVER, A
00000000 NE "FORMAT ERROR" MESSAGE SHOULD HAVE BEEN DISPLAYED TO NE ON 8/30/84
00000000 1100 INSTEAD OF THE COMPUTER FAILURE.
I 22083013

LCIWA-018590 7.3 WHEN REVISION "D" OF SOFTWARE FOR SECURITY SYSTEM 9G 08/30/84 OPEN
WAS INSTALLED IT WAS NOTED THAT THE TIME DISPLAYED 00000007 840924-591-XFR
20 WOULD INTERMITTENTLY NOT BE UPDATED EVERY FOUR
SS SECONDS IN REV C. ON OCCASION THE TIME WILL STICK
00000000 NE FOR 30 SECONDS. CURRENTLY THE TIME IS INTERMITTENT TO NE 8/30/84
00000000 1100 LY STICKING FOR 60-90 SECONDS.
R 23083015

LCIWA-018679 7.4 WTR TREATMENT ROLL UP DOOR HAS UNFINISHED WIRING 9C 09/07/84 OPEN
TO DOOR OPERATOR. PME 00000007 840924-591-XFR

SS
00000000 PME WPP 09/07/84
00000000 1100

R 25090717

LCIWA-018751 7.3 THE DOOR RETURN SPRING ON DOOR 43 IS NOT FUNCTION- 9E 09/11/84 OPEN
ING PROPERLY. THE DOOR DOES NOT FULLY CLOSE. PME 00000007 840911-563-MIS
LOCATION: DOOR 43, ZONE 5, +21 RAB.

SS
00000000 PMM WPP 10/16/84
00000000 1100

R 24101615 PE EVAL (A CILLUFFA)

LCIWA

LCIWA-018753 7.3 DOOR 68 (ZONE 54, RAIL ENTRANCE TO FHB) ALARMS WHEN FANS ARE TURNED ON . DUE TO AIR PRESSURE IN FHB THIS ZONE WILL NOT RESET TILL FAN ARE TURNED OFF. 9D 09/11/84 PMI 42859821 OPEN
00000007 840911-611-MTS
SS
00000000 PMI
00000000 1210
W/PETRI 9-11-84
R 30102514

LCIWA-018853 7.3 PERFORM MODIFICATIONS TO CAS ROOM AS FOLLOWS: (1) INSTALL CARPETING (2) INSTALL ACOUSTICAL PANELING ON WALL (3) INSTALL A SHELF IN THE EXTREME NIGHT BAY OF THE CAS CONSOLE. (PCR-085-1 APPLIES) 4F 09/11/84 37939085 OPEN
00000007 840911-159-MTS
SS
00000000 ECI
00000000 1100
TO CIVIL ENG 9/19/84
CAS R
R 30092015

LCIWA-018856 7.3 STATUS LEVEL #20 DOESN'T CONTAIN ZONE 334 (DR121), HOWEVER ANY CARD ASSIGNED STATUS LEVEL #20 IS ALLOWED ACCESS TO ZONE 334 UPON ENTRY. BUT WON'T ALLOW THE CARDUSER TO EXIT ZONE 334. THE STATUS LEVEL WAS CHECKED FOR CORRECTNESS & A SEPARATE CARD THAN THE ONE ORIGINALLY CAUSING THE PROBLEM WAS TRIED, THE MALFUNCTION CANNOT BE PINNED DOWN. 9G 09/11/84 PMI OPEN
00000007 841009-611-MTS
SS
00000000 NE
00000000 1100
RE&P ATTN: DENNIS KRAEMER 10-9-84
R 25091119

LCIWA-018857 7.3 LINE #3 OF SS CRT IS RESERVED FOR OPERATOR ERROR ADVISORY MESSAGES. IN CAS & SAS IN ORDER TO CLEAR THIS LINE, CLEAR SCREEN COMMAND MUST BE INPUT WITH CONSOLE KEYSWITCH ON.AT ACF THIS LINE CAN BE CLEARED W/O ANY RESTRICTIONS, BEFORE REV D THIS WASN'T POSSIBLE. BECAUSE ACF CONSOLE IS NOT MANNED 24 HRS CONSOLE SHOULDN'T CLEAR ERROR MESSAGES. 9B 09/11/84 OPEN
00000007 841026-611-MTS
SS
00000000 OPS
00000000 1110
OPS FOR INVALIDATION 10-26-84
R 25091119

LCIWA-018858 7.3 THE SECURITY SYSTEM IS EQUIPPED WITH A DC POWERED PHONE SYSTEM DESIGNATED FOR USE PRIMARILY FOR MAINTENANCE AND TEST PERSONNEL. THE SYSTEM HAS JACKS AT CARDREADERS,CONSOLES, PERIMETER ZONE TRANSMITTERS & RECEIVERS. WHEN USING THE SYSTEM WHEN IT WORKS THE CONVERSATION CAN BARELY BE HEARD, MUST TIMES NO CONVERSATION CAN BE HEARD. 9C 09/11/84 PME 00000007 840911-159-MTS OPEN
SS 00000000 PME 00000000 1100 R 25091119 WPP 09/11/84

LCIWA-018859 7.3 REMOTE MULTIPLEXER FHS1801 IS DISPLAYED AS DEAD INTERMITTENTLY ON THE CAS CRT AS FOLLOWS "LOOP ERROR 14 RMV 5 DEAD". THIS HAS OCCURRED ON THE FOLLOWING DATES/TIMES: 8-31-84/0530, 09-01-84/0153,09-02-84/1712, 09-03-84/1500HRS, 09-04-84/2201 HRS, 09-09-84/0525HRS, 09-09-84/1109HRS, 09-10-84/0345HRS.THIS REQUIRES COMPENSATORY MEASURES BE IMPLEMENTED. 9D 09/11/84 PMI 00000007 840912-611-MTS OPEN
SS 00000000 PMI 00000000 1210 00859821 R 27092016 W/PETRI 09/20/84

LCIWA-018898 7.3 DOORS 23,43,77&78 HAVE A HISTORY OF STRIKER MALFUNCTIONS. WHEN THESE MALFUNCTIONS OCCURE AN ALARM IS USUALLY GENERATED. IT'S THE OPINION OF THIS OFFICE THAT THIS PROBLEM IS CREATED BY EXCESSIVE AIR PRESSURE! THEREFORE, REQUIRING A PE EVAL. WHEN THESE MALFUNCTIONS CREATE A CONDITION OF CONSTANT ALARM, SECURITY DEPT IS COMMITTED TO POST AREAS. 9D 09/13/84 PE 00000007 841019-159-MTS OPEN
SS 00000000 PMI 00000000 1210 R 27101812 W/PETRI 10/19/84

LCIWA-018900 7.4 GATE 27 IS A MOTORIZED GATE ENTERING TRAILER CITY FROM THE PARKING LOT. GATE 27 IS NOT PROPERLY ALIGNED WHEN IT IS CLOSED. THIS GATE IS SUPPOSED TO HAVE THE CAPABILITY TO PADLOCK! HOWEVER, THIS IS IMPOSSIBLE DUE TO THE ALIGNMENT PROBLEM. THE RUBBER ROLLING WHEEL HAS NO RUBBER LEFT. THIS WHEEL NEEDS TO BE REPLACED. 1A 09/13/84 PMM 00000007 840913-159-MTS OPEN
SS 00000000 ECI 00000000 1210 R 42102209 TO CIVIL CONST 10/22/84 FOR WORK

LCIWA

LCIWA-018916 7.1 TGB ROLL DOOR D62 HAS UNFINISHED WIRING TO DOOR OPERATOR. THIS PREVENTS COMPLETION OF TECH SPEC SURVEILLANCE ME-3-003. 9C 09/14/84 PME 00000007 840914-823-MTS OPEN

SS
00000000 PME
00000000 1100

WPP 09/14/84

R 24091414

LCIWA-018921 7.4 FINAL ACCESS CNTRL FACILITY HAS NO INTERCOM CAP. INTERCOM IS THE ONLY METHOD OF COMMUNCIATION THAT THE FINAL ACCESS CNTRL OFFICER HAS WITH THE REST OF SECURITY FORCE, SPEC. THE ACCESS CNTRL SECURITY OFFICERS. FINAL ACCESS CNTRL OFFICER NEEDS THE CAPABILITY TO COMMUNICATE WITH ACCESS CNTRL SECURITY OFFEICERS. SEE DOCUMENTATION. 9C 09/14/84 PE 00000007 840924-591-XFR 10/19/84 OPEN

SS
00000000 PME
00000000 1100

WPP 10/15/84
ATTN: PRUITT 9-18-84
ECD: 10-19-84

R 24101511

LCIWA-019006 7.3 PEREMENTER ZONE 1 TOP RECEIVER STAYS IN CONSTANT ALARM, AND HARD TAMPER WHEN ACCESSED. PEREMETER ZONE 17 GOES INTO A HARD TAMPER WHEN ACCESSED. 9D 09/20/84 PMI 00000007 840921-563-MTS OPEN

SS
00000000 PMI
00000000 1210

W/PETRI 09/21/84

SECURITY ZONE

R 22092015

LCIWA-019021 7.3 DOOR HANDLE ON D-271 (LOCATED ON +69 RAB) IS BROKEN. NEEDS TO BE REPLACED. WILL NOT ALLOW DOOR TO BE OPENED PROPERLY. 9E 10/04/84 PMM 00000007 841004-563-MTS OPEN

SS
00000000 PMM
00000000 1100

WPP 10/04/84

R 23100410

LCIWA-019022 7.2 CAS/SAS COMMUNICATION BASE STATION WILL TRANSMIT TO ST CHARLES PARISH SHERIFF OFFICE, BUT WILL NOT RECEIVE. THE PROBLEM SEEMS TO LIE WITH THE ST. CHARLES PARISH SHERIFF OFFICE. 9C 10/03/84 PME 00000007 841003-159-MTS OPEN
SS PME 00000000 00000000 1100
41859821 40
WPP 10/03/84
R 30101615

LCIWA-019049 7.2 GATE #1 STAYS IN CONSTANT ALARM WHILE CLOSED. LOCATED SOUTH OF VEHICLE TRAP. NOTE: GATE REPAIRED EARLIER ON THE BROKEN SHEAR PIN BY MECHANICAL MAINTENANCE. 9E 10/04/84 PMI 00000007 841025-563-MTS OPEN
SS PMM 00000000 00000000 1100
WPP 10/25/84
R 27100414

LCIWA-019077 7.3 SOME OF OUR OUTSIDE CAMERAS WHICH FACE THE SUN IN THE EARLY MORNING AND LATE EVENING NEED MORE LIGHT PROJECTION. SUGGEST THAT A PHOTO GRAY GLASS BE PLACED IN ONE OF THE CAMERA ENCLOSURE TO SEE IF THIS WILL HELP. 9F 10/05/84 PMI 00000007 841009-611-MTS OPEN
SS PE 00000000 00000000 1100
PE FOR EVAL 10-9-84
CAMERAS
R 26101809 J PHILLIPS/PRUITT

LCIWA-019078 7.3 AT APPROX 0357 HOURS, THE S.A.S. DURESS ANNUNCIATOR PANEL IN THE S.A.S. AREA (+46 LEVEL RAB REAR OF CONTROL ROOM) RECEIVED AN ALARM ON RADIO #116. NOTE: THE CAS ALARM DURESS ANNUNICATOR PANEL DID NOT RECEIVE AN ALARM NOR DID SNY OTHER RADIO (SECURITY). 9C 10/05/84 PME 00000007 841005-823-MTS OPEN
SS PME 00000000 00000000 1100
WPP 10/05/84
R 23100514

LCIWA

LP20-0002	3.0	THERE ARE CURRENTLY NO APPROVED PROCEDURES AVAIL-	9C	12/13/83		03/06/83	OPEN
		ABLE FOR DUMPING THE HISTORICAL LOG, FOR MAKING		SMI		00000000	840924-591-XFR
	20	DISC SAVES, OR FOR RELOADING FILES FROM TAPE.				TUE - P PETRI SAYS THAT THIS ITEM	
	SS	PLANT PROCEDURES NEED TO BE DEVELOPED.					
00000000	PME					(3.0 PRIORITY) WILL BE INCORPORAT	
00000000						ED INTO MI-13-200 PRIOR TO FUEL	
				T	34041711	LOADING TO PME 4-17-84AM JR	

```
END OF PROGRAM
;EOJ
CPU SEC. = 37.  ELAPSED MIN. = 3.  TUE, OCT 30, 1984, 6:25 AM
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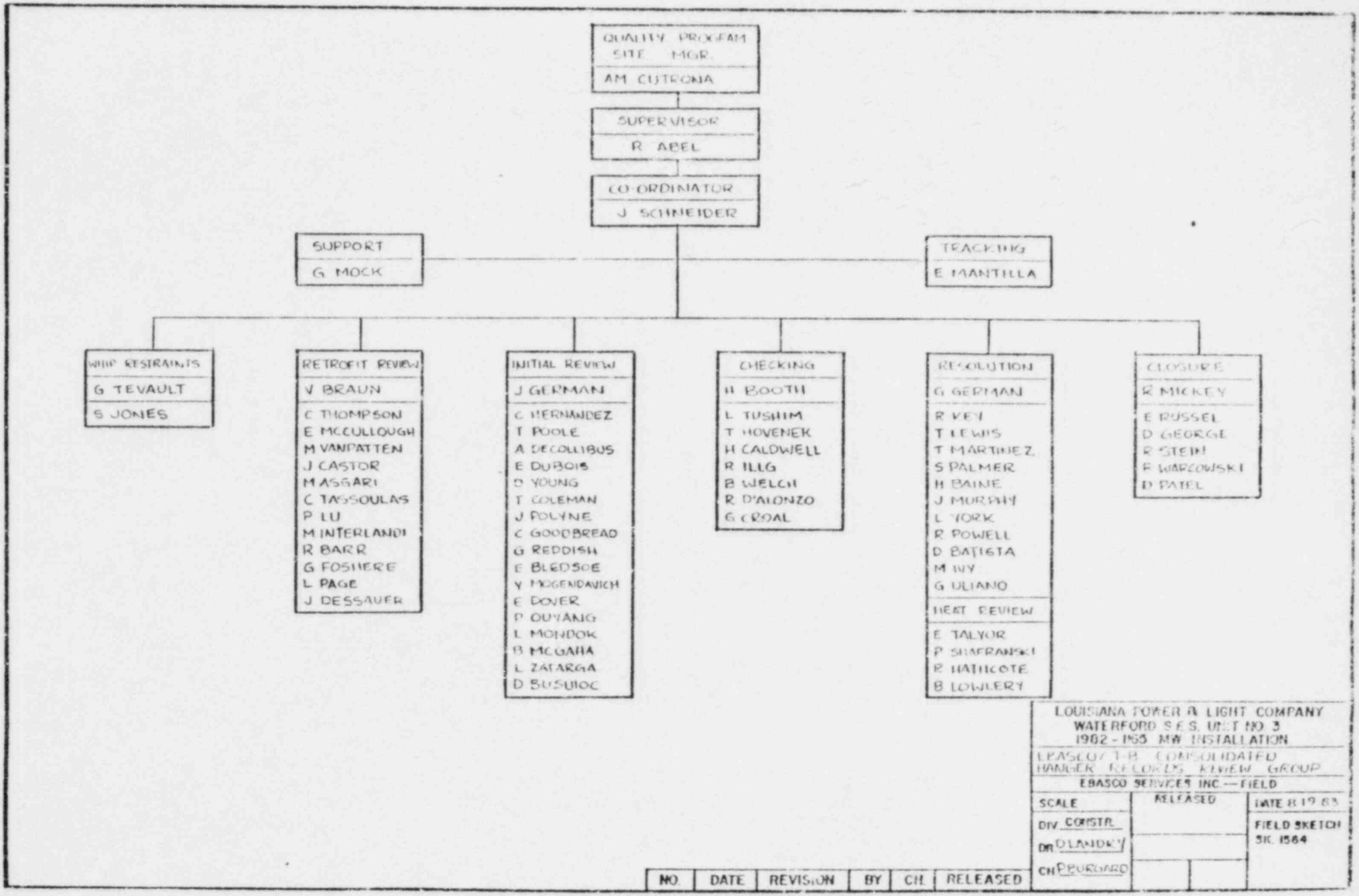
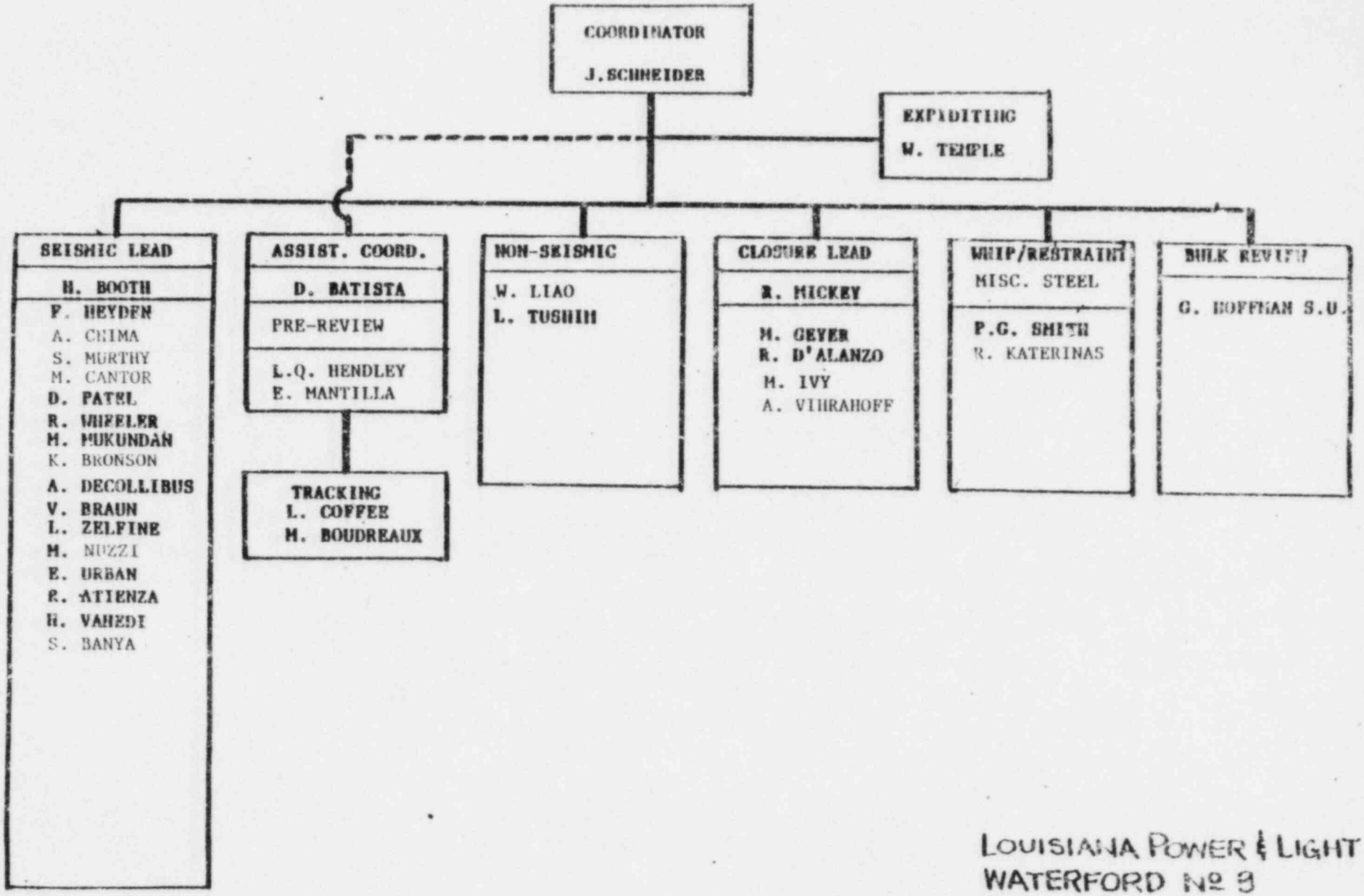


F01A-84-206
0/1

QAIRG THOMPKINS-BECKWITH HANGERS/SUPPORTS
ORGANIZATION CHART



FOIA-84-206
0/2

LOUISIANA POWER & LIGHT
WATERFORD Nº 3
J.C.S.

CHRONOLOGICAL LOG

8

Item No. 36

Title Component Cooling Water (CCW) Flow Balance and Pump Performance Test

Procedure No. SPO-36-002

DATE/TIME	COMMENTS
	I have reviewed this procedure against the latest referenced documents.
	Signature: Michael W. Tuck Date: 12/11/83
	I have held a pretest briefing and the attendees are listed below.
	Signature: Michael W. Tuck Date: 12/13/83
	Attendees: [illegible] 12-13-83
	Rodger D. Pain 12-13-83
	[illegible] 12-13-83
	[illegible] 12/13/83
	T. Stanley 12/13/83
	C. A. Whitaker 12-13-83
	Michael Tuck 12/14/83
	M S Wentz 12/14/83
	I have notified QC prior to reaching the first hold or witness point (phases I and II) or prior to performing section 7.0 (phase I if prerelease testing without an approved prerequisite test procedure).
	Signature: Michael W. Tuck Date: 12/15/83
	The following persons have performed part of the test:

Printed Name	Signature	Initials
Stephen J. Lovelace	Stephen J. Lovelace	SJL
[illegible]	[illegible]	
Michael W Tuck	Michael W. Tuck	MWT
TIM BYRNES	Tim Byrnes	TB
[illegible]	[illegible]	
Tomas Antone	[illegible]	
G.T. WERTS	M.S. Wentz	MSW

STARTUP

Preoperational Test SPO-36-002
Component Cooling Water (CCW)
Flow Balance and Pump Performance Test

Unit Waterford 3
Date 12-5-83
Revision 1

Initials & Date

TION: WHILE TAKING BASELINE DATA FOR CCW MAKEUP PUMPS, THE CCW SURGE TANK WILL OVERFLOW INTO THE WASTE TANKS. RUN THE CCW MAKEUP PUMPS ONLY LONG ENOUGH TO RECORD BASELINE DATA.

.1.5.2 When CCW Makeup Pump A bearing temperatures stabilize, open valve ~~3CC-F240A~~ 3CC-V237A/B. GW 1-13-84 TACW GW 1-13-84

.1.5.3 Record baseline data for CCW Makeup Pump A on Pump Performance Data Sheet, Attachment 8.2.1 and vibration data sheets, using hand held IRD GW 1-13-84 TACW GW 1-13-84

.1.5.4 ~~Close valve 3CC-F240A and~~ Open valve 3CC-V624-1 stop CCW Makeup Pump A. GW 1-13-84

.1.5.1 Close valves 3CC-V251A and 3CC-V237A/B. GW 1-13-84

TION: DO NOT EXCEED CCW MAKEUP PUMPS' RUNOUT CAPACITY OF 700 GPM.

TION: IMMEDIATELY STOP THE CCW MAKEUP PUMP IF ANY OF THE FOLLOWING CONDITIONS IS OBSERVED:

(1) UNUSUAL NOISE OR VIBRATION

(2) PUMP BEARING TEMPERATURE, AS READ FROM INSTALLED TEMEPRATURE INDICATOR, EXCEEDS 180 DEGREES F

000153

	Reference Paragraph	Initials & Date
3.4.11.3 A flow of at least 390 gpm can be obtained through the RCP 2A coolers.	7.3.4.2	1/14/84
3.4.11.4 A flow of at least 390 gpm can be obtained through the RCP 2B coolers.	7.3.4.2	1/14/84
3.5 CCW Makeup Pumps		
3.5.1 CCW Makeup Pumps operate in accordance with the B&W Instruction Manual for CCW Makeup Pumps (Reference 2.4.2.2, LOU-5817-2720) and Reference 2.2.1, NY-403482 (Specification LOU-1564.119), as recorded on Attachment 8.2.1, Pump Performance Data Sheet.		
(1) CCW Makeup Pump A	7.3.5.3	1/14/84
(2) CCW Makeup Pump B	7.3.5.7	1/14/84

LEASCO/1564.119*NONE*0000/00/00

LEASCO/5817.2720*NONE*0000/00/00

000111

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

TE: May 16, 1984 TIME: 1430 A.M., P.M.

RTY CALLING: C. Hackney (Name) NRC (Company)

RTY ANSWERING: J. Lewis JJL (Name) LP&L (Company)

BJECT: Waterford 3 SES FILE: 3-A45

Emergency Planning Commitments

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Charles Hackney and I discussed the following:

1. Inspection Item 50-382/8308-42 - Emergency lockers are accessible to those requiring access. Health Physics emergency lockers are now equipped with breakaway seals with padlocks removed. First Aid lockers are accessible by key contained in a box attached to the locker with a breakaway glass cover. Fire lockers are accessible by key available in the Control Room. Members of the Fire Team are provided with a key to the lockers.

2. Exercise Report Response - LP&L's response to the NRC Exercise Report will be provided by May 25, 1984.

ACTION REQUIRED:

STRIBUTION: P. Backes, R. Nelson, J. Somsel, R. Kenning, A. Cook, A. Holder

NRC: C. Hackney, W. Crossman, L. Constable

FOIA-84-206
015

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: June 7, 1984 TIME: 1215 A.M., P.M.

PARTY CALLING: J.J. Lewis JJL (Name) LP&L (Company)

PARTY ANSWERING: D.J. Perrotti (Name) NRC (Company)

SUBJECT: Waterford SES Unit 3
Emergency Plan Revision
Section 5

FILE: 3-A45

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

I called Don Perrotti to discuss his question regarding selection of personnel to fill the position of Emergency Coordinator. I told Don that LP&L will include a listing of the staff positions from which Emergency Coordinators are selected in section 5.1.2.2a of the next revision (Revision 8) of the Emergency Plan.

ACTION REQUIRED:

LP&L to revise the Emergency Plan as described above.

DISTRIBUTION: J. Lewis, P. Backes, K. Cook, R. Nelson, EP Historical File (E Plan Section 5); NRC: D. Perrotti, C. Hackney, L. Constable

FOIA-84-206
0/6

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: 6/27/84 TIME: 10:50 (A.M.,) P.M.

PARTY CALLING: P. N. Backes (Name) LP&L (Company)

PARTY ANSWERING: C. Hackney (Name) NRC (Company)

SUBJECT: Appraisal Item 382/8308-38

FILE: Project Files, Nuclear Records, EP Files

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Called Charles to inform him of status of Appendix B Item 382-8308-38. This concerns making arrangements for additional telephone service to the Emergency News Center if required during an emergency.

This item is scheduled for completion by 7/2/84. A tentative meeting is scheduled for 6/29/84. It has been difficult setting up a meeting with South Central Bell since the AT&T breakup. I requested an extension of this item until 7/27/84 to allow some schedule latitude on this. Charles agreed to the extension.

ACTION REQUIRED:

NONE

DISTRIBUTION: C. Hackney, L. Constable, J. Wilson, R. S. Leddick, F. J. Drummond, R. M. Redhead, J. Haneman, C. Baldwin, R. J. Perry, T. F. Gerrets, K. W. Cook, R. M. Nelson, R. A. Savoie

FOIA-84-206
0/7

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: June 25, 1984 TIME: 3:20 A.M., P.M.

PARTY CALLING: P.N. Backes (Name) LP&L (Company)

PARTY ANSWERING: C. Hackney (Name) NRC (Company)

SUBJECT: LP&L Commitment to training
Non-LP&L Personnel

FILE: Project Files W3F84-0091,
Nuclear Records 3-A45,
EP File N6.2.4

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Returned Charles Hackney's call. Charles had called to inform me that his notes showed our commitment was to train all non-essential on-site LP&L personnel by fuel load and non-LP&L personnel prior to exceeding 5% power. This was our understanding from the 84-23 inspection. Charles wanted to clarify this since there was a question on this item that surfaced during the 84-33 exit meeting.

Also, Charles had talked to D. Perrotti regarding escorting of personnel. They agreed not to suggest plan or procedure changes.

ACTION REQUIRED:

NONE

DISTRIBUTION: J.J. Lewis, A.S. Lubinski, R.J. Perry, Project File, Nuclear Records, EP File, Licensing Library, R.P. Barkhurst, D. Packer, J. O'Hern, R.S. Leddick, W. Morgan, C. Hackney

FOIA-84-206
0/8

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: June 28, 1984 TIME: 0940 A.M., P.M.

PARTY CALLING: C. Hackney (Name) NRC (Company)

PARTY ANSWERING: J. Lewis (Name) LP&L (Company)

SUBJECT: Waterford 3 SES
Emergency Preparedness
Inspection 84-23
Docket No. 50-382

FILE: 3-A45

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

REFERENCE: LP&L Letter W3F84-0062 of June 18, 1984 to E.H. Johnson from R.S. Leddick

Charles called to discuss item 8.a. in the reference letter. In this item, LP&L refers to a commitment to develop a new training course for non-essential personnel who work on-site outside the protected area. The parenthetical phrase "(excluding parking lots)" is contained in this item.

Charles indicated that this exclusion was not discussed in the exit meeting and stated that he would address this in a written response.

ACTION REQUIRED:

DISTRIBUTION: S. Alleman, J. Lewis, P. Backes, D. Packer, J. O'Hern
NRC: C. Hackney, L. Constable

FOIA-84-206
0/9

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: July 24, 1984 TIME: 9:30 A.M., P.M.

PARTY CALLING: C. Hackney (Name) U.S. N.R.C (Company)

PARTY ANSWERING: P. Backes (Name) LP&L (Company)

SUBJECT: Operator Walk-throughs 8308-118 and 8308-120

FILE: W3F84-0125 3-A45, EP File

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Charles returned my call from earlier in the morning. We agreed to reschedule the completion of the walk-throughs (appraisal items 8308-118 and 8308-120) until August 24, 1984. This will allow walk-throughs with all personnel consistent with the operator requalify program.

ACTION REQUIRED:

NONE

DISTRIBUTION: C. Hackney, L. Constable, W. Crossman, J. Wilson, D. Packer, C. Toth, R. Savoie, R. Nelson, J.J. Lewis, Project Files, Nuclear Records (2), Licensing Library

FOIA-84-206
0/10

DOCUMENTATION OF
TELEPHONE COMMUNICATION

DATE: August 28, 1984 TIME: _____ A.M., P.M.

PARTY CALLING: J. Lewis (Name) LP&L (Company)

PARTY ANSWERING: D. Perrotti (Name) NRC (Company)

SUBJECT: Waterford 3 SES
Emergency Plan
Deletion of Appendix A

FILE: W3F84-0152, 3-A45
EP File

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

I called Don to discuss the possibility of deleting Appendix A (Mutual Assistance Plan) of the Plan. We discussed the fact that the INPO Emergency Resources Manual provides the same information for the signatory utilities as the Mutual Assistance Plan - and that the utilities are signatory to the INPO Voluntary Assistance Agreement for fixed nuclear facilities.

Don and I agreed to the following (should LP&L proceed with the change deleting Appendix A):

1. The cover letter transmitting the Plan revision should make it clear what we have done and why - and that all Mutual Assistance Plan utilities are covered by the INPO agreement.

2. LP&L is deleting Appendix A in light of the INPO document, not simply deleting Appendix A.

3. The INPO document will be referenced, but not included physically in the Plan.

4. LP&L will ensure the Plan describes what resources can be obtained through the INPO Emergency Resources Manual.

5. LP&L will ensure the Plan provides the authority for the Emergency Coordinator or EOF Director to request assistance from INPO resources via the INPO Emergency Resources Manual.

ACTION REQUIRED:

DISTRIBUTION: P. Backes, J. Lewis, B. Cope, D. Perrotti (NRC), C. Hackney (NRC), L. Constable (NRC), Project Files, Licensing Library, EP File Administrative Support (2)

FOIA-84-206
0/11

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

TE: May 11, 1984 TIME: 1445 A.M., P.M.

RTY CALLING: J. Somsel/J. Lewis LP&L
(Name) (Company)

RTY ANSWERING: W. Crossman NRC
(Name) (Company)

BJECT: Waterford 3 SES FILE: 3-A45

Docket 50-382/84-02 and 50-382/84-10

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

We called Mr. Crossman to inform him of two (2) commitments for which LP&L requests extension from the current commitment date. These items are listed below with justification for extension request and the new commitment dates:

1. LP&L Response to Inspection Report 50-382/84-10 - This report is dated April 5, 1984. LP&L received this report on April 10, 1984. The report states in part, "The response should be sent to this office within 30 days from the date of this letter". LP&L has not submitted this response due to work on other commitments. This response will be submitted by May 18, 1984.

2. Inspection Item 50-382/8402-03 - This item is scheduled for completion on May 15, 1984. This item will not be completed until May 30, 1984 due to Training Department and Emergency Planning Department manpower considerations. This item will be completed by May 30, 1984.

ACTION REQUIRED:

STRIBUTION: F. Drummond, K. Cook, R. Nelson, P. Backes, J. Somsel, J. Lewis

NRC - C. Hackney, L. Constable

FOIA-84-206
0/12

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: November 15, 1984 TIME: 3:15 A.M., P.M.

PARTY CALLING: C. Hackney (Name) NRC (Company)

PARTY ANSWERING: J. Lewis (Name) LP&L (Company)

SUBJECT: Exercise Schedule, Evacuation/ Accountability Drill

FILE: W3F84-0134, 3-A45, A4.05

REFERENCES: Telephone Documentation W3F84-0183 dated October 11, 1984 (attached)

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Charles returned my earlier call.

Charles and I discussed the contents of the referenced telephone conversation. It was emphasized that elimination of the ± or - 25% "window" for exercises, and other EP activities, that most utilities use is a consideration. The elimination of this "window" has not yet been promulgated as NRC policy.

We also discussed a date for Charles to evaluate an evacuation/accountability drill. Charles took the dates I gave him under consideration and asked that I call him again on November 20, 1984.

ACTION REQUIRED:

J. Lewis to call C. Hackney on November 20, 1984 for further information-confirmation of accountability drill date.

DISTRIBUTION: S. Alleman, R. Azzarello, P. Backes, J. Lewis, K. Cook, R. Nelson, G. Wuller, C. Hackney, L. Constable, Licensing Library, Project Files, Administrative Support, EP File N.6.1

FOIA-84-206

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: October 11, 1984 TIME: 1400 A.M., P.M.

PARTY CALLING: J. Lewis (Name) LP&L (Company)

PARTY ANSWERING: C. Hackney (Name) NRC (Company)

SUBJECT: Waterford 3 SES FILE: 3-A45, W3F84-0183

Annual Exercise Frequency

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

I called Charles to discuss a tentative exercise date of March 20, 1985. Charles indicated that the annual date for our exercise would be February 8, 1985 because we held our first exercise on February 8, 1984. We discussed the idea of a "window" of + or - 25% of a required frequency as given in Technical Specifications. Charles stated that Technical Specification surveillance frequencies do not apply to exercise frequencies or any other required emergency planning activities. In effect, the + or - 25% window does not exist for these activities. Charles indicated that we must apply for an exemption if we will not complete an activity by the anniversary date (i.e., exercise scheduled beyond February 8, 1985).

There was some question as to how these requirements apply to NTOLs (LP&L is not yet a licensee).

ACTION REQUIRED:

DISTRIBUTION: S. Alleman, P. Backes, J. Lewis, K. Cook, R. Nelson, G. Wuller, C. Hackney, L. Constable, Licensing Library, Project Files, Administrative Support, EP File

FOIA-84-206

0/14.

W3F84-0183
Telephone Documentation
October 11, 1984

SUMMARY CONT'D.

I called Charles again on October 12, 1984 to get more information on the requirement for NTOLs after giving him time to discuss this with other NRC personnel. Charles stated that, because we are not yet a licensee, the only requirement we must meet is the one in 10CFR50 Appendix E Part F.1.b. This requires a full scale exercise... "within one year before issuance of the first operating license for full power, and prior to operation above 5% of rated power"... Charles indicated that a March 20, 1985 exercise is acceptable, but that our exercise anniversary would then be March 20 for following years. This is the case providing LP&L receives a full power operating license by February 8, 1985. If LP&L will not have a full power OL by then, we are required to hold another full-scale exercise prior to issuance of the license or apply for an exemption allowing the 1984 exercise to fulfill the "within one year of the first operating license for full power" requirement.

DOCUMENTATION OF
TELEPHONE COMMUNICATIONS

DATE: August 22, 1984 TIME: 2:30 A.M., P.M.

PARTY CALLING: C. Hackney (Name) NRC (Company)

PARTY ANSWERING: J. Lewis (Name) LP&L (Company)

SUBJECT: Waterford 3 SES W3F84-0150, 3-A45

Emergency Preparedness Program EP File

Emergency Preparedness Inspection
Responses 50/382 - 8402, 8410

SUMMARY: (INCLUDING DECISIONS AND OR COMMENTS)

Charles returned my earlier call.

The following completion date changes were agreed to because of the current schedule for LP&L procedure development and review, and manpower allocation for facilities changes (affecting item 8410-29 only):

Item	Old Completion Date	New Completion Date
8402-05	September 1, 1984	November 1, 1984
8402-06	September 1, 1984	November 1, 1984
8410-04	September 1, 1984	November 1, 1984
8410-07	September 1, 1984	November 1, 1984
8410-16	September 1, 1984	November 1, 1984
8410-19	September 1, 1984	November 1, 1984
8410-24	September 1, 1984	November 1, 1984
8410-27	September 1, 1984	November 1, 1984
8410-29	September 1, 1984	November 1, 1984
8410-31	September 1, 1984	November 1, 1984
8410-32	September 1, 1984	November 1, 1984

ACTION REQUIRED:

DISTRIBUTION: P. Backes, J. Lewis, R. Nelson, G. Wuller, C. Hackney (NRC), L. Constable (NRC), Project Files, Administrative Support, Licensing Library, EP File

FOIA-84-206
0/15

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

SGPR:CEG
50-382

AUG 2 1983

MEMORANDUM FOR: Glen D. Brown, Chief
Technical Programs Branch
Region IV

FROM: George W. McCorkle, Chief
Power Reactor SG Licensing Branch
Division of Safeguards, NMSS

SUBJECT: SYSTEMATIC ASSESSMENT OF LICENSEE PERFORMANCE (SALP)
WATERFORD STEAM ELECTRIC STATION

Enclosed are our evaluations of the applicant's performance for the safeguards licensing portion of the SALP review for the subject sites during the Period July 1, 1982 through June 30, 1983.

George W. McCorkle, Chief
Power Reactor SG Licenisng Branch
Division of Safeguards, NMSS

Enclosure:
As stated

cc: J. Wilson, ORB #3, NRR
C. Thomas, NRR

CONTACT:
C. E. Gaskin, NMSS
42-74383

~~4912740318~~ 2pp.

FOIA-84-206
0/17

SALP INPUT EVALUATION

WATERFORD SAFEGUARDS REVIEW

Criteria	Category
1. Management Involvement and Control in Assuring Quality Applicant has provided little evidence of prior planning and proper prioritization of safeguards matters. Corporate and site management rely heavily upon contractors and display little knowledge of site activities.	3
2. Approach to Resolution of Technical Issues from a Safety Standpoint. Applicant meets the minimum requirements in demonstrating an understanding of safeguards issues. Approaches to technical issues are generally technically viable, sound, and conservative.	2
3. Responsiveness to NRC Initiatives Licensee provides responses in a timely manner.	1
4. Enforcement History	N/A
5. Reporting and Analysis of Reportable Events	N/A
6. Staffing (Including Management) The authority and responsibilities associated with the security organization positions are identified.	2
7. Training and Qualification Effectiveness The safeguards training and qualification program is defined and contributed to an adequate understanding of work.	2

NRR

LOUISIANA POWER & LIGHT / 142 DELARONDE STREET • P.O. BOX 6008
NEW ORLEANS, LOUISIANA 70174-6008 • (504) 366-2345

MIDDLE SOUTH UTILITIES SYSTEM

May 15, 1984

W3P84-1389
3-A45

Director of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Revised Emergency News Center and Corporate
Command Center Instructions

Dear Sir:

In accordance with 10CFR50.47, please find enclosed two copies of revised LP&L Corporate Command Center and Emergency News Center Instructions.

This amendment contains personal information which is not to be disclosed to the public. Therefore, two attachments are being provided to you: Attachment 1 includes the copies provided for NRC use containing the personal information; Attachment 2 is provided for public disclosure and duplicates Attachment 1 except that the personal information is blanked out.

This transmittal consists of the following:

1. NSI-401, Notification and Assignment of Corporate Command Center Staff, revision 1.

2. NSI-402, Emergency Director Instructions, revision 1.

3. NSI-403, Treasury and Accounting Manager Instruction, revision 1.

4. NSI-404, Administration/Logistics Manager Instruction, revision 1.

5. NSI-405, Government/Public Affairs Manager, revision 1.

6. NSI-406, Support Engineering Manager, revision 1.

7. NSI-407, Fossil Operations Manager, revision 1.

8. NSI-408, Security Coordinator Instruction, revision 1.

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9. NSI-409, Corporate Command Center, LP&L Emergency News Center and Back-up Emergency Operations Facility Security Instructions, revision 1.

10. NSI-410, Corporate Command Center Recovery Operations, revision 1.

11. NSI-411, Corporate Command Center Resource Document, revision 1.

12. NSI-412, Corporate Command Center Document Control Instruction, revision 0.

13. NSI-413, Division Operations Manager Instruction, revision 0.

14. NSI-414, Logistics Coordinator Instruction, revision 0.

15. NSI-421, Emergency News Center Activation, revision 1.

16. NSI-422, Emergency News Center Director Instruction, revision 1.

17. NSI-423, Public Information Manager, revision 1.

18. NSI-424, Communications Manager Instruction, revision 1.

19. NSI-425, Emergency News Center Office Manager Instruction, revision 1.

20. NSI-426, Offsite Agency Coordinator, revision 1.

21 NSI-427, Technical Spokesperson Instruction, revision 1.

22. NSI-428, Media Monitoring/Response Supervisor Instruction, revision 1.

23. NSI-429, Employee Information Supervisor, revision 1.

24. NSI-430, Rumor Control Supervisor, revision 1.

25. NSI-431, Auditorium Supervisor Instruction, revision 1.

26. NSI-432, Media Response Assistants Instruction, revision 1.

27. NSI-433, Media Monitoring Assistants Instruction, revision 1.

28. NSI-434, Middle South Services (MSS) TV Recording Assistant, revision 1.

29. NSI-435, Offsite Public Relations Representative, revision 1.

30. NSI-436, Rumor Control Operators, revision 1.

31. NSI-437, Emergency News Center Artist Instruction, revision 1.

32. NSI-438, Audio-visual Operator Instruction, revision 1.

33. NSI-439, LP&L Emergency News Center Recovery Operations, revision 1.

34. NSI-440, Word Processor Operator, revision 1.

35. NSI-441, Emergency News Center Resource Document Instruction, revision 1.

36. NSI-442, Emergency News Center Document Control Instruction, revision 0.

Please incorporate these documents into your volumes, superceded documents should be destroyed.

If there are any questions pertaining to this submittal, please contact P. N. Backes at (504) 464-3347.

Yours very truly,

F. J. Drummond
Manager-Nuclear Services

FJD/PNB/jse

Attachments

cc (w/o Attachment): E. L. Blake, W. M. Stevenson, G. L. Constable, J. Wilson, D. Perrotti, C. Hackney, S. E. Turk

cc with Attachment: 2 copies

Mr. J. T. Collins
Regional Administrator, Region IV
U.S. Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011