Chapter 7 TROUBLESHOOTING

7.1 Submersible Pumps

Mechanically speaking, there is no periodic maintenance to do on these pumps.

If they are defective, they must be replaced as a unit. The pumps or electric motor cannot be repaired, just replace the complete unit motor and pump. The key to avoiding problems with the pumps or electrical motor is a good installation procedure.

The submersible pump motor needs a good, water tight electrical connection, especially for the underwater part of the wiring. This three-phase motor can run in either direction depending on how it is connected to the power supply. When the three cable leads are first connected to the power supply, there is only a 50 % chance that the motor will run in the proper direction.

During the replacement of a pump, special care must be taken to rebuild electrical connections with compressed lugs and heat shrink, following the instructions in this manual.

After replacing the pump, if it does not deliver the expected flow, check the direction of rotation. Rotation can be reversed by exchanging any of the three wires feeding the pump.

Great care must be taken to rebuild these connections. Failure to do so will result in faulty conditions listed below.

7.2 Truck Fill "Start button is pressed but does not start pump"

A) Is power present in building from NPC and/or Generator? (regular lighting is on and emergency lights are off?)

B) Is the corresponding pump insulation contactor beside the door live and red light on, if not, check the following: Is the selector on the insulating contactor on auto? Turn selector to run for trouble shooting purposes. If pump does not start, continue investigation.

1) Is there a ground fault indication on the VFD control push the reset button? If you are unable to reset the pump, the motor is defective to ground. Confirm with a 1000 volts megger insulation condition on pump. If test shows a resistance less than 1 meg ohms, pump motor needs to be replaced.

2) Is the red indicating light live on the contactor with the selector positioned to Run? If it is not:

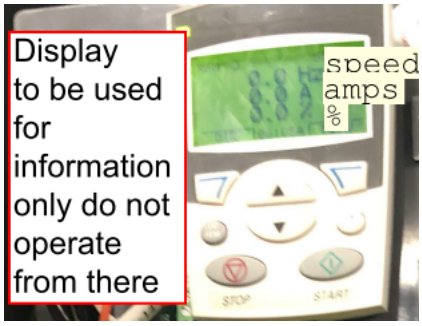
    - Try the other pump turn selector to run. If also dead, problem could be related to control panel 120 volts AC power source.
    - Check and replace fuses as required. If control continues to burn the fuses, find a control technician for repair.

7.3 Pump Soft start VFD

The main function of this electronic device is to start and stop the pumps. It provides the submersible pump with a progressively increasing frequency and current giving a smooth and gradual pressure increase at strainer inlet and filter inlet.

At pump stop speed will gradually and smoothly decrease.

Information on VFD status



7.4 Pump failure -Removal of Pumps for Servicing

If previous troubleshooting clearly indicates a pump malfunction, then we must plan to replace the pump.

Step 1: Call the Area Maintenance Officer.

Step 2: Disconnect the intake line from the building piping.

Step 3: The intake line is about 100 ft long., guide the pipe outside by pulling it out.

Step 4: Pull the pump into the building. Do not let the pump drop onto concrete floor.

7.5 GENERAL

7.5.1 Auto-Dialler Calls

- Fire Alarm.
- Panel Alarm

7.5.2 Alarm Interface is not working properly

- Verify the fuse on the main control panel.
- Validate if the interface is well connected behind the Interface door If it is not, connect it.
- If is still not working, call 855-437-4001 for Technical support.

7.5.3 Building Low temperature

- Verify thermostat settings for the individual Unit Heaters (UH-1 @ UH-5) and the furnace. If the temperature is below 10°C, boost thermostats to 20°C. Wait 10 minutes and validate. If they do not work properly refer to Chapter 27.Go to step 7.5.4.

7.5.4 The furnace does not work properly

- Validate if the fuel pumps are working properly.
- If the fuel pump's control panel displays LLA (low level alarm) check the main tank level.
- If the level ok check exterior supply valves on fuel line.
- If outside valve is closed push and hold for five minutes and start push button on control panel, after a delay, the tank filling will resume normal operation.
- Validate if the furnace is functioning properly, if not, go to Chapter 20.

7.5.5 The Fuel Pumps does not work properly

- Validate if Fuel Pumps are in AUTO mode. If not, select AUTO mode.
- Pumps should start and fill up day tank.
- Validate if fuel is available in the day tank. If not, validate if fuel is available in the main tank. If the fuel level is low, phone the supplier for more fuel.
- If fuel pumps are not pumping, Refer to the fuel pump manual Chapter 25.

7.5.6 Fire Alarm system does not work properly

- Fire heads are only connected to the alarm panel as a high temperature alarm, no supervision is available on these sensors

7.5.7 Unit Heater systems are not working properly

- If Unit Heater are not working properly, refer to Chapter 27

7.5.8 Damper Actuator is not working properly

- If Damper Actuator is not working properly, refer to Chapter 23

7.6 MAINTENANCE

The following outline for a maintenance program is general information and is an essential, effective, economic, and safe operation of mechanical equipment, systems and services.

The key to generally low maintenance costs for the system is a standard preventative maintenance program based upon the manufacturer's recommended procedures.

With the sophistication of mechanical systems for environmental control, there is a greater need for proper operation and maintenance of the systems to avoid costly breakdowns or failure in performance. The total cost of such breakdowns includes not only the cost of necessary repairs and the replacement of damaged parts, but also the loss of use, inconvenience, down time and possibly partial or even complete shutdown of the facility.

Sound operating procedures and maintenance programs as itemized below, can serve to achieve these benefits:

1 Become familiar with the manufacturer's information in the operating manuals,

2 Stocking an adequate supply of spare parts.

3 Develop a program and provide an adequately managed and trained staff to implement the program.

4 Consider an option of a service contract for all specialized systems such as refrigeration systems and automatic controls.

7.7 Preventive maintenance and Safety

To ensure uninterrupted use, equipment should be regularly inspected, tested and proper repairs made and recorded.

The objective is to minimize equipment operating problems and prevent failures by making minor or necessary repairs before major difficulties occur. The importance of record keeping cannot be over emphasized. Good maintenance protects the Owner's interest with manufacturer warranties, continuity of maintenance despite staff turnover and equipment reliability track record.

Environmental and operating conditions are key elements affecting proper and reliable operating of equipment.

Costly repairs can be minimized if the following items are attended to -

KEEP IT TIGHT
KEEP IT CLEAN

Day-to-day accumulation of normal atmospheric particles lint, metallic particles from mechanical equipment cause problems with equipment over a long period of time, as accumulation affects equipment reliability and operating life. **ALL equipment should be regularly cleaned.**

7.8 Keep it Tight

All dynamic equipment and control devices operate with high speed movement. This motion creates vibration that can loosen hardware and other parts. External vibration from equipment may cause the loosening of hardware and connections in any equipment. **All hardware and connections should be tightened regularly**. This simple procedure takes only a small amount of time and can save hours of searching for intermittent problems. All rotating equipment such as motors is affected by vibrations causing alignment problems resulting in bearing failures.

7.9 Renewal Parts

Availability of parts can be a major problem in **IGLOOLIK**.

Delivery can be delayed for many reasons including the weather. For this reason, local distributors should be contacted, and the availability of parts assessed. Any critical part affecting the reliability of the system should be ordered, recorded and stored.

7.10 Schedule Maintenance Program

Scheduled maintenance is an effective means to improve service from systems and equipment. Where failure of equipment can result in shut down, scheduled maintenance is an economical alternative.

Most maintenance can be done by average personnel, with a minimum need for specialized services.

7.11 Causes of equipment failure

An effective maintenance program will attempt to remove or reduce causes of equipment failure. Common causes of failure are:

1 Clogged filters

2 Improper lubrication and oiling or lack of

3 Persistent overloading

4 Above normal temperatures

5 Below normal temperatures

6 Obstruction of system by foreign objects or material (blockage or air, dirt on components -etc.)

7 Normal deterioration

8 Severe weather conditions.

7.12 Maintenance list

Refer to spare parts list