.16 Press the HI TEMP SEEN key, then the NEXT key. The #1 LOW=???.? C RESET function option is displayed. YES will reset the present temperature being measured as the new low value. NO will retain the low temperature read previously. Normally leave the setting at NO.

.17 Press the DATA HIGHWAY key, then the NEXT key. The DATA HIGHWAY ON ENABLE function option is displayed. Set this option to NO, unless connecting to a computer.

.18 Press the HI TEMP ALARM key. The #1 HI TEMP ALARM SET function option is displayed. This value should be left at the default value, unless consistent false alarms are occurring. Try increasing the setting to reduce false alarms.

.19 Press the HI TEMP ALARM key, then the NEXT key. The #1 HI TEMP ALARM TRIP TRACER function option is displayed. This value should be set to YES. This will shut off the heat trace if the set HI TEMP is exceeded. Tripping the tracer could prevent possible melting through the intake pipe.

.20 Press the HI TEMP ALARM key, then the NEXT key twice. The #1 RTD FAILURE TRIP TRACER function option is displayed. This value should be set to NO. This will enable heat tracing even with a failing RTD sensor. An alarm will sound, and the problem must be remedied as soon as possible to ensure safe operation.

.21 Repeat the programming of steps .18 through .20 for tracer #2 by using the NEXT key.

.22 Press the TRACER CURRENT key. The CURRENT CLAMPING #1 ENABLE function option is displayed for tracer #1. Normally set this value to NO. This setting will not restrict amperage allowed to the heat trace.

Any alarm conditions that occur with either tracer, the TS 202 will illuminate the ALARM ON indicator and alternate the Main Operations Display with the ALARM CODE display and corresponding tracer circuit. Any alarms can be acknowledged by pressing the ACK key on the heat trace controller. The alarm will also have to be acknowledged on the Panalarm in the main control panel. Acknowledging an alarm does not clear its condition.

For TRIP ALARMS, the alarm must be acknowledged before automatic control of the heat trace system is restored. Consult section 9.11 Appendix A of the TS202 programming manual for details on alarm messages.

6.3.5 Heating System

Heat is supplied to the truckfill station on the pumps side by two electric radiant heaters mounted on the ceiling. The generator supplies the heat on the generator side of the truckfill station.

The heaters are controlled by a thermostat and a proportional controller. The thermostat for each heater controls the room temperature. They should be both set to the same value. The normal setting is 16°C. This temperature is above the low temperature alarm setting of 13°C and below the high temperature alarm setting of 35°C. The setting should always be between the high and low alarm temperatures. There should not normally be a need to change the thermostat settings.

The amount of heat provided by the heaters is controlled by the proportional controllers located beside each thermostat. These controllers can be set from MIN to MAX which determines the time that the heater is turned on per cycle. If the heaters are failing to maintain room temperature, the controller settings can be increased. In warmer weather, the controller settings can be reduced.

For fast warmup of the building, adjust the proportional controllers to MAX (100%). This is recommended if personnel are going in and out of the pumphouse frequently in cold weather, i.e. servicing.

6.3.6 Fuel Supply

The fuel supply system for the generator is automatic and requires no operation except for regular filling of the fuel tank with diesel. A minor and major alarm are associated with different a low and high level respectively.

The fuel tank must be filled from the outside at the vent/cap on top of the fuel tank. Care should be taken during filling that no fuel is spilled.

6.4 SPECIAL PROCEDURES

6.4.1 Truckfill Pump Removal

If the truckfill pump, or other equipment within the intake casing, fails, the intake pipe and all attached equipment can be removed from inside the truckfill station. DO NOT attempt to remove the pump unless an electrician is present to disconnect the power cables.

It has been found that the winch for removal of the intake pipe is useful for the initial start, but that a loader or truck connected to the cable reduces the time required for

removal. Care must be taken when using a vehicle to assist removal to ensure that the cable is not snapped which could cause injury, and make the remaining pump removal extremely difficult.

Water from the pumphouse will not be available during the pump removal and replacement.

Location: All of the following procedures can be completed within the truckfill station or just outside the door.

.1 **Location**: At the main breaker panel.
Turn off the breakers for the truckfill pump and the heat trace controllers.

.2 **Location**: At the UPS controller.
Turn the UPS controller switch to OFF. This will turn off the control panels.

.3 **Location**: At the intake casing.
Turn the truckfill pump starter to the OFF position.

.4 Disconnect the truckfill pump power cable from the starter. This must be done by a **certified electrician**.

.5 Unplug the heat trace cables from the receptacle.

.6 Disconnect one of the victaulic fittings on the truckfill pipe closest to the intake casing.

.7 Move the truckfill pipe out of the way. More fittings may need to be removed to accommodate the pump removal.

.8 Remove the outer set of bolts on the intake casing flange.

.9 Loosen the inner set of bolts on the flange which loosens the rubber plug.

.10 Pull the flange and plug out of the casing.

.11 Remove the bolts from the flange.

.12 Remove the flange and plug.

.13 Set the winch stand pipe in the hole in the floor.

.14 Wind the intake pull cable onto the winch.

.15 Winch out the intake pipe, carefully supporting the pipe and cables. Once the pipe is a meter or so out of the casing it may be easier to connect the cable to a loader to continue pulling.

.16 Carefully support the pipe and cables during pulling. Watch for snags, and any wedging that may occur during removal.

.17 The pipe is approximately 80 metres long and will go out the door.

.18 Once the pipe is pulled, the pump, heat trace RTD sensors, or heat trace cables can be maintained, repaired or replaced.

.19 Reverse the above procedures to replace the pump and pipe.

6.4.2 Programming the Emergency Autodialer

The general steps for programming the emergency autodialer are summarized in this section. A standard touch tone telephone is used for inputting program options. For a detailed description regarding the emergency satellite/autodialer phone system, consult Section 9.15 of the manual.

Following are the general steps for programming the autodialer:

.1 Enter the Telephone Directory - Obtain a list of the telephone numbers (8 numbers maximum) you want the autodialer to call.

.2 Select the Communication Format for Each Number - For each number decide whether it will be used for a voice or pager, as the autodialer will send a different signal depending on the answering mode.

.3 Link Inputs to the Telephone Directory - Order the telephone numbers in the priority that you wish the autodialer to call for different alarm conditions. Using the prioritized list, the autodialer can be programmed to know which available numbers it should call, in what order, and for which input. Note that different inputs may call different numbers. For example, with the Arctic Bay Truckfill Station, an alarm condition for low fuel may call the fuel distributor, while an alarm condition for a failed generator may call the Truckfill Station Maintainer.

.4 Record Voice Messages - The common identification voice message and the individual channel messages are recorded for the human listeners.

.5 Enter Pager Numbers - For phone numbers with pagers, the numerical messages to be displayed by the pagers are entered.

.6 Enter Communication Choices and Input Modes - This step would be programmed where delays before dialling, delays before transmitting, or waiting for a dial tone would be required. An option for repeating the voice message may also be set here.

.7 Call Options - This step allows programming for the number of call sequences, and a redial delay time.

.8 Input Detection Mode - The input detection mode can be set to Standard Detection Mode (SDM), or Pulse Bell Detection Mode. Set this option to SDM as a touch tone telephone was supplied for programming the autodialer.

.9 Verify Programming - This step allows the user to read the programming. Using the touch tone telephone, the autodialer will display the programming content for various locations.

It is recommended that the programming be tested. Inform the receivers of calls that you will be testing the system so that they do not react on the alarm calls. Simply invoke each of the alarm conditions (inputs), and verify that the autodialer is calling the correct telephone numbers.

6.5 TROUBLE SHOOTING PROCEDURES

6.5.1 Alarm System

The alarm system for the Arctic Bay truckfill station consists of an external horn, a flashing strobe beacon, and an autodialer to indicate the alarm. There is a ten point alarm annunciator set into the front of the main control panel, even though all ten positions are not occupied by an alarm. The record drawings and control panel schematics in Appendix A, and Section 9.9 respectively show the physical layout of the annunciator within the panel. Alarms are indicated by a red light flashing on the annunciator. Alarms sound the outside horn, the strobe beacon flashes, and the autodialer calls the Hamlet Office.

The alarm annunciators each have four control buttons: ACK, FLRST, RST, and TEST. The TEST button causes each alarm light to illuminate while it is pressed. The FLRST (flash reset) button is not used with the operating mode the annunciators are programmed for in this facility. The ACK (acknowledge) button stops the flashing and horn, but the alarm light remains lit. The RST (reset) button cancels all alarms. However, if a device continues to send an alarm to the annunciator, the RST button will not reset that alarm.

The alarms are emergency conditions which may result in a failure of the facility to deliver treated water as required or may result in damage to the facility or persons. Therefore, these alarms are to be treated as emergencies and must be corrected immediately. To ensure that alarms are corrected immediately, the alarm annunciator is connected to an external horn and strobe beacon.

The alarms are listed, along with the response to each alarm condition.

Alarms

.1 Generator Room Low Temperature and Pump Room Low Temperature

These two alarms are transmitted from the low temperature alarm thermostats. The indicate that the room temperature are lower than the set point (initially set at 10 °C) and may indicate a heater failure, or ventilation fault. THIS ALARM MUST BE DEALT WITH PROMPTLY TO ENSURE THAT THE FACILITY AND INTERNAL EQUIPMENT DOES NOT FREEZE. Freezing of water within the facility may cause very severe damage to the piping, UPS batteries, and chlorine injector.

One of the following conditions may be causing the alarm:

- The building thermostat may have failed and the infrared heater is not operating.
  - Acknowledge the alarm annunciator (ACK). Increase the setting on the building thermostat to above room temperature, and turn on the infrared heaters. Have an electrician repair the heating system if the heaters do not turn on.

- The building thermostat may be set too low.
  - Acknowledge the alarm annunciator (ACK). Increase the setting on the building thermostat to above the low temperature alarm thermostat setting. Wait a few hours for the building to warm. The alarm light should turn off when the room temperature rises above the alarm thermostat setting.

- The low temperature alarm thermostat may be set too high.
  - Acknowledge the alarm annunciator (ACK). Decrease the setting to approximately 10 °C. The alarm light should turn off as long as the room temperature is above 10 °C.

- The low temperature alarm thermostat may have failed.
  - Acknowledge the alarm annunciator (ACK). Check the thermostat for function by decreasing the setting to below the room temperature. The alarm light should turn off. If the thermostat fails to operate properly, have an electrician repair the heating system.

- The outside temperature may be very low and doors or vents may be open. Therefore, the heaters may not be able to heat the building to the thermostat setting.
  - Acknowledge the alarm annunciator (ACK). Ensure the door is not open, and look for major air leaks. Seal up the building as well as possible.

- The ventilation system may not be operating correctly. Therefore, the generator may not be able to heat the generator side of the building to the thermostat setting.
  - Check the fan box, and dampers for correct operation on the generator side of the truckfill station. The actuators may not be closing the dampers, or the dampers may be sticking. If the ventilation system is suspected of malfunctioning, an electrician may be required for servicing the ventilation system.

.2 Heat Trace Alarm

An alarm will be activated when the heat trace controller sends an alarm signal to the control panel. Consult the TS202 Programming Manual, Appendix A for specific alarm messages, and potential problems. Also refer to section 6.3.4 and the TS202 Programming Manual for programming details if required.

The heat trace alarm on the control panel can be cleared by taking the following actions:

- Acknowledge the alarm on the heat trace controller by pushing the ACK button.

- Acknowledge the alarm on the control panel by pushing the black ACK button on the panel, and then the red ACK button on the panalarm.

- Determine the cause of the alarm.

- After resolving the problem, press the RST button on the Panalarm to clear the alarm.

.3 Voltage Transfer Switch Alarm

The alarm is activated when the transfer switch is sending a signal that the voltage is incorrect.

- Acknowledge the alarm on the panalarm by pressing the ACK button. An electrician is needed to confirm this alarm case. If the alarm is confirmed, further services to repair the problem may be required from an electrician. If the electrician confirms that the alarm is false, the RST button can be pushed.

.4 Uninterruptible Power Supply Alarm

An alarm will be activated if the generator power fails. The UPS will be engaged and the alarm will continue until the prime power is restored.

The UPS alarm on the control panel can be cleared by taking the following actions:

- Acknowledge the alarm on the control panel by pushing the red ACK button on the panalarm.

- Restore the main power to the pumphouse.

- Press the RST button on the Panalarm to clear the alarm.

.5 Generator Fault Alarm

This alarm is transmitted from the diesel generator control panel located in the generator room. It indicates that an alarm situation has occurred with respect to the generator.

- Acknowledge the alarm (ACK) on the alarm annunciator in the main control panel. The alarm light should turn off.

- Go to the generator control panel in the generator room and check the alarm. Look up the alarm in the generator control panel in Section 9.7. There are five possible alarms that are indicated from this panel: no speed signal, overcrank, low oil pressure, high coolant temperature, and overspeed. With the help of the generator manuals, the maintainer can try find the cause of the alarms, remedy the problems, and restart the generator. If the alarm is activated again, or the problem to the alarm cannot be found, generator/electrical servicing may be required.

- After alleviating the problem, press the RST button on the Panalarm to clear the alarm.

.6 Low Fuel Alarm

There are two (2) low fuel alarms, but only the major alarm (25% full tank) is latched to the panalarm, horn, siren, and autodialer. The major alarm activates at the low fuel point from the Magnetrol sensor. When the major alarm is activated, the panalarm, horn, siren, and autodialer are activated. The minor alarm (50% full) flashes the strobe beacon only. To alleviate the alarm condition:

- Acknowledge the alarm (ACK) on the alarm annunciator in the main control panel. The alarm light, horn, and autodialer should turn off.
- Fill the fuel tank with diesel.
- Press the RST button on the Panalarm to clear the alarm.

.7 Generator Room Low Temperature and Pump Room Low Temperature

These alarms are transmitted from the high temperature alarm thermostats. The indicate that the building temperature is higher than the set point (initially set at 32 °C). THIS ALARM MAY INDICATE A FIRE IN THE BUILDING.

Upon determining that the high building temperature alarm is on, look for signs of fire within the facility, or excess heat output. Small fires may be controlled with the fire extinguishers located at each exterior door. Larger fires will require the assistance of the Arctic Bay fire brigade.

If fire is not the cause of the high temperature alarm, then one of the following conditions may be causing the alarm:

- The high temperature alarm thermostat may be set too low.

- Acknowledge the alarm annunciator (ACK). Increase the setting to approximately 32 °C. The alarm light should turn off.

- The high temperature alarm thermostat may have failed.
  - Acknowledge the alarm annunciator (ACK). Check the thermostat for function by increasing the setting to above the room temperature. The alarm light should turn off.

- The building thermostat may be set too high.
  - Acknowledge the alarm annunciator (ACK). Reduce the setting on the building thermostat to below the high temperature alarm thermostat setting. Wait a few hours for the building to cool. The alarm light should turn off when the room temperature drops below the alarm thermostat setting.

- The temperature control thermostats may have failed and the infrared heaters are not turning off.
  - Acknowledge the alarm annunciator (ACK). Reduce the setting on the building thermostat to below room temperature, and turn the heaters' controls off. Have an electrician repair heating system if controls are not functioning properly.

- The outside temperature is very high and, therefore, the building is overheated. This would be indicated by both an outside temperature and a building temperature above the high temperature alarm thermostat setting the alarm off. Adjust the high thermostat alarm setting to a temperature higher than the room temperature.

- The ventilation system may not be operating correctly. Therefore, the generator may be overheating the generator side of the building.
  - Check the fan box, and dampers for correct operation on the

generator side of the truckfill station. The fan may have become overloaded, the actuators may not be opening the dampers, or the dampers may be sticking. If the ventilation system is suspected of malfunctioning, an electrician may be required for servicing the ventilation system.