

Signature Log

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Appendix E

Additional Survey Data

Mine Site WTP, STP, Fuel Tanks, Accomodations As Built - 20May2014.asc

0003	7913314.5482	561236.0629	197.4705	Node
0004	7913315.9883	561241.8087	197.1689	Node
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0006	7913307.9354	561253.7522	197.2193	Node
0007	7913298.2741	561260.3122	197.2223	Node
0008	7913299.6866	561265.9780	197.2017	Node
0009	7913290.4665	561272.6629	197.2487	Node
0010	7913291.5407	561278.0340	197.2109	Node
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0012	7913285.3490	561279.3400	197.2073	Node
0013	7913284.2381	561273.8692	197.1322	Node
0014	7913293.6366	561267.3279	197.1866	Node
0015	7913292.4217	561261.7592	197.1997	Node
0016	7913301.7755	561255.1095	197.2789	Node
0017	7913300.5001	561249.8482	197.2641	Node
0018	7913309.8983	561243.0652	197.2775	Node
0019	7913308.8317	561237.3829	197.2475	Node
0020	7913288.4542	561242.3161	197.3347	Node
0021	7913281.5758	561252.3583	197.4255	Node
0022	7913283.5656	561253.7275	197.3807	Node
0023	7913261.7945	561230.8499	193.4224	Node
0024	7913254.1444	561242.2046	193.3362	Node
0025	7913251.9424	561245.4643	193.3066	Node
0026	7913244.2945	561256.8196	193.2474	Node
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0030	7913224.7213	561290.3249	194.1558	Node
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0036	7913230.3976	561336.3796	195.3428	Node
0037	7913236.9618	561326.5974	195.3513	Node
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0039	7913243.9838	561316.1757	195.4045	Node
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0049	7913242.8121	561242.6768	193.3636	Node
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0053	7913251.7941	561229.0720	193.5649	Node
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0063	7913236.6372	561228.8249	192.1258	Node
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0067	7913227.6313	561242.4257	192.1545	Node

Mine Site WTP, STP, Fuel Tanks, Accomodations As Built - 20May2014.asc

0068	7913225.4777	561245.6799	192.1314	Node
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0080	7913302.0970	561361.7382	200.9393	Node
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0087	7913390.7921	561304.8952	201.9749	Node
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0122	7913381.3815	561432.3892	201.3069	Node
0124	7913375.2978	561478.9704	203.0386	Node
0125	7913368.7404	561479.4418	203.0888	Node
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0137	7913310.2067	561388.0467	200.8782	Node
0138	7913310.5647	561392.7221	200.9332	Node
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Mine Site WTP, STP, Fuel Tanks, Accomodations As Built - 20May2014.asc

0141	7913298.1458	561388.9610	200.7204	Node
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0145	7913297.0306	561380.8470	200.5989	Node
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0167	7913423.2063	561444.7341	200.7004	Node
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0170	7913404.3484	561445.4416	200.2467	Node
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0173	7913342.8819	561398.6849	200.0828	Node
0174	7913342.6205	561394.9846	200.0480	Node
0175	7913343.7528	561394.8900	200.0895	Node
0176	7913323.3765	561360.3509	199.7963	Node
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0181	7913350.2573	561347.6172	200.1460	Node

Appendix F

Tanks and Pipes

Note the page count for each document below. These reports will be provided upon request.

- A. E349000-TM001-00-118-0001-001 thru -009 DATA BOOK 4613-TK-001 500,000 LITRE ARTIC DIESEL TANK MINE SITE **[739 page]**
- B. E349000-TM001-00-118-0002-001 thru -009 DATA BOOK 4613-TK-002 500,000 LITRE ARTIC DIESEL TANK MINE SITE **[717 page]**
- C. E349000-TM001-00-118-0003-001 thru -009 DATA BOOK 4613-TK-003 500,000 LITRE ARTIC DIESEL TANK MINE SITE **[736 page]**
- D. E349000-TM001-00-118-0004-001 thru -009 DATA BOOK 4613-TK-004 500,000 LITRE ARTIC DIESEL TANK MINE SITE **[735 page]**
- E. E349000-TM001-00-118-0010-001 thru -009 PIPE FABRICATION TURNOVER PACKAGE **[994 page]**

The above tank data books include the following sections as submitted by Groupe Laframboise Ltee:

- Section 1: Inspection Test Plan
- Section 2: Procedures
- Section 3: Non-Destructive Examination Reports
- Section 4: Welding Data
- Section 5: Engineering
- Section 6: Tank Calibration & Strapping
- Section 7: Material Data
- Section 8: None-Conformity Report

The above pipe fabrication turnover packages include the following sections as submitted by Groupe Laframboise Ltee:

- Section 1: Inspection Test Plan
- Section 2: Procedures
- Section 3: Welder Qualifications
- Section 4: Welding Consumables
- Section 5: Material Test Reports
- Section 6: Non-Destructive Examination
- Section 7: Hydro/Pneumatic Testing
- Section 8: As Built/ Mapped Drawing

Appendix G

Fuel Dispensing Modules

- A. E349000-PM004-02-118-0001Sub01 Mine Site Diesel [Dispensing Module] Operations Manual **[46 pages]**
- B. E349000-PM004-02-118-0002Sub01 [Fuel Dispensing Module] Fire Suppression System Operations and Maintenance Manual **[158 pages]**
- C. E349000-PM004-50-117-0005Sub01 Mine Site Diesel Fuel Module Inspection Plan **[5 pages]**
- D. E349000-PM004-50-117-0006Sub01 Mine Site Diesel Fuel Module Test Plan **[3 pages]**
- E. E349000-PM004-50-042-0013Sub03 Mine Site Diesel Fuel Isometric, Assembly, Floor Plan As Built **[3 pages]**
- F. E349000-PM004-70-042-0006Sub02 Mine Site Diesel Fuel General Arrangement Electrical As Built **[1 page]**
- G. E349000-PM004-70-082-0003Sub02 Mine Site Diesel Fuel Module One Line Diagram As Built **[1 page]**
- H. E349000-PM004-70-083-0006Sub02 Mine Site Diesel Fuel Module Three Line Diagram As Built **[1 page]**

**HATCH****VENDOR DATA REVIEW**

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Date Received	06/04/2014		
Review Grade		Next Submittal Status	
☐ C1 – Proceed to next submission & status		☐ Internal Review	
☐ C2 – Proceed with exceptions as noted to next submission & status		☐ Certified Final	
☐ C3 – Do not proceed, revise as noted & resubmit		☐ Final	
		☐ As-Built	
		Next Submittal Date:	
No further submission required - Complete		☒	
☒ C4 - No further submission required - Cancelled		☐	
No further submission required - Superseded		☐	
Package Coordinator: Name, signature and Date: KEN IMAI, Ken Imai, 23/09/2014			
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Mine Site Diesel Operations MANUAL

2014 VERSION A

MINE SITE DIESEL OPERATIONS MANUAL - Version A

Issue Date: January 2014

PLEASE READ BEFORE USING.

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We Engineer Solutions

2014 Mine Site Diesel Operations Manual (Version A)

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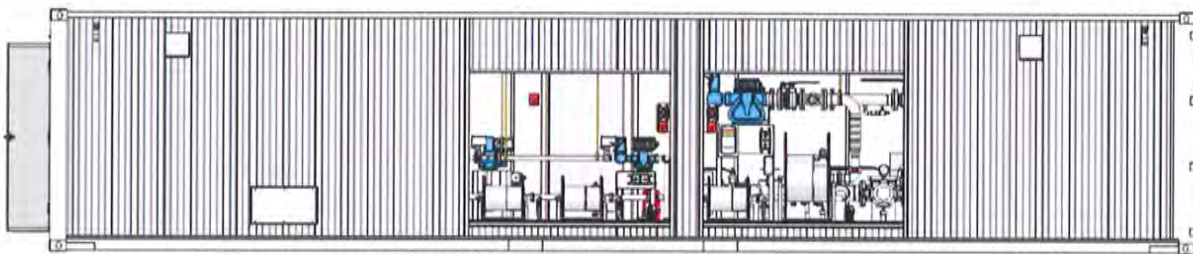
Section 1: Introduction

Mine Site Diesel Dispensing System

Overview

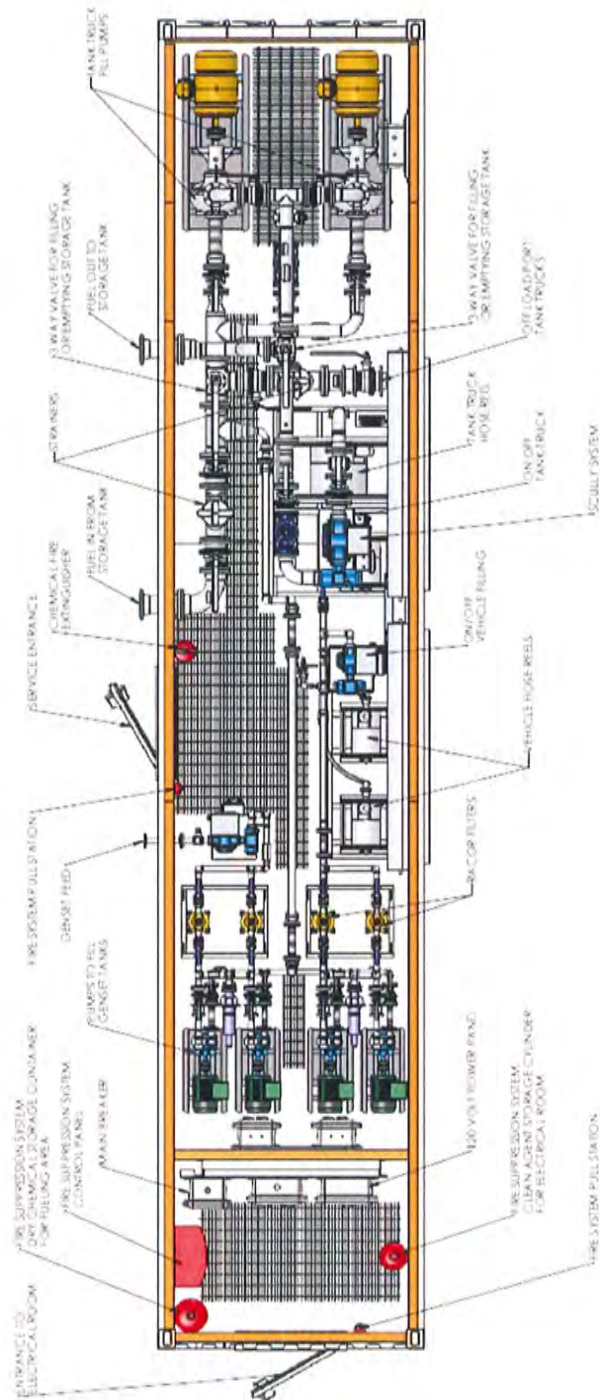
SEI Industries has provided three modules to Baffinland Iron Mines — one diesel and one Jet A system at Milne Port and a diesel system at the Mine Site. An operations manual has been supplied for each module as well as a separate maintenance manual. The maintenance manual provides details on all of the components used to create the systems as well as parts lists.

This specific manual is the operations manual for Mine Site Diesel. It includes instructions on the operation, lubrication and inspection of the diesel dispensing fueling module. A list of all fueling module components is also included. A layout of this module, identifying all the major components, can be found on the inside of the module near the side man-door and on page 2 of this manual.



Mine Site Diesel Dispensing System

Mine Site Diesel Layout



Section 2: Safety

General Safety Procedures

Ensure work site safety by observing the following suggestions:

- Ensure you are aware of all safety and emergency information in this manual and all safety and emergency procedures regulations, procedures and guidelines provided at the work site.
- Obey "no smoking" signs.
- Familiarize yourself with the emergency stop switch locations.
- Ensure that an appropriate communications structure is in place before deployment to minimize confusion in an emergency.
- Anticipate emergencies before they happen and prepare a mini-response plan.
- Know the exact location of all fire extinguishers available at the site and how to summon emergency fire and medical assistance.
- Keep this manual and all enclosed manufacturer documentation readily available at the site for reference.

Caution

Do not operate any part of the system unless you have received training deemed appropriate by both SEI Industries and your employer. In particular, you must fully understand all general safety precautions with respect to refueling operations and the handling of flammable materials.

Pump Safety Procedures

Fire Procedure

If a fire occurs:

1. Press an emergency stop switch, cutting all power in the unit.
2. If the automatic fire suppression system (which has a battery backup allowing it to operate when the power supply is cut), fails to activate then a manual fire alarm must be pulled. To activate, lift the alarm door and pull the ring down. One alarm is located on the outside of the container. The other alarm stations are inside the module; one just inside the service entrance and the other just inside the electrical room door (see layout on page 2).
3. If needed, a manual fire extinguisher can be found just inside the service entrance door. Refer to the layout found in this manual if you are unfamiliar with the system.
4. Any vehicle or tanker truck should be removed from the immediate area.
5. Ensure that assistance has been requested from the site supervisor and/or the local fire emergency team.



To activate, lift the alarm station door and pull the ring down.

Fuel Fire Emergencies

Warning

In the event of a fuel fire or spill, immediately stop all fill/discharge operations. Immediately press an emergency stop switch.

Warning

If a fuel spill from the fuel system occurs, as the result of mishandling of the equipment or a component failure, then it is likely that, without emergency assistance, you do not have the resources necessary to contain the spill. If the spilled fuel from the fueling system ignites, then clear the area immediately as you do not have the resources to control such a fire alone.

Baffinland Iron Mines is responsible for creating a training program that guides the user through adequate safety procedures in the event of a fuel fire.

The following items are essential elements of such procedures:

1. IMMEDIATELY STOP ALL FILL/DISCHARGE OPERATIONS.
2. Locate a fire extinguisher and extinguish any fires outside the fueling modules.
3. Clear the area of all non-essential personnel and request emergency response teams.
4. If possible, use the valves feeding the fuel system to shut off the flow, both upstream and downstream of the fire zone.
5. Await emergency response teams.

Warning

If an emergency stop switch has been pressed, it will stop all systems using electricity. If the system will not start up again, check all emergency stop switches and pull out the switch that was activated.

Fuel Spill Emergencies**Warning**

In the event of a fuel fire or spill, immediately stop all fill/discharge operations. Immediately press an emergency stop switch.

Warning

If a fuel spill from the fuel system occurs, as the result of mishandling of the equipment or a component failure, then it is likely that, without emergency assistance, you do not have the resources necessary to contain the spill. If the spilled fuel from the fueling system ignites, then clear the area immediately as you do not have the resources to control such a fire alone.

Baffinland Iron Mines is responsible for creating a training program that guides the user through adequate safety and clean-up procedures in the event of a fuel spill.

The following items are essential elements of such procedures:

1. IMMEDIATELY STOP ALL FILL/DISCHARGE OPERATIONS. IMMEDIATELY PRESS AN EMERGENCY STOP SWITCH.
2. SHUT DOWN OR REMOVE all potential ignition sources near the fuel spill and locate a fire extinguisher.
3. Clear the area of all non-essential personnel and request emergency response teams.
4. If ignition of the fuel spill is imminent, or if fuel vapour makes respiration difficult, evacuate every person from the area and await emergency response teams.
5. If possible, identify the source of the leak.
6. IMMEDIATELY SHUT OFF THE VALVE SUPPLYING THE REFUELING SYSTEM MODULE WITH FUEL.
7. If possible, use the ball valves inside the fuel system to shut off the flow both upstream and downstream of the fire zone.
8. Await emergency response teams.
9. Prepare for clean-up operations.

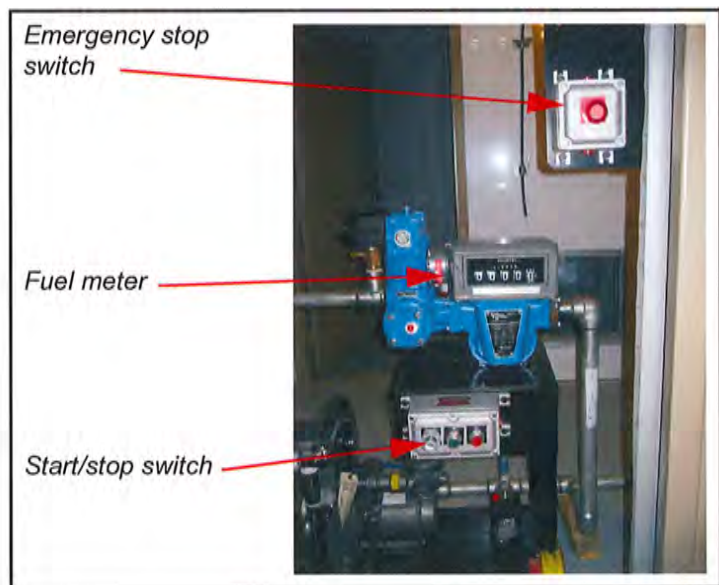
Section 3: Quick Start Guides

Warning

Quick start guides should only be used once you are trained and completely familiar with operational procedures. Please refer to *Section 4* of this manual.

Vehicle Refueling Checklist

1. Check the electrical room to make sure all breakers are on.
2. Turn on lights, if not already on.
3. If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
4. Zero fuel meter.
5. Pull out hose reel.
6. Start pump.
7. When full, turn off pump.
8. Retract the hose reel by pushing the rewind button and holding the button until rewind.
9. Zero fuel meter.



Tanker Truck Filling Checklist

1. Check the electrical room to make sure all breakers are on.
2. Turn on lights, if not already on.
3. If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
4. Plug in Scully control system cord. If tanker truck not equipped with Scully system, deactivate system with key and attach grounding reel.
5. Zero fuel meter.
6. Release hose reel clutch by pulling black knob out.

Tanker truck fuel meter



Warning

Filling Empty Tanks

The API RP 2003 recommends limiting the initial velocity to 1m/s (500 LPM) until the tanker truck inlet is submerged by two inlet pipe diameters. After that, the flow can increase up to 3m/s (1500 LPM). A gate valve on the truck will control the flow or the ball valve near the hose reel can be also used.

7. Before starting pump, ensure that the two 3-way valves are set to "loading to hose reel." Start pump.
8. When full, turn off pump.
9. Engage hose reel clutch by pushing black knob in.
10. Retract the hose reel by pushing the rewind button and holding the button until rewound.
11. Zero fuel meter.

Genset Refueling Checklist

1. Check the electrical room to make sure all breakers are on.
2. Turn on lights, if not already on.
3. If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
4. Zero fuel meter.
5. Determine how to stop the fuel flow before the Genset tank overflows.
6. Start pump.
7. When full, turn off pump.
8. Zero fuel meter.



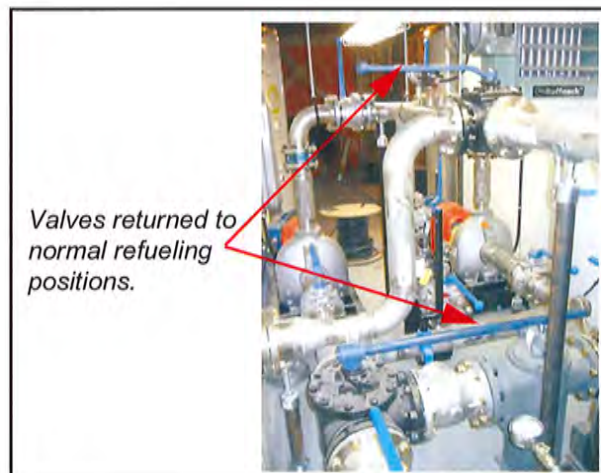
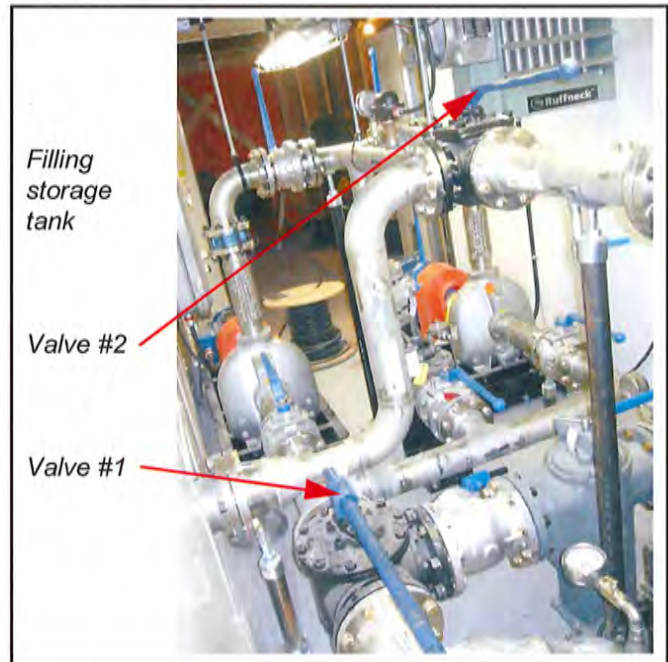
Warning

Filling the Genset

At the time of installation, the Genset system is provided with only manual control. There are two ways to control filling. The first way is to determine how much fuel is required to fill the Genset tank and then use the flow meter reading to gauge when to shut the fuel flow off. The other option is to have a second person, who monitors the level in the tank and is in communication to advise the person running the pump, to shut off the flow before it overflows.

Tanker Truck Off-Loading Checklist

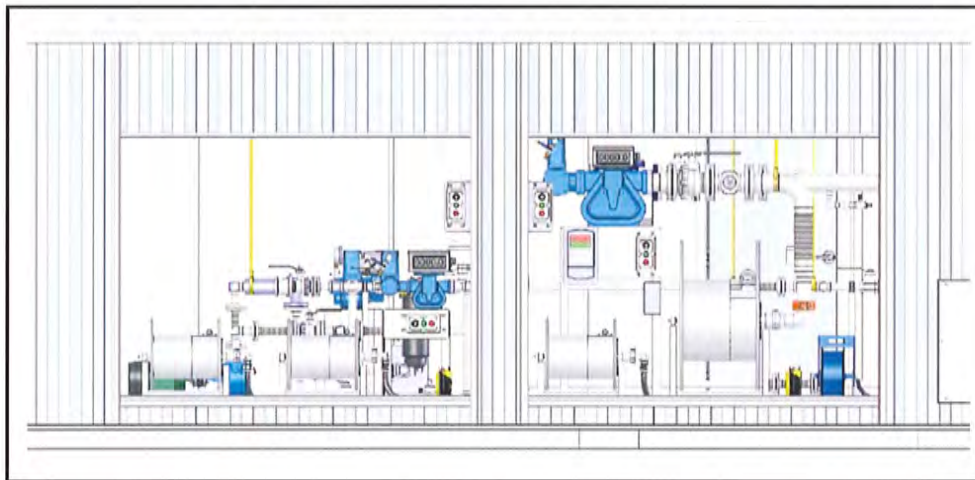
1. Open the right-hand fueling door.
2. Attach the ground cable from the grounding reel to the tanker truck.
3. Attach the tanker truck off-loading hose to the off-load port.
4. Turn the 6" three-way valve #1 to "off-load to tank."
5. Turn the 4" three-way valve #2 to "off-load to tank."
6. Open the valve at the off-load port.
7. Start pumps in fueling module.
8. When the tanker truck is empty, turn off the pumps.
9. Close the valve at the off-load port.
10. Open both three-way valves back to the "loading to hose reel" position.



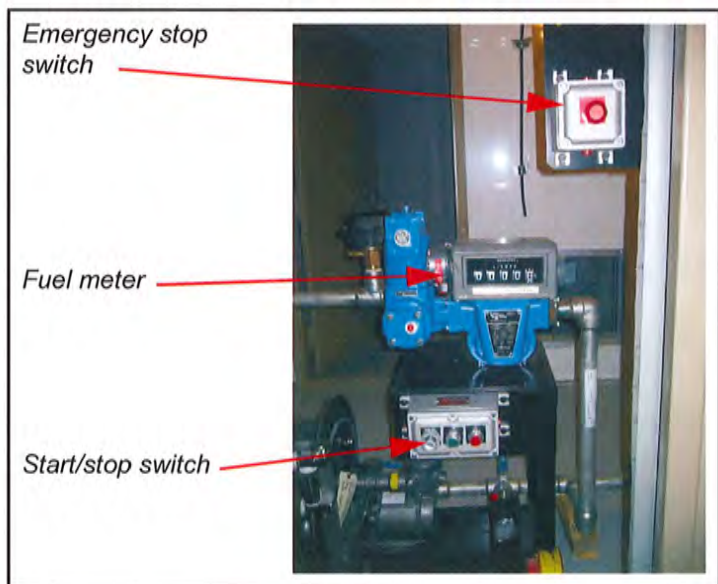
Section 4: Operations

Vehicle Refueling Procedures

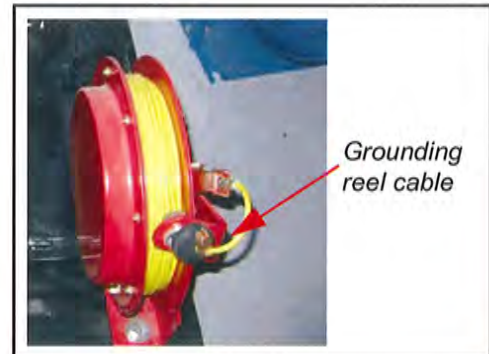
1. Locate the refueling side of the container.
2. Open the left-hand refueling door.



3. Locate the emergency stop switch, meter and start/stop switches.
4. Reset the fuel meter to zero, if required.



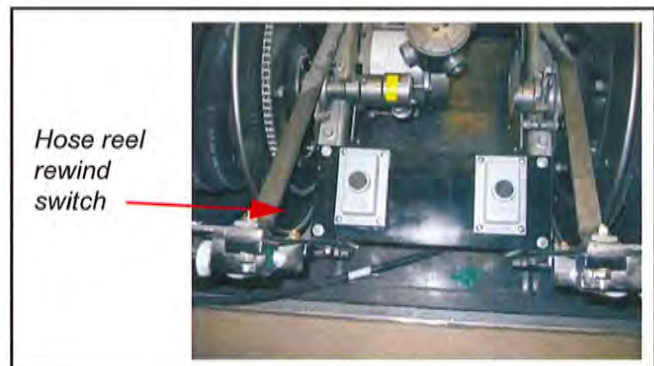
5. Pull out grounding reel cable and connect clamp to the truck where the grounding will take place.
6. The hose reel on the right hand side should be used first. If this hose reel is being serviced or is inoperable, use the hose reel on the left and the same meter. A final hose reel can be found behind the right-hand refueling door but the meter for this hose reel is located behind the left-hand door.



7. The hose reel rolls out manually only. Power is for rewind only. Tension can be changed by adjusting the tension wing nut.
8. Start pump.



9. The nozzle will shut off when vehicle has been filled. Once it stops, turn off the pump. Carry the nozzle back to the hose reel to keep it clean. Activate the button to retract the hose and hold it until the hose is retracted enough to allow you to place the nozzle in its holder.



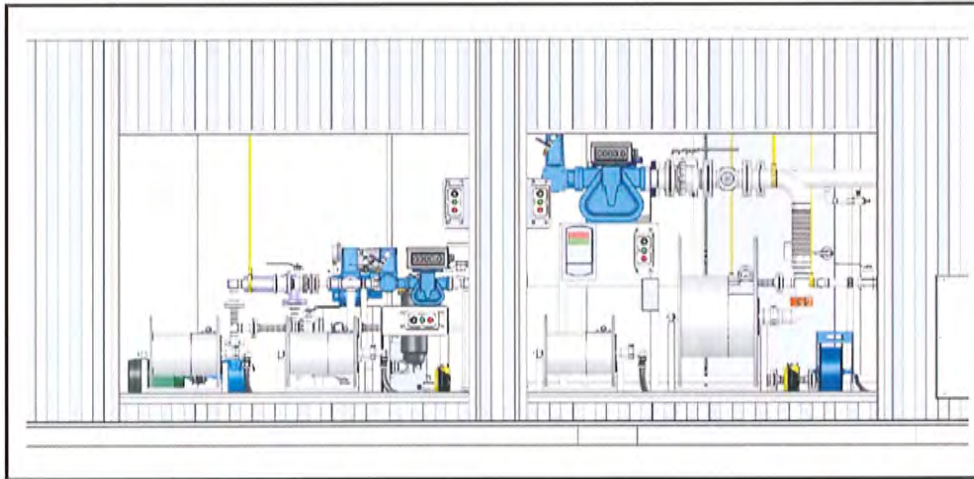
10. Reset the meter to zero.
11. Close the refueling door.

Important Note

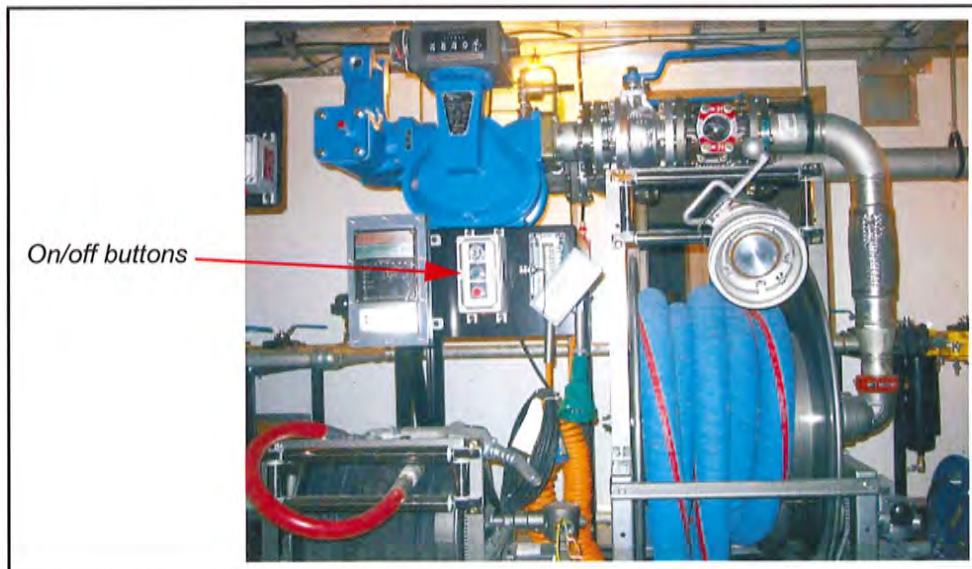
If no fuel is dispensed for a period of five minutes, the dispensing pump will shut down. To reactivate the pump, press the pumping start button again.

Tanker Truck Filling

1. Locate the refueling side of the container.
2. Open the right-hand refueling door and locate emergency stop switch.



3. The large hose reel with a 3" hose and a bottom loading coupler is for filling tankers.

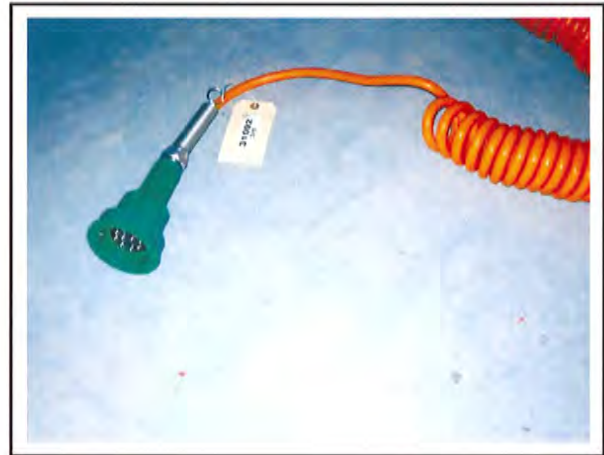


4. Reset fuel meter to zero, if required, and check the two 3-way valves are set to "loading to hose reel" position.

Tanker truck fuel meter



5. Connect the Scully system cord to the tanker truck.



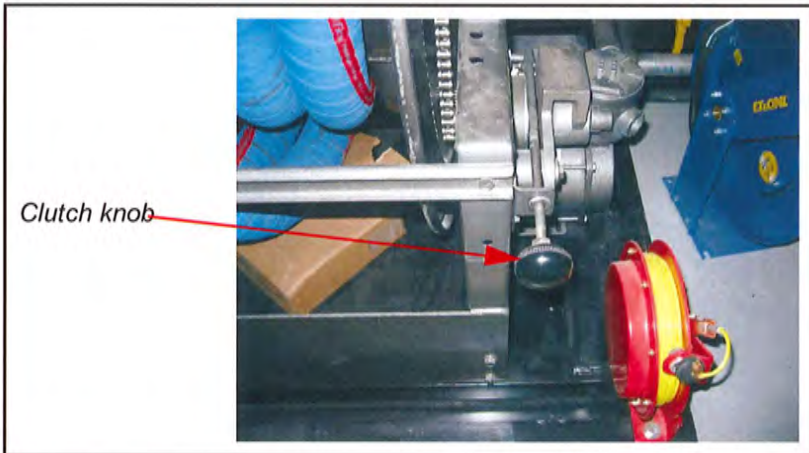
6. If the truck is not equipped with a receptacle for the Scully cord, please refer to the bypass authorization instructions at the end of these steps.

- USE TESTER OR SENSOR DUMMY

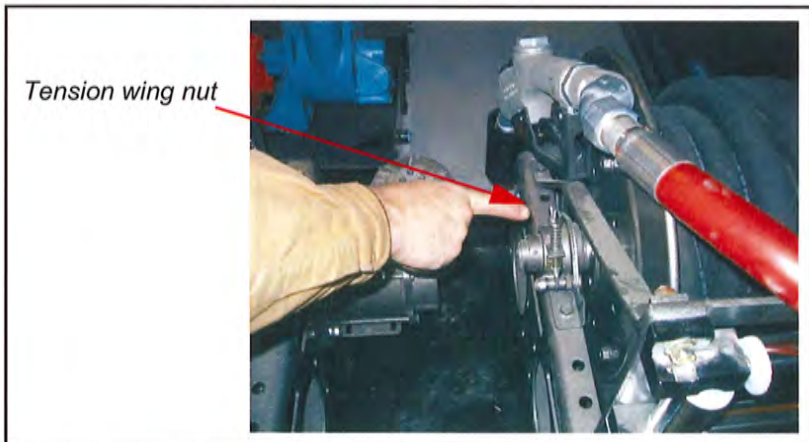
7. A green light should appear on the Scully panel.



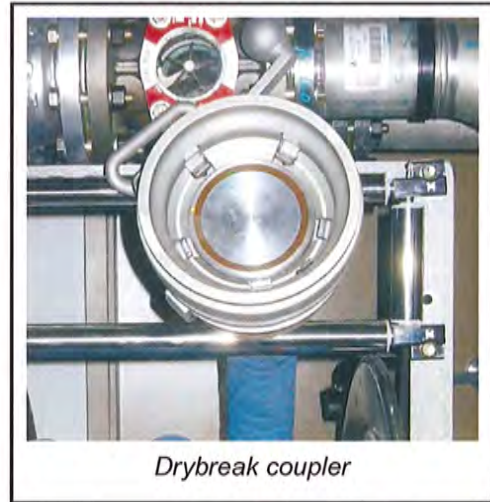
8. To manually unwind the hose reel, pull the large black knob out to release the clutch.



9. Pull the supply hose out, carrying the dry break to keep it clean. Tension can be changed by adjusting the wing nut.



10. Connect the bottom loading coupler to the tanker truck. Ensure that both three-way valves are in the "loading" position.



11. The system's deadman switch must be held in the "on" position to activate the flow.

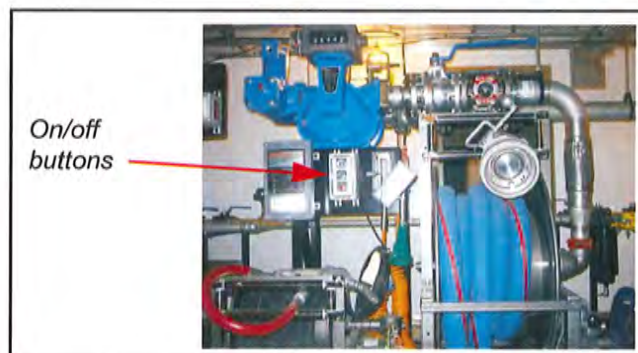


Warning

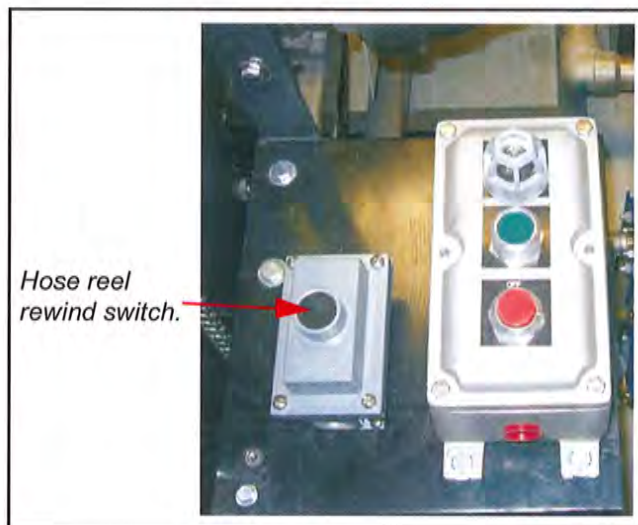
Filling Empty Tanks

The API RP 2003 recommends limiting the initial velocity to 1m/s (500 LPM) until the tanker truck inlet is submerged by two inlet pipe diameters. After that, the flow can increase up to 3m/s (1500 LPM). A gate valve on the truck will control the flow or the ball valve near the hose reel can be also used.

12. Start pump.



13. When the tanker truck has been filled or the Scully System has shut off the flow, turn off pump. Next, disconnect the dry break coupler from the tanker truck and push in the black knob on the hose reel. Activate the push button to rewind the hose, carrying the dry break back to the hose reel to keep it clean. The mount on top of the hose reel will hold the coupler in place. The rewind motor will continue to run while the button is being pushed.



14. Reset the meter to zero.
15. Disconnect the Scully system and place its cord back into the system module.
16. Close the refueling door.

Important Note

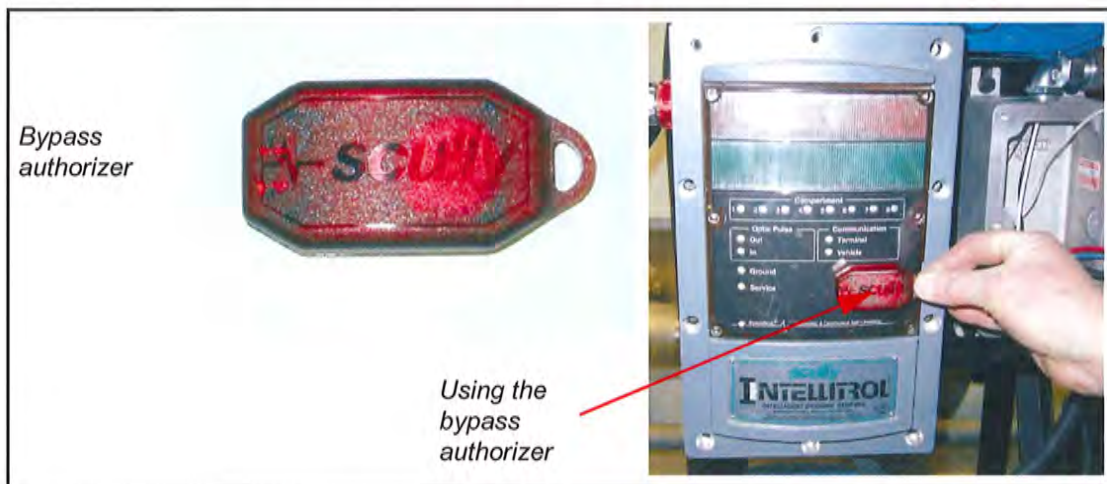
If no fuel is dispensed for a period of five minutes, the dispensing pump will shut down. To reactivate the pump, press the pumping start button again.

Scully Bypass Authorization Instructions

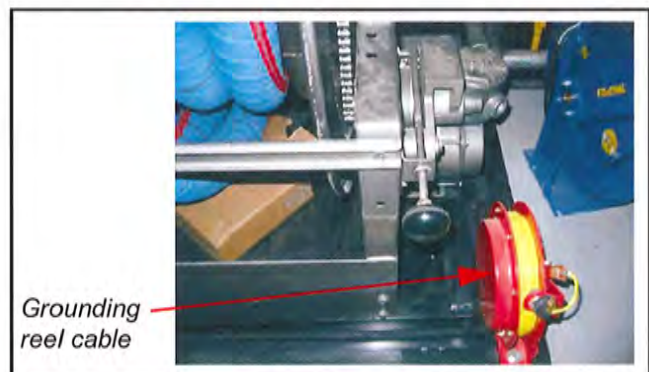
If the Scully system is not operational or if the tanker truck system is not working, the system can be bypassed.

1. Locate the bypass authorizer.
2. Place bypass authorizer with Scully logo facing out.
3. After 10 seconds, the Scully system will accept the bypass request

OR USE MANUAL SOLENOID VALVE
OVERRIDE (BRASS SCREW)
ON CONTROL VALVE



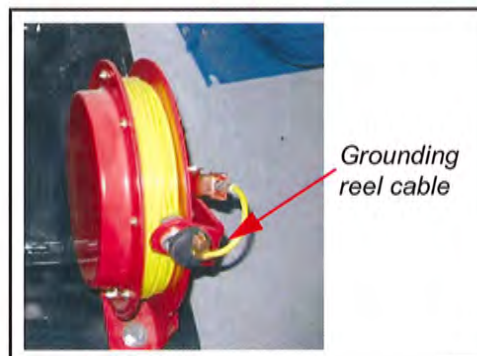
4. Attach the grounding reel clip to tank truck.
5. Keep in mind that the load sensors will not be functioning properly.
6. Connect dry break coupler and start pump, then activate deadman switch.
7. To eliminate overfilling of the tanker, monitor the level in tank with a dipstick or visually check the level.
8. Stop pumping before the tanker is overfilled by releasing the deadman switch.



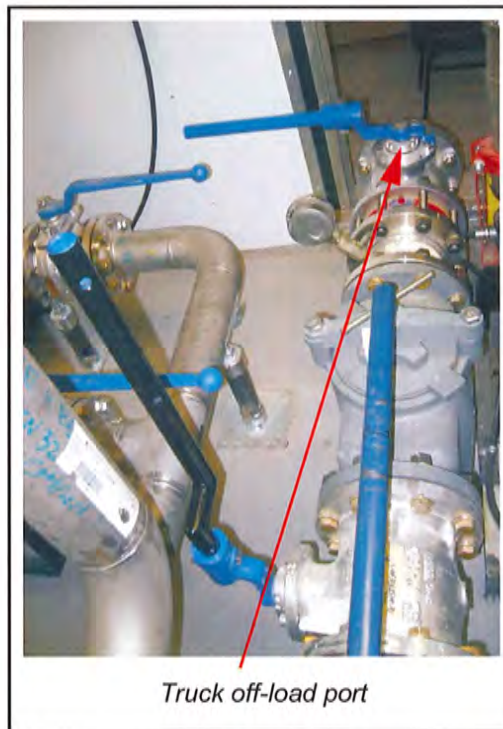
All other tanker filling operations remain the same.

Tanker Truck Off-Loading

1. Open the right-hand fueling door.
2. Attach the ground cable from the grounding reel to the tanker truck.

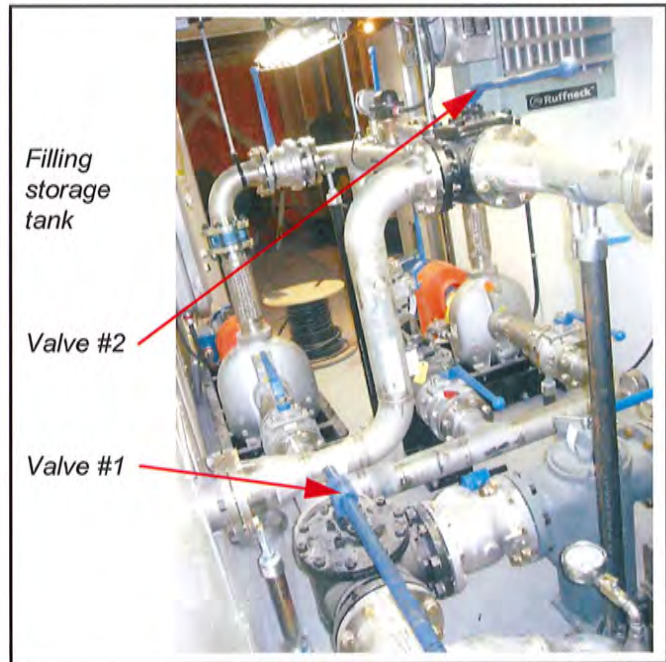


3. Attach the tanker truck off-loading hose to the off-load port.



4. Turn the 6" three-way valve #1 to "off-load to tank."

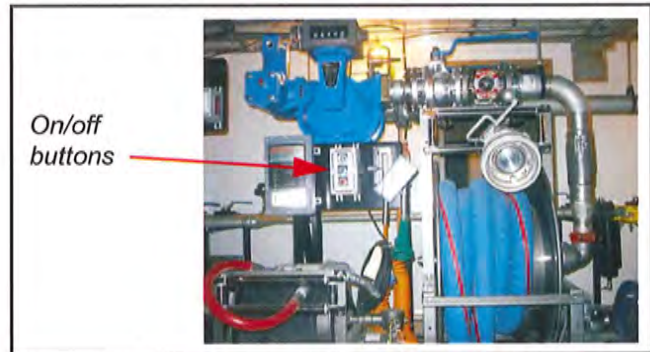
5. Turn the 4" three-way valve #2 to "off-load to tank."



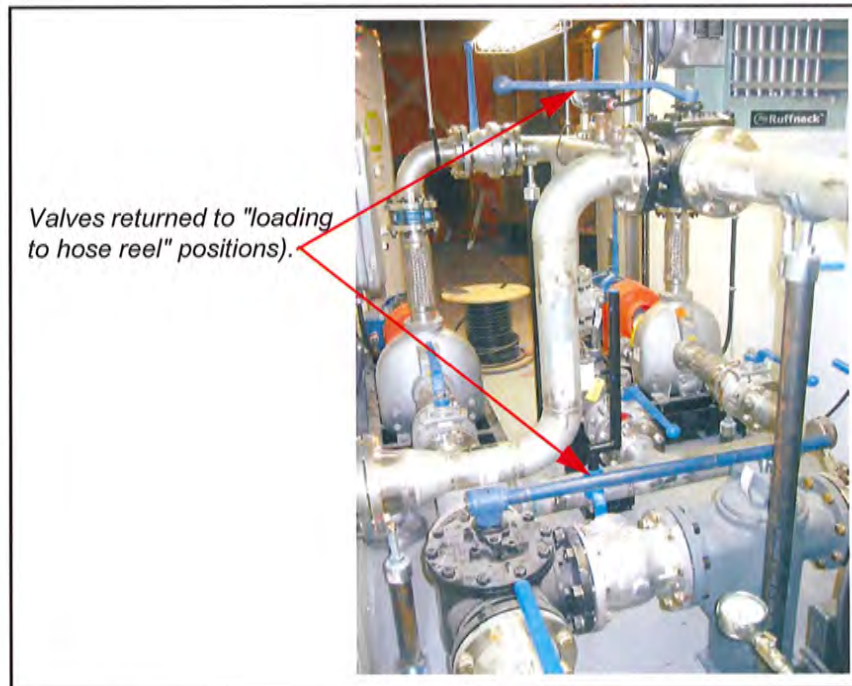
6. Open the valve at the off-load port.



7. Start pumps in fueling module.



8. When the tanker truck is empty, turn off the pumps.
9. Close the valve at the off-load port.
10. Open both three-way valves back to the "loading to hose reel" position.



Genset Refueling

The Genset system runs independent to all other systems. The control center is located to the right of the service entrance door.

The control system consists of an on/off switch, fuel meter and emergency stop switch.

At the time of installation, the Genset system is provided with only manual control. There are two ways to control filling.

The first way is to determine how much fuel is required to fill the Genset tank and then use the flow meter reading to gauge when to shut the fuel flow off.

The other option is to have a second person, who monitors the level in the tank and is in communication to advise the person running the pump, to shut off the flow before it overflows.



Air Heating Systems

Caution

The electrical room must never be allowed to freeze as this may cause the fire suppression system to fail.

The fueling modules contain heaters designed for hazardous locations. Each module has two heaters. The electrical room has a 120 volt heater (part number 010075, model XB2-4200T2D11T). The refueling area has a 600 volt heater (part number 010095, model FX5-SD-600360-200T). All heaters are controlled by a thermostat which is set at the time the units are commissioned. To change the temperature, adjust the thermostat.



Fueling area heater



Fueling area thermostat



Electrical room heaters

The Mine Site maintenance manual provides comprehensive information and instructions for each unit covering maintenance, troubleshooting, service and parts lists.

Fire Suppression System

The fire suppression system is made up of two sections — one in the electrical room and the other in the fuel dispensing area. Fire suppression chemical is stored in the electrical room.

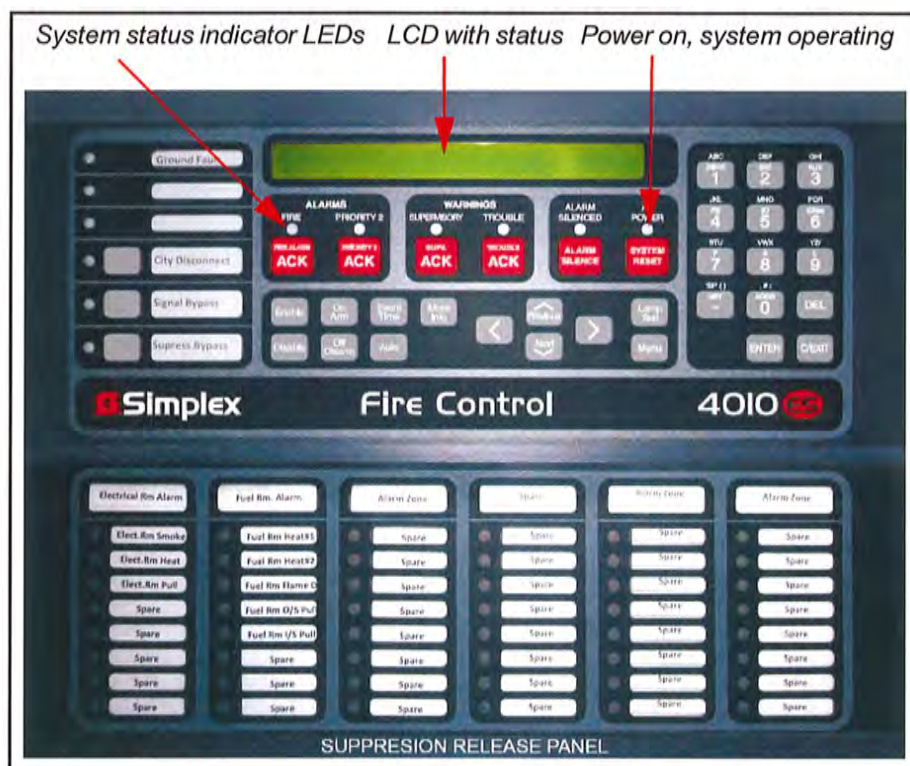
The system is triggered by smoke, heat, flame detectors or by manual pull stations located by the two service doors or between the fueling doors.

The system should be serviced annually and verification should be conducted by a qualified technician.

For service technician use only.



Fire Status Conditions



Normal Condition: Green power LED is on, indicating the panel is receiving AC power. All other LEDs off, display reports system is normal.

Alarm Condition: Red LED labelled FIRE ALARM flashes. Tone alert (buzzer) on panel sounds. The alarm strobe mounted on the outside of the unit will flash as well. The display reports FIRE.

Acknowledging an Alarm: Press the FIRE ALARM ACK button on the keypad. The red LED should change from flashing to steady on.

Silencing the Alarm: Press the ALARM SILENCE ACK button on keypad. The alarm silenced LED should turn on and the display will show ALARM SILENCE IN PROGRESS.

Resetting the System: Press the SYSTEM RESET button on the keypad. The display will show SYSTEM RESET IN PROGRESS. If all devices reset, the alarm LEDs will flash. Press the FIRE ALARM ACK or the PRIORITY 2 ACK button, or both, on the keypad and display should show SYSTEM IS NORMAL.

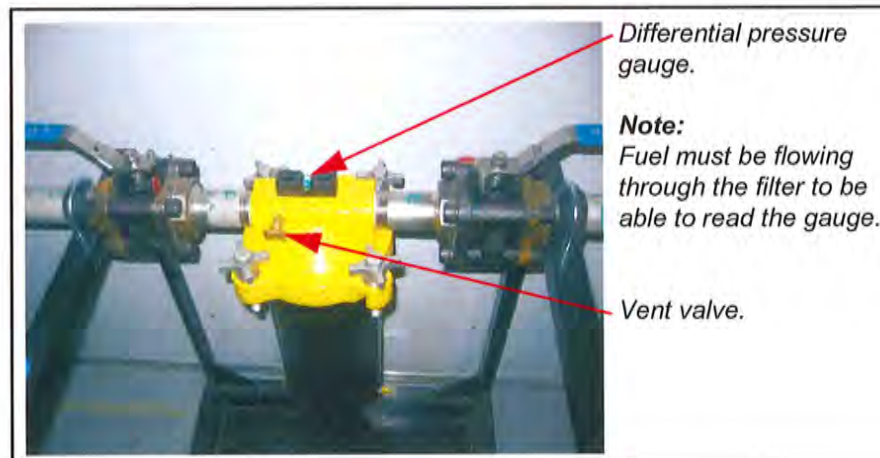
If the device remains in alarm and fails to reset, the display will show ALARM PRESET, SYSTEMS RESET ABORTED. This will require resetting the individual pull station or sensor, disabling the device or a hardware reset.

Trouble Conditions: The yellow LED labelled TROUBLE flashes, the tone will sound and the display will show TROUBLE. To acknowledge the trouble, press the TROUBLE ACK button located just below the Trouble LED. The device identified on the display must be checked and/or serviced.

Supervisory Conditions: The yellow LED labelled SUPERVISORY flashes, the tone will sound and the display will show SUPERVISORY. To acknowledge the trouble, press the SUPV ACK button located just below the LED. Read the display and investigate the problem to determine the cause.

Filtration Vehicle Fuel Dispensing

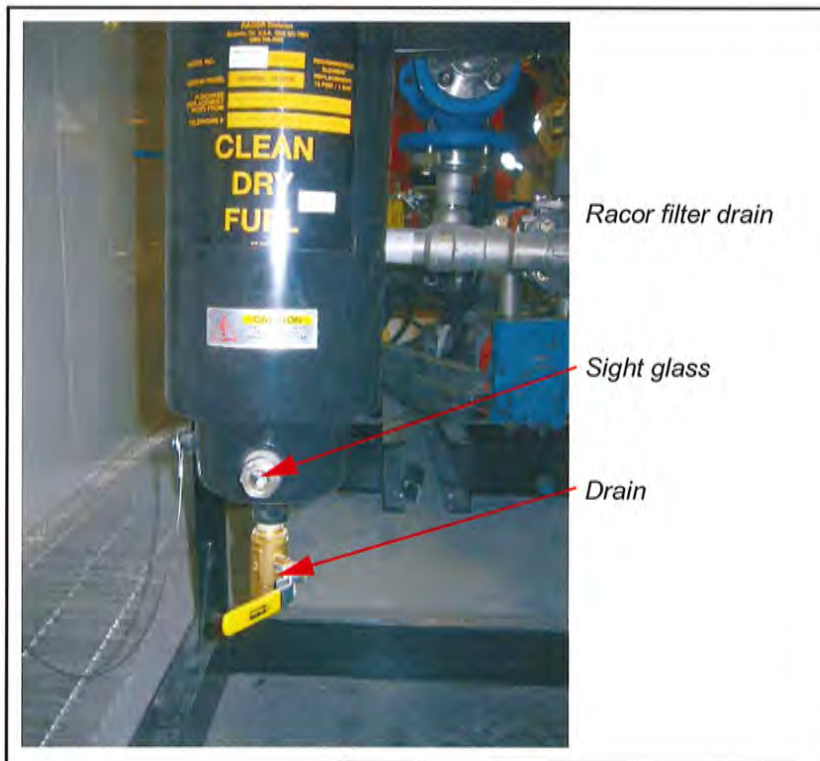
The filter assemblies are designed to meet the toughest hydrocarbon refueling conditions and provide for easy filter change outs. The FBO assembly can flow 100 LPM. The unit can be used for diesel fuel dispensing pumps or as a primary fuel filter/water separator for large dispensing modules. The assembly features a locking ring collar which attaches the filter housing to the aluminium die-cast filter head with four bolts.



The slotted locking ring collar allows maintenance personnel to hand-loosen the four collar bolts, rotate and lower the bowl assembly for element change outs. Refer to the maintenance manual for further information.

As the system is dispensing fuel, check to see if the differential pressure gauge is in the green. If it's in the red, it means that the filter cartridge needs to be changed. You should be able to determine what filter is being used by checking which pump is running or by liquid movement in the sight glass. Refer to the maintenance department to change the cartridge.

While the unit is still warm, the fuel filters should be drained daily of any water that has accumulated in the filter housings. Check the sight glass for accumulated water, if present. Open the drain valves on the bottom of the housings and vent valve, draining any water into a container until you see clear fuel flowing through.



Vehicle Refilling Automatic Shut-Off Nozzles

This nozzle (part number 006507, model 7H) works the same way as any typical gas station nozzle used to fill cars.

- UL and ULC listed for use in gasoline, diesel and up to 10 per cent ethanol blends.
- Prevents fuel spills utilizing a unique "No Pressure, No Flow" device.
- The nozzle cannot be opened until the pumping system is pressurized and closes automatically when the pressure is removed.
- Prevents user from jamming the nozzle in an open position (blocker on lever guard).
- FlowLock allows the nozzle to shut-off when falling out of a fill pipe and tipped up, limiting spillage and unsafe conditions.
- Low reliable shut-off specifically designed to ensure proper automatic shut-off as low as five gallons per minute.



See the maintenance manual for parts and service information.

Bottom Loading Coupler

The bottom loading coupler is used along with the Scully system to prevent over filling. It connects to a standard API bottom loading adapter. Dual interlocks ensure that the bottom loading coupler cannot be opened unless it is properly connected to an API adaptor.



Scully System

Scully's electronic tanker truck system provides self-checking overfill protection as well as grounding verification for tanker trucks that carry/haul petroleum products.



The Scully IntelliCheck on-board provides overfill prevention and a "retained product" monitoring system. Once its plugged into the receptacle on the tanker truck and a green light has come on, the system will sense the level of fuel in the tanker and shut fuel flow off before the tank overflows.



It works in combination with the system's deadman switch which must be held in the "on" position to activate the flow. See *Tanker Truck Filling* in this manual for details on how to hook up and activate the system.



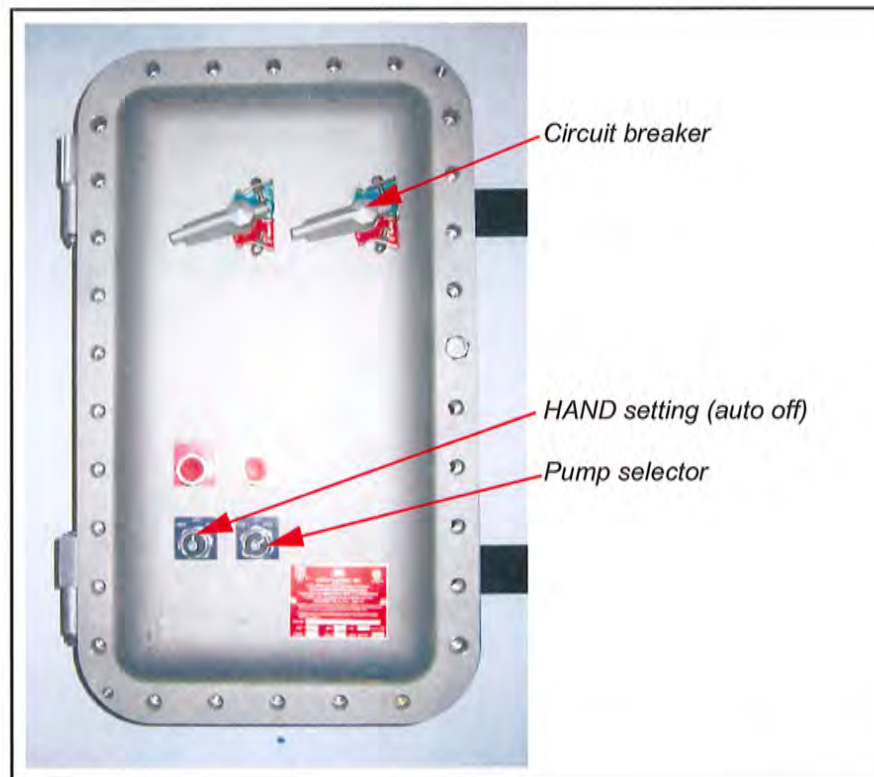
Deadman connector and switch.

Pumps

The system includes two 1500 litre pumps and four 100 litre pumps.

Tanker Truck Refueling Pumps

The 1500 LPM pumps are used to fill or off-load the tanker trucks. Only one pump runs at a time. Each time you start the system, it will start the opposite pump to the one that was used the last time. If a pump has to be serviced, it can be taken off line by using the switch box (shown below).



To eliminate one pump, turn the left knob to HAND and switch the right knob to number 1 or 2. Start the pump to make sure you've selected the pump you want to keep on line. If it isn't correct, stop the pump and switch to the opposite pump number.

Use the circuit breaker handles to lock out the pump prior to servicing.

Pump Bearing Housing

If the pump oil level is low and oil has to be added, use SAE 30 non-detergent oil. Shut the pump down, remove the filler plug, then add oil until the sight gauge shows the correct level. **DO NOT OVERFILL.** Replace the filler plug and turn the left control panel switch back to AUTO.

Pump Priming

In most cases, the pumps should never have to be primed as the system should be normally flooded. However, if the fuel level is low in the main storage tanks, priming may be necessary if a pump has never been on line or if it has been off line for service. Before priming, make sure all inline valves are open.



If, upon start-up, the pump failed to pump fuel using the control panel, shut the pump down and close the inflow valve (this eliminates flow causing a spill). Remove the priming plug, add fuel to the housing until full, re-install the plug and bring the pump back on line. If it still does not pump, repeat the priming operation. If it still fails to pump, refer to the maintenance manual to service the pump.

Vehicle and Genset Refueling Pumps

There are four 100 LPM pumps (two for vehicle refueling and two for Genset refueling). These pumps run in the same way as the 1500 LPM pumps, switching from one pump to the other as they are started. The control of the pumps is also the same with a control panel similar to the larger pump systems.

The two vehicle pumps feed the fuel to three hose reels used to dispense fuel to motor vehicles. The two Genset pumps feed through a flow meter directly to the outlet. Priming of these pumps should not be necessary due to the design of the pumps.

Strainers

Every month, the strainers should be inspected. There is a gauge on each side of the strainer and, if a difference of 5 PSI between the gauges shows, then the filter basket has to be cleaned.

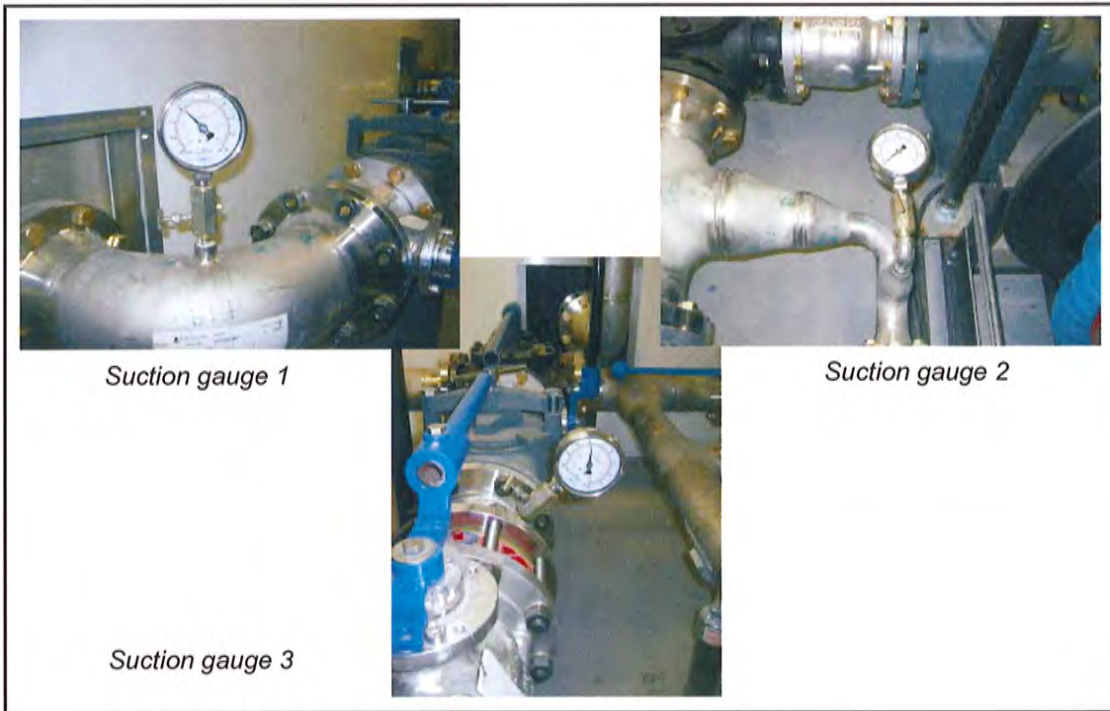


To do this, close the isolation valves attached to the strainer and open the bottom drain. When some fuel has drained, open the top assembly to eliminate any vacuum build up.

When the fuel has completely drained, pull the basket out, clean it using some fuel and return it to the strainer.

Close the drain, open the isolation valves again and the system is now ready to return to service.

Strainer Gauges



Suction gauge 1

Suction gauge 2

Suction gauge 3

Section 5: Specifications

Fuel Module Specifications

Container Specifications

Length: 40'

Width: 8'

Height: 8'

PSD-990 Genset Fueling System (two assemblies)

- 100 LPM Pump 1-1/2" Inlet
- Electric Motor 1-1/2 HP 600V 3PH
- Pump Base 100 LPM
- Filter Housing FBO-14 DPL
- Filter Base 100 LPM

PSD-990A Vehicle Fueling System (two pump and filter assemblies)

- 100 LPM Pump 1-1/2" Inlet
- Electric Motor 1-1/2 HP 600V 3PH
- Pump Base 100 LPM
- Filter Housing FBO-14 DPL
- Filter Base 100 LPM
- Three only Hannay 6024-19-21 Hose Reels
- Hose Reel Frame PSD-969
- Hose Reel Frame PSD-968
- Flow Meter TCS 700-15

- Control Station
- Grounding Reel

PSD-947 Tanker Truck Filling/Off-Loading System (two pump assemblies)

- 1500 LPM Pump 4" Inlet
- Electric Motor 26 HP 600V 3 PH C/W Frame 284T
- Pump Base
- Hose Reel Frame PSD-968
- Hose Reel Hannay 346-33-34
- Flow Meter TCS 700-40-45
- Scully Over Fill Controller
- Bottom Loading Coupler
- Control Station
- Grounding Reel

Fire Suppression System

- Control Panel (in electrical room)
- Manifold Electric Room
- Fire Protection Fluid Container Electrical Room
- Manifold Fuel Pumping Area
- Fire Protection Fluid Container Fueling Area (in electrical room)

Electrical Room

- Fire Suppression System
- 600V Power Panel
- 120V Power Panel
- Main Breaker Panel
- Contactor Panel

Section 6: Maintenance Inspections

Inspection Schedule

Daily	Weekly	Monthly	Annually
Inspect to find problems requiring service.	Check oil level in lube oil tote tank.	Inspect hoses for cracks or damage.	Change pump bearing housing oil.
Drain water in filters.			Replace all filter cartridges.
While pumping fuel, check filter pressure differential gauge. If red, change cartridge.			
Inspect basket strainers.		While pumping fuel, check pressure gauges on each side of the strainers. If a difference of 5 PSI exists, the baskets must be cleaned.	
			Replace Scully system O-ring and corrosion pack.
Inspect for any evidence of leaks. Repair and clean spills.			
Inspect for any electrical cables frayed or pulled from strain including the Scully cable.			
Check the fire suppression system control panel to see if it's activated. Green light under AC power label should be ON.			
With the pumps running, check for excess vibration. If any, advise maintenance crew.	Check oil level in pump bearing housing.		
General clean up as needed.			

Appendix

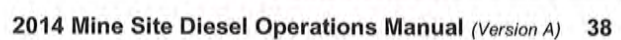
Bill of Materials

Type	No.	Description 1	Description 2	Qty Per	Unit of Measure	WHERE USED
Item	010058	CONTAINER, 40', MODIFIED, MINE	INSULATED, STL-FLOOR, DOORS, HATC	1.00	EACH	CONTAINER
Item	010074	LIGHT, FIXTURE, 4' FLOURESCENT	EXPLOSION, PROOF	4.00	EACH	
Item	010073	TRANSFORMER, CLS-1, ZONE-2	5KVA, 600-120/240	1.00	EACH	
Item	010093	HEATER, OVERHEAD, 600V	RUFFNECK, W/T-START	1.00	EACH	
Item	010075	HEATER, CONVECTION, 120V	EXPLOSION PROOF	1.00	EACH	
Item	010115	FIRE SUPPRESSION SYSTEM	AS PER QUOTE JUNE 25, 2013	1.00	EACH	
Item	006676	EXTINGUISHER, FIRE, 20LB ABC	DRY CHEMICAL	1.00	EACH	
Item	010128	LIGHT, EXTERIOR, EXP, LED-FLOOD	FMV9LCYUNV176	4.00	EACH	
Item	010127	SLIPFITTER, SFA6	FOR LED-FLOODLIGHTS	4.00	EACH	
Item	010122	BOX, JUNCTION, EXP, FUEL-MODULES	CXJ12128-H1-N1-N4-N5	1.00	EACH	
Item	010123	PANELBOARD, 600V, FUEL-MODULES	CXJ16426FC3H2-N4-E3-8C1-8RP3HL	1.00	EACH	
Item	010124	PANELBOARD, 120/240V, FUEL-MODUL	CXJ16166-FC-H2-N4-E3-6C10	1.00	EACH	
Item	010117	SWITCH, LIGHT, ON-OFF, EXP	CX-1333-X1-N4-N5-N6	2.00	EACH	
Item	010118	BREAKER, MAIN, EXP, FUEL-MODULES	XCB2-1536100	1.00	EACH	
Item	010119	CONTACTOR, ESTOP, FUEL-MODULE	CXJ8126-H1-N4-N5	1.00	EACH	
Item	010221	PUMP, 400GPM, GR, 25HP		2.00	EACH	TANKER LOADING/ OFFLOADING MODULE
Item	010078	STRAINER, BASKET, 6" FLNG	SIMPLEX, MDL-72, 1/8"SS, MESH	2.00	EACH	
Item	010185	GAUGE, WIKA, 4", 0-160PSIG	1/2"NPT, LOWER-MOUNT	1.00	EACH	
Item	010096	VALVE, RELIEF, PILOT-OPERATED, 4"	150# FLNG	1.00	EACH	
Item	010299	SCULLY, OVERFILL	INTELLITROLL, IC-OG	1.00	EACH	
Item	010300	SCULCON, JCT, W/30' WIRE	SC-8A	1.00	EACH	
Item	010301	BYPASS, AUTHORIZER, INTELLITROL		1.00	EACH	
Item	010095	VALVE, REDUCING, PILOT-OPERATED	4", 150# FLNG, W/DEADMAN	1.00	EACH	
Item	007584	HANDLE, DEADMAN, W/50' CORD	G2 MONITORING SYSTEM	1.00	EACH	
Item	010071	METER, FLOW, 4", REGIS-LITRES, DSL	RIGHT-LEFT, W/10:1 PULSER	1.00	EACH	
Item	010077	INDICATOR, FLOW, 4", FLNG	VISI-FLO, 1521RF-0402	1.00	EACH	
Item	010063	REEL, HOSE, HANNAY, 3"x40'	ELECT, REWIND	1.00	EACH	
Item	010079	HOSE, DSL, ARC, 3"x40', 3" MNPT	GOODYEAR, EXTREMFLEX	1.00	EACH	
Item	003167	COUPLER, 3", VIC-STYLE-77	W/T-GASKET	1.00	EACH	
Item	010192	REEL, PLATE, STEEL, 3"		1.00	EACH	
Item	010184	GAUGE, WIKA, 4"-30HG-30PSIG	1/2"NPT, LOWER-MOUNT	3.00	EACH	
Item	010126	STARTER, 25HP, BAFFINLAND	CXJ14286-H2-N1-N5-2C1-4N6	1.00	EACH	
Item	010120	STATIONS, CONTROL, START/STOP	CX1373-X3-N4-N5-3N6	1.00	EACH	
Item	010143	VALVE, BALL, 3-WAY, 4", 150# FLNGD	CARBON, STEEL, RTFE-SEATS	1.00	EACH	
Item	010139	VALVE, 4", 150# FLANGED	SPLIT-BODY, CARBON STEEL	8.00	EACH	
Item	010141	VALVE, 6", 150# FLANGED	CARBON-STEEL	4.00	EACH	
Item	010145	VALVE, WAFER-CHECK, 4", 150# FLNGD	CARBON-STEEL	2.00	EACH	
Item	010144	VALVE, BALL, 3-WAY, 6", 150# FLNGD	CARBON-STEEL, RTFE-SEATS	1.00	EACH	
Item	004886	COUPLER, 4" API, BOTTOM LOADING	W/TTMA 4"x3"NPT ADAPTER	1.00	EACH	
Item	010326	RELAY, OMRON	H3CR-A-AC100-240/DC100-125	1.00	EACH	
Item	010327	SOCKET, RELAY, OMRON	PCCF-11E	1.00	EACH	
Item	010331	VALVE, WAFER-CHECK, 6", 150# FLNGD	CARBON-STEEL	1.00	EACH	

Bill of Materials (continued)

Type	No.	Description 1	Description 2	Qty Per	Unit of Measure	WHERE USED
Item	010222	PUMP, ASSY, 100LPM, 1.5HP		2.00	EACH	VEHICLE REFUELING
Item	010125	STARTER, 2HP, BAFFINLAND	CXJ12246-H2-N1-N4-N5-2C1-4N6	1.00	EACH	
Item	010070	METER, FLOW, 1-1/2", REGIS-LITRES	LEFT-RIGHT, W/10:1 PULSER	1.00	EACH	
Item	010064	REEL, HOSE, HANNAY, 1"x36'	ELECT, REWIND	3.00	EACH	
Item	010183	FRAME, HOSE REEL, 1.5"		1.00	EACH	
Item	010080	HOSE, DSL, ARC, 1"x40', 1" MNPT	GOODYEAR, COLD FLEX	3.00	EACH	
Item	006507	NOZZLE, 1" OPW 7H-5400		3.00	EACH	
Item	006509	SWIVEL, 1", ULC644	w/SILICONE SEAL	3.00	EACH	
Item	010303	BREAK-AWAY, 1" OPW-66V-1300		3.00	EACH	
Item	010304	HOSE, ASSY, DSL, FUEL-DELIVERY, 1"	W/1" MNPT ENDS	3.00	EACH	
Item	010179	BASE, FILTER, SUPPORT, 31.25"x31"		1.00	EACH	
Item	003241	HOUSING, FBO-14 DPL	WITH SIGHT GLASS	2.00	EACH	
Item	003243	FILTER, ELEMENT, 25MICRON	RACOR, FBO-60338	2.00	EACH	
Item	010096	VALVE, RELIEF, PILOT-OPERATED, 4"	150 # FLNG	1.00	EACH	
Item	010120	STATIONS, CONTROL, START/STOP	CX1373-X3-N4-N5-3N6	1.00	EACH	
Item	010197	VALVE, SPLIT-BODY, 1-1/2", SS	150 # FLNGD, FIRE-SAFE	6.00	EACH	
Item	010198	VALVE, BALL, 1-1/2", CARBON-STL	SOCKET-WELD, FIRE-SAFE	10.00	EACH	
Item	010275	VALVE, WAFER-CHECK, 1-1/5", 150 #		2.00	EACH	
Item	010202	VALVE, RELIEF, 21-PSIG, 42GPM	CARBON-STL, FLANGED	1.00	EACH	
Item	010326	RELAY, OMRON	H3CR-A-AC100-240/DC100-125	2.00	EACH	
Item	010327	SOCKET, RELAY, OMRON	PCCF-11E	1.00	EACH	
Item	010222	PUMP, ASSY, 100LPM, 1.5HP		2.00	EACH	GEN SET FUELING
Item	010070	METER, FLOW, 1-1/2", REGIS-LITRES	LEFT-RIGHT, W/10:1 PULSER	1.00	EACH	
Item	010125	STARTER, 2HP, BAFFINLAND	CXJ12246-H2-N1-N4-N5-2C1-4N6	1.00	EACH	
Item	003241	HOUSING, FBO-14 DPL	WITH SIGHT GLASS	2.00	EACH	
Item	003243	FILTER, ELEMENT, 25MICRON	RACOR, FBO-60338	2.00	EACH	
Item	010096	VALVE, RELIEF, PILOT-OPERATED, 4"	150 # FLNG	1.00	EACH	
Item	010120	STATIONS, CONTROL, START/STOP	CX1373-X3-N4-N5-3N6	1.00	EACH	
Item	010197	VALVE, SPLIT-BODY, 1-1/2", SS	150 # FLNGD, FIRE-SAFE	2.00	EACH	
Item	010198	VALVE, BALL, 1-1/2", CARBON-STL	SOCKET-WELD, FIRE-SAFE	2.00	EACH	
Item	010275	VALVE, WAFER-CHECK, 1-1/5", 150 #		2.00	EACH	
Item	010202	VALVE, RELIEF, 21-PSIG, 42GPM	CARBON-STL, FLANGED	1.00	EACH	
Item	010326	RELAY, OMRON	H3CR-A-AC100-240/DC100-125	2.00	EACH	
Item	010327	SOCKET, RELAY, OMRON	PCCF-11E	1.00	EACH	
Item	10121	E-STOP, SWITCH FUEL MODULE	CX1333-X1-N4-N5-N6	4.00	EACH	MISC.
Item	010316	BOX, JUNCTION, EXP, 3/4"	W/BOTTOM FEED	4.00	EACH	
Item	002534	CAMLOCK, F, 1", AL		3.00	EACH	
Item	002233	HOSE, OIL, DSCH, 3/4"x8', ASSY	RAINDRAIN	1.00	EACH	
Item	002629	VALVE, BALL, 3/4" FNPT, SS		2.00	EACH	
Item	010648	HOSE, ASSY, AVI, 1"x36"	W/SSKC&ALUM-C	1.00	EACH	
Item	003391	HOSE, ASSY, AVI, 1"x24"	W/SSKC&ALUM-C	1.00	EACH	
Item	010649	HOSE, ASSY, AVI, 1"x48"	W/SSKC&ALUM-C	1.00	EACH	

We Engineer Solutions



Tanker Truck Filling Checklist

Warning

Quick start guides should only be used once you are trained and familiar with operational procedures. Refer to *Section 4: Operations* of the operations manual for complete instructions.

- Check the electrical room to make sure all breakers are on.
- Turn on lights, if not already on.
- If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
- Plug in Scully control system cord. If tanker truck not equipped with Scully system, deactivate system with key and attach grounding reel.
- Zero fuel meter.
- Release hose reel clutch by pulling black knob out.
- Before starting pump, ensure that the two 3-way valves are set to "loading to hose reel." Start pump.
- When full, turn off pump.
- Engage hose reel clutch by pushing black knob in.
- Retract the hose reel by pushing the rewind button and holding the button until rewind.
- Zero fuel meter.



Tanker truck fuel meter

Warning

Filling Empty Tanks

The API RP 2003 recommends limiting the initial velocity to 1m/s (500 LPM) until the tanker truck inlet is submerged by two inlet pipe diameters. After that, the flow can increase up to 3m/s (1500 LPM). A gate valve on the truck will control the flow or the ball valve near the hose reel can be also used.

Tanker Truck Off-Loading Checklist

Warning

Quick start guides should only be used once you are trained and familiar with operational procedures. Refer to *Section 4: Operations* of the operations manual for complete instructions.

- Open the right-hand fueling door.
- Attach the ground cable from the grounding reel to the tanker truck.
- Attach the tanker truck off-loading hose to the off-load port.
- Turn the 6" three-way valve #1 to "off-load to tank" (located near the off-load port).
- Turn the 4" three-way valve #2 to "off-load to tank" (located near the feed line from storage tank).
- Open the valve at the off-load port.
- Start pumps in fueling module.
- When the tanker truck is empty, turn off the pumps.
- Close the valve at the off-load port.
- Open both three-way valves back to the "loading to hose reel" positions.

*Filling
tank*

Valve #2

Valve #1



Vehicle Refueling Checklist

Warning

Quick start guides should only be used once you are trained and familiar with operational procedures. Refer to *Section 4: Operations* of the operations manual for complete instructions.

- Check the electrical room to make sure all breakers are on.
- Turn on lights, if not already on.
- If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
- Zero fuel meter.
- Pull out hose reel.
- Start pump.
- When full, turn off pump.
- Retract the hose reel by pushing the rewind button and holding the button until rewind.
- Zero fuel meter.

**Emergency stop
switch**

Fuel meter

Start/stop switch



Genset Refueling Checklist

Warning

Quick start guides should only be used once you are trained and familiar with operational procedures. Refer to *Section 4: Operations* of the operations manual for complete instructions.

- Check the electrical room to make sure all breakers are on.
- Turn on lights, if not already on.
- If lights will not come on, check emergency stop switches. Pull out any that are pushed in.
- Zero fuel meter.
- Determine how to stop the fuel flow before the Genset tank overflows.
- Start pump.
- When full, turn off pump.
- Zero fuel meter.



Warning

Filling Genset

At the time of installation, the Genset system is provided with only manual control. There are two ways to control filling. The first way is to determine how much fuel is required to fill the Genset tank and then use the flow meter reading to gauge when to shut the fuel flow off. The other option is to have a second person, who monitors the level in the tank and is in communication to advise the person running the pump, to shut off the flow before it overflows.

BAFFINLAND MINES

OPERATION AND MAINTENANCE MANUAL

Supplier:
SimplexGrinnell
1485 Lindsey Place
Delta, B.C. V3M 6V1
Phone: 604-515-8872
Fax: 604-519-1477

HATCH		VENDOR DATA REVIEW	
Doc Number	E349000-PM004-02-118-0002	Sub	01
Date Received	06/04/2014		
Review Grade		Next Submittal Status	
☐ C1 - Proceed to next submission & status		☐ Internal Review	
☐ C2 - Proceed with exceptions as noted to next submission & status		☐ Certified Final	
☐ C3 - Do not proceed, revise as noted & resubmit		☐ Final	
		☐ As-Built	
		Next Submittal Date:	
No further submission required - Complete		☒	
☒ C4 - No further submission required - Cancelled		☐	
No further submission required - Superseded		☐	
Package Coordinator: Name, signature and Date:			
KEN IMAI, Ken Imai, 23/09/2014			
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1

VERIFICATION REPORT

2

AS-BUILT / RECORD DRAWINGS

3

MAINTENANCE & INSPECTION

4

SHOP DRAWINGS / CUT SHEETS

APPENDIX C (INFORMATIVE) – FIRE ALARM SYSTEM VERIFICATION REPORTS

C1. FIRE ALARM SYSTEM VERIFICATION REPORT

(Reference: Clause 3.1.6, 3.1.7, 3.2.2)

Building Name: Baffinland Mines Fuel Modules Unit #1		Date: Aug 20 2013	
Address:			
System Manufacturer: SIMPLEXGRINNELL		Model Number: 4010ES	
		New FAS: ☒	Existing FAS:

A	System provides single-stage operation.	YES ☒	NO	
B	System provides two-stage operation.	YES	NO ☒	
C	The entire <i>fire alarm system</i> has been verified in accordance with, CAN/ULC-S537, standard for Verification of Fire Alarm Systems.	YES ☒	N/A	
D	This is a partial verification for a partial occupancy.	YES	NO ☒	N/A
E	This is a partial verification for a <i>fire alarm system</i> that has been replaced in stages.	YES	NO ☒	N/A
F	This is a verification of a portion of an existing <i>fire alarm system</i> verified in accordance with Section 6, System Modifications.	YES	NO ☒	N/A
G	Installed in accordance with the <i>design</i> and CAN/ULC-S524, Standard for the Installation of Fire Alarm Systems.	YES	NO ☒	N/A
H	The <i>fire alarm system</i> documentation is on site and includes a description of the system.	YES ☒	NO	N/A
I	The <i>fire alarm system</i> is fully functional.	YES ☒	NO	N/A
J	Comments			
K	A copy of this report will be given to the following, who is the owner or owner's representative for this <i>building</i> :	YES ☒	NO	
L	The Fire Alarm System is connected to an acceptable central monitoring station via a supervised circuit of an ULC-listed transmitter approved for the purpose. If "Yes", specify the name and location of the central monitoring station:	YES	NO ☒	

This is to certify that the information contained in this Fire Alarm System Verification Report is correct and complete.

Sami Samir

SimplexGrinnell
Company604.515.8872
TelephonePrinted Name and Signature of Qualified Person(s) conducting the Verification
(see list of acceptable verification organizations, Bulletin 2003-009-EL)

This report has been reviewed by designer and confirmed that it is consistent with the designed intent.

Printed Name and Signature of Designer

Company

Telephone

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

**CAN/ULC-S537-04
APPENDIXES**

The following Appendixes have been attached with his document:

C2.	DOCUMENTATION	YES ✓	N/A
C3.	FIELD DEVICE AND RELATED CIRCUITS – TEST AND INSPECTION	YES ✓	N/A
C4.	DATA COMMUNICATION LINK TEST	YES ✓	N/A
C5.1	CONTROL UNIT OR TRANSPONDER RECORD	YES ✓	N/A
C5.2	VOICE COMMUNICATION TEST	YES	N/A ✓
C5.3	REQUIRED SYSTEM RESPONSE TIMES	YES ✓	N/A
C5.4	CONTROL UNIT OR TRANSPONDER INSPECTION	YES ✓	N/A
C5.5	LARGE SCALE NETWORK SYSTEMS	YES	N/A ✓
C5.6	POWER SUPPLY INSPECTION	YES ✓	N/A
C5.7	EMERGENCY POWER SUPPLY TEST AND INSPECTION	YES	N/A ✓
C5.8	ANNUNCIATOR AND REMOTE TROUBLE SIGNAL UNIT TEST AND INSPECTION	YES	N/A ✓
C5.9	ANNUNCIATORS OR SEQUENTIAL DISPLAYS	YES	N/A ✓
C5.10	REMOTE TROUBLE SIGNAL UNIT TEST AND INSPECTION	YES	N/A ✓
C5.11	PRINTER TEST	YES	N/A ✓
C5.12	ANCILLARY DEVICE CIRCUIT TEST	YES ✓	N/A
C6.1	FIELD DEVICE TESTING – LEGEND AND NOTES	YES ✓	N/A
C6.2	INDIVIDUAL DEVICE RECORD	YES ✓	N/A
C6.3	SIGNALLING DEVICE SOUND LEVEL MEASUREMENT	YES	N/A ✓

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

Verification Comments:

This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

Technician

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

C2. DOCUMENTATION

(Reference: Clause 3.2.3)

C2.1 Documentation for the fire alarm system is on site and includes the following description of the fire alarm system:

A	Instructions for resetting the system and silencing alarm signals.	YES ✓	NO	N/A
B	Instructions for silencing the trouble signal and action to be taken when the trouble signal sounds.	YES ✓	NO	N/A
C	Description of the function of each operating control and indicator on the fire alarm unit.	YES ✓	NO	N/A
D	Description of the area or fire zone protected by each alarm detection circuit (this may be in the form of a list or plan drawing).	YES ✓	NO	N/A
E	Description of alarm signal operation.	YES ✓	NO	N/A
F	Description of ancillary equipment controlled by the fire alarm system.	YES ✓	NO	N/A
G	The fire alarm system has a feature for connection for fire department signaling. If connected, indicate the fire signal receiving centre:	YES	NO ✓	N/A

Date: Aug 20 2013	Partial Verification	☒ Full Verification
Building Name: Baffinland Mines Fuel Modules		

C3. FIELD DEVICE AND RELATED CIRCUITS – TEST AND INSPECTION

(Reference: Clauses 3.3.1.1, 3.3.1.3, Subsections 3.3.1, 3.3.2, 3.3.3)

A	Correct field termination and wiring size.	YES ✓	NO	N/A
B	Correct circuit polarities.	YES ✓	NO	N/A
C	An open circuit fault on a conventional device circuit causes a trouble signal.	YES ✓	NO	N/A
D	Removal of any active or supporting field device circuit causes a trouble signal.	YES ✓	NO	N/A
E	One contact device and one non-contact device tested for operation and annunciation at the control unit or transponder, when using a field verifying device.	YES ✓	NO	N/A
F	Class A circuits serving conventional field devices tested for the capability of providing an alarm signal on each side of an open circuit fault connection at an electrically remote point in the circuit.	YES ✓	NO	N/A
G	Ground fault indications occur when tested at the electrically furthest field device, and do not result in normal to off-normal status change conditions.	YES ✓	NO	N/A
H	Field device at the electrically furthest point from the power source (in every circuit) receives rated power in accordance with manufacturer's specifications.	YES ✓	NO	N/A
I	Replaceable over-current devices are of correct rating.	YES ✓	NO	N/A
J	Wire type and gauge in accordance with equipment manufacturer's installation wiring at all system termination points.	YES ✓	NO	N/A

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

C4. DATA COMMUNICATION LINK TEST

(Reference: Clause 3.2.6, Subsection 3.3.4-Note)

Control unit or transponder location: ELECTRICAL ROOM
Control unit or transponder identification:
Data communication link identification:

A	Each system abnormal condition specified in Table 1, Abnormal System Conditions, tested for each data communication link at the control unit or transponder.	YES ✓	NO	N/A
B	Tests for alarm and trouble received under a single ground fault condition conducted on each conductor of that data communication link independently.	YES ✓	NO	N/A
C	Each conductor in a data communication link, Class A (DCLA) tested for the capability of providing an alarm signal on each side of a single open circuit fault condition.	YES	NO	N/A ✓
D	Where a data communication link serves devices on more than one floor area, impose a wire-to-wire short circuit fault within each floor area and confirm receipt of trouble and alarm condition from another floor area.	YES	NO	N/A ✓
E	Where fault isolation modules are installed in data communication links serving field devices, wiring shorted on the isolated side, annunciation of the fault confirmed, and then a device on the source side operated, and activation confirmed at the control unit or transponder.	YES	NO	N/A ✓
F	Where fault isolation in data communication links is provided between control units or transponders, the field wiring shorted between each pair of control units or transponders, in turn, annunciation of the fault confirmed and operation outside the shorted section confirmed.	YES	NO	N/A ✓

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

C5. CONTROL UNIT OR TRANSPONDER RECORD

(Reference: Clause 4.1.1)

C5.1 CONTROL UNIT OR TRANSPONDER TEST

(Reference: Clauses 3.2.4, 4.2.2.1)

Control unit or transponder location: ELECTRICAL ROOM

Control unit or transponder identification:

A	Power 'on' visual indicator operates.	YES ✓	NO	N/A
B	Common visual trouble signal operates.	YES ✓	NO	N/A
C	Common audible trouble signal operates.	YES ✓	NO	N/A
D	Trouble signal silence switch operates.	YES ✓	NO	N/A
E	Main power supply failure trouble signal operates.	YES ✓	NO	N/A
F	Ground fault tested on positive and negative initiates trouble signal.	YES ✓	NO	N/A
G	Alert signal operates.	YES	NO	N/A ✓
H	Alarm signal operates.	YES ✓	NO	N/A
I	Automatic transfer from alert signal to alarm signal operates.	YES	NO	N/A ✓
J	Manual transfer from alert signal to alarm signal operates.	YES	NO	N/A ✓
K	Automatic transfer from alert signal to alarm signal cancel (acknowledge) feature operates on a two-stage system.	YES	NO	N/A ✓
L	Alarm signal silence inhibit function operates.	YES ✓	NO	N/A
M	Alarm signal manual silence operates.	YES ✓	NO	N/A
N	Alarm signal silence visual indication operates.	YES ✓	NO	N/A
O	Alarm signal, when silenced, automatically reinitiates upon subsequent alarm.	YES ✓	NO	N/A
P	Alarm signal silence automatic cut-out timer.	Time: N/A		
Q	Audible and visual alarm signals programmed and operate per design and specification.	YES ✓	NO	N/A
R	Input circuit, alarm and supervisory operation, including visual indicator operates.	YES ✓	NO	N/A
S	Input circuit supervision fault causes a trouble indication.	YES ✓	NO	N/A
T	Output circuit alarm indicators operate.	YES	NO	N/A ✓

Continued C5.1...

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

... Continued C5.1

U	Output circuit supervision fault causes a trouble indication.	YES ✓	NO	N/A
V	Visual indicator test (lamp test) operates.	YES	NO	N/A ✓
W	Coded signal sequences operate not less than the required number of times and the correct alarm signal operates thereafter.	YES ✓	NO	N/A
X	Coded signal sequences are not interrupted by subsequent alarms.	YES	NO	N/A ✓
Y	Ancillary device control circuit is rated for the intended purpose.	YES ✓	NO	N/A
Z	Ancillary device by-pass results in trouble signal.	YES ✓	NO	N/A
AA	Input circuit to output circuit operation, including ancillary device circuits (Refer to Appendix C5.12, Ancillary Device Circuit Test), for correct program operation, as per design and specification.	YES ✓	NO	N/A
BB	Fire alarm system reset operates.	YES ✓	NO	N/A
CC	Main power supply to emergency power supply transfer operates.	YES ✓	NO	N/A
DD	Control unit or transponder bonded to ground.	YES ✓	NO	N/A
EE	Status change confirmation feature (smoke detectors only) verified.	YES ✓	NO	N/A
FF	Confirm that the alarm transmission to the remote fire signal receiving centre is received.	YES	NO	N/A ✓
GG	Confirm that the supervisory transmission to the fire signal receiving centre is received.	YES	NO	N/A ✓
HH	Confirm that the trouble transmission to the fire signal receiving centre is received.	YES	NO	N/A ✓
II	If connected, record the name and telephone number of the fire signal receiving centre.	Name: Phone:		
JJ	Operation of the fire signal receiving centre disconnect means results in a specific trouble indication at the control unit or transponder and transmits a trouble signal to the fire signal receiving centre.	YES ✓	NO	N/A ✓

Date: Aug 20 2013

Partial Verification

☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

C5.2 VOICE COMMUNICATION TEST

(Reference: Clauses 3.2.4, 4.2.3.1)

A	Power 'on' indicator operates.	YES		NO		N/A	✓
B	Common visual trouble signal operates.	YES		NO		N/A	✓
C	Common audible trouble signal operates.	YES		NO		N/A	✓
D	Trouble signal silence switch operates.	YES		NO		N/A	✓
E	All-call voice paging, including visual indicator, operates.	YES		NO		N/A	✓
F	Output circuits for selective voice paging, including visual indication operates.	YES		NO		N/A	✓
G	Output circuits for selective voice paging trouble operation, including visual indication, operates.	YES		NO		N/A	✓
H	Microphone, including press to talk switch, operates.	YES		NO		N/A	✓
I	Operation of voice paging does not interfere with initial inhibit time of alert signal and alarm signal.	YES		NO		N/A	✓
J	All-call voice paging operates (on emergency power supply).	YES		NO		N/A	✓
K	Upon failure of one amplifier, system automatically transfers to backup amplifier(s).	YES		NO		N/A	✓
L	Circuits for emergency telephone call-in operation, including audible and visual indication operates.	YES		NO		N/A	✓
M	Circuits for emergency telephones for operation, including two-way voice communication, operate.	YES		NO		N/A	✓
N	Circuits for emergency telephone trouble operation, including visual indication, operate.	YES		NO		N/A	✓
O	Emergency telephone verbal communication operates.	YES		NO		N/A	✓
P	Emergency telephone operable or in-use tone at handset operates.	YES		NO		N/A	✓

Date: Aug 20 2013

Partial Verification

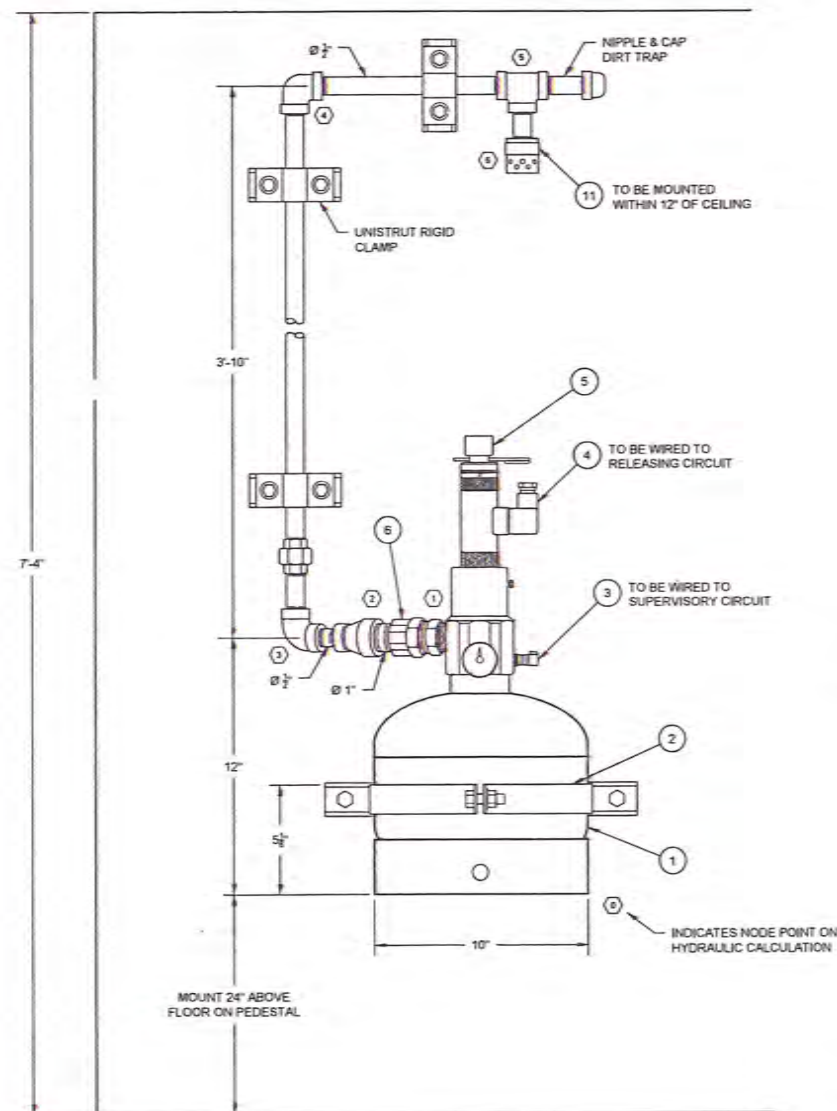
☒ Full Verification

Building Name: Baffinland Mines Fuel Modules

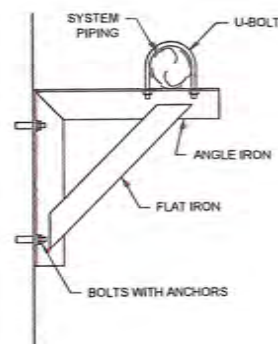
C5.3 REQUIRED SYSTEM RESPONSE TIMES

(Reference: Clause 4.2.4.1)

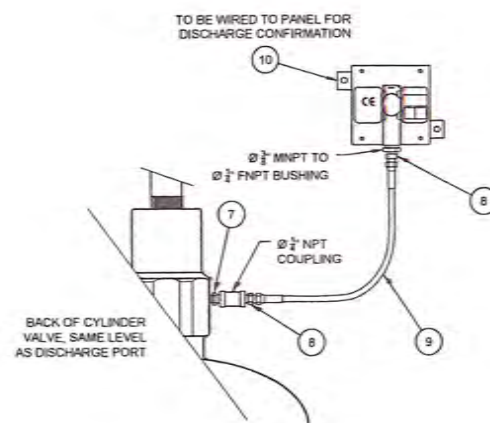
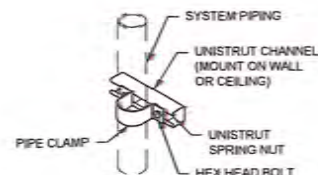
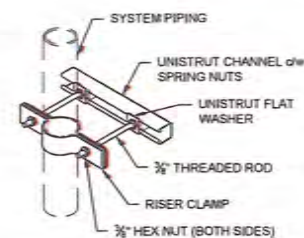
A	Audible signal devices and visible signal devices operated within 10 s. and Subsequent input operated within 10 s.	YES ✓	NO	
		YES ✓	NO	
B	Remote connection operated within 10 s.	YES	NO	N/A ✓
C	Releasing device start of sequence operated within 10 s.	YES ✓	NO	N/A
D	Required annunciation operated within 10 s. and Subsequent input operation within 10 s.	YES ✓	NO	
		YES ✓	NO	
E	Required central alarm and control facility operated within 10 s. and Subsequent input operation within 10 s.	YES	NO	N/A ✓
		YES	NO	
F	Ancillary Circuits operated within 10 s. and Subsequent input operation within 30 s.	YES	NO	N/A ✓
		YES	NO	



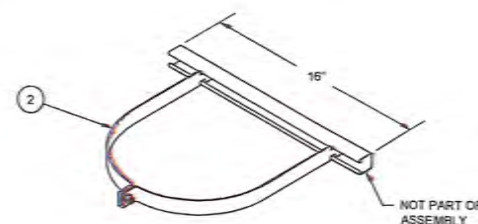
LAYOUT OF SAPPHIRE SYSTEM DETAILS
NTS



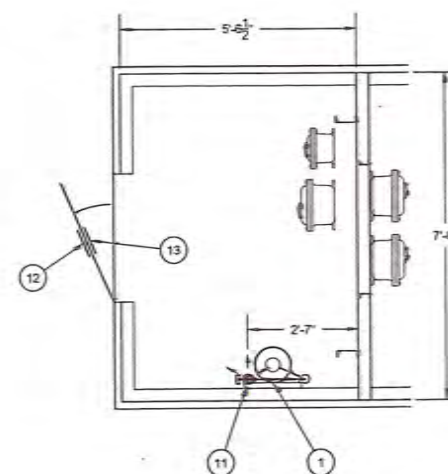
TYPICAL PIPE MOUNTING DETAILS
NTS



PRESSURE SWITCH DETAIL
NTS



CYLINDER CLAMP DETAIL
NTS



PLAN LAYOUT OF CONTAINER
SCALE: 1/2"=1'-0"

ITEM	QTY	PART NO	DESCRIPTION
1	1	570635	20 LB CYLINDER ASSEMBLY c/w 18 LBS NOVEC 1230
2	1	570385	WALL MOUNTED CYLINDER BRACKET - 10" CYLINDERS
3	1	570565	LOW PRESSURE SWITCH
4	1	570537	SOLENOID ACTUATOR - 24V DC
5	1	570549	LOCAL MANUAL ACTUATOR
6	1	570557	SINGLE TANK SWIVEL ADAPTOR, 1" BSP TO 1" FNPT
7	1	570342	MALE ADAPTOR 1/4" BSP x 1/4" MNPT
8	2	32338	MALE ACT. CONNECTOR 1/4" MNPT x 7/16-20 FLARE
9	1	32336	S.S. ACTUATION HOSE, 24", 7/16-20 FLARE BOTH ENDS
10	1	437900	PRESSURE OPERATED SWITCH - 3PDT
11	1	570515	1/2" FNPT NOZZLE 7 PORT 180° SIDE WALL (260mm)
12	1	570580	ENTRANCE WARNING SIGN
13	1	570581	EXIT WARNING SIGN
14			
15			
16			
17			
18			
19			
20			

INSTALLATION NOTES:
REFER TO SAPPHIRE ENGINEERED SYSTEMS MANUAL FOR EQUIPMENT AND INSTALLATION DETAILS

PIPING
PIPING TO BE BLACK OR GALVANIZED SCHEDULE 40 AS FOLLOWS:
ASTM A-53B OR A, A-106B OR A, SEAMLESS, THREADED AND WELDED IN SIZES FROM 3/8" TO 6".
ASTM A-53B OR A, ERW, THREADED AND WELDED IN SIZES FROM 3/8" TO 6".
ASTM FURNACE WELD CLASS F, THREADED AND WELDED IN SIZES FROM 3/8" TO 6".

FITTINGS
1. FITTINGS UP TO 3" TO BE CLASS 300 LB MALLEABLE OR DUCTILE IRON. FITTINGS OVER 3" TO BE 1000 LB DUCTILE IRON OR FORGED STEEL. FLANGED JOINTS SHALL BE CLASS 300 LB.
2. CLASS 150 LB AND CAST IRON FITTINGS NOT TO BE USED.
3. REDUCING FITTINGS OR COUPLINGS TO BE USED FOR CHANGES IN PIPE SIZE. REDUCING BUSHINGS ACCEPTABLE FOR REDUCTIONS ONLY. 3000 LB FORGED STEEL TO BE USED FOR A SINGLE PIPE SIZE REDUCTION AND CLASS 300 MALLEABLE IRON TO BE USED FOR TWO OR MORE SIZE REDUCTIONS. ALL UNIONS TO BE FORGED STEEL.

INSTALLATION
1. CYLINDER LOCATION TO BE MAINTAINED AT AN AMBIENT TEMPERATURE OF 0°C (32°F) TO 54°C (130°F).

2. SINGLE CYLINDER STRAPS WHEN ATTACHED TO SOLID WALLS SHOULD USE ALLOY EXPANSION SHIELDS OR EQUIVALENT WHEN USING MACHINE BOLTS. LEAD SHIELDS ARE NOT ACCEPTABLE. MINIMUM BOLT SIZE TO BE 1/2" DIAMETER.

3. PIPES TO BE SWAGED CLEAN INTERNALLY OF ALL CUTTING OIL AND DEBRIS PRIOR TO ASSEMBLY USING DEGREASING SOLVENT AND RAGS.

4. ALL THREADED JOINTS TO USE TEFLON TAPE OR SIMILAR MATERIAL APPLIED TO MALE THREADS ONLY.

5. PIPING TO BE HUNG SECURELY AS PER ANSI B-31.1 AND INSTALLED ACCORDING TO PROPER COMMERCIAL PRACTICES USING LISTED AND APPROVED HANGERS.

6. PIPING TO BE FASTENED RIGIDLY AND BRACED AGAINST THRUST FORCES, WITHIN 1' OF NOZZLES AND AT ALL CHANGES OF DIRECTION.
7. ALL TEES TO BE MOUNTED IN THE HORIZONTAL POSITION. TEE SIDES ARE NOT TO BE MOUNTED IN THE VERTICAL POSITION UNLESS SPECIFICALLY NOTED OR SHOWN OTHERWISE.

8. BEFORE INSTALLING NOZZLES, ALL PIPING TO BE PRESSURE TESTED AS PER NFPA 2001 FOR LEAKAGE, AND TO BE BLOWN OUT USING COMPRESSED AIR OR NITROGEN.

9. ALL NOZZLES TO BE MOUNTED WITH NOZZLE ORIENTATION AS SHOWN. NOZZLES TO BE A MAXIMUM OF 12" BELOW CEILING AND 2" TO 12" FROM A WALL FOR SIDEWALL NOZZLES. ALL NOZZLES TO END IN A DIRT TRAP CONSISTING OF A TEE FITTING WITH A NIPPLE AND CAP ON THE THROUGH PART OF THE TEE.

10. FOR FALSE CEILINGS COMPRISING LOOSE TILES, ALL TILES WITHIN A 6 FT (1.8M) RADIUS OF THE NOZZLE ARE TO BE FASTENED DOWN.

11. NO DEVIATION MAY BE MADE TO THE SYSTEM LAYOUT WITHOUT THE APPROVAL OF SIMPLEXGRINNELL. PIPE LENGTHS ARE APPROXIMATE AND ARE NOT FOR PREFABRICATION.

12. DOORS, WINDOWS AND ANY OPENINGS TO BE SEALED AGAINST LOSS OF AGENT USING SUITABLE SEALS TO AID IN RETENTION OF AGENT.
13. CONCRETE BLOCK WALLS IN HAZARD AREAS SHALL BE PAINTED TO PREVENT LEAKAGE OF AGENT THROUGH WALL.

14. QUANTITY OF AGENT SUPPLIED IS BASED ON CALCULATIONS DONE USING THE DRAWINGS AND INFORMATION SUPPLIED.

15. DIMENSIONS SHOWN ON DRAWINGS FOR ESTIMATION AND CALCULATION PURPOSES ONLY. ACTUAL SITE CONDITIONS MAY REQUIRE CHANGES TO SYSTEM DESIGN.

16. ANY OUTSIDE VENTILATION SYSTEMS TO BE SHUTDOWN PRIOR TO DISCHARGE OF EXTINGUISHING AGENT TO AVOID LOSS OF AGENT. RECIRCULATING VENTILATION SYSTEMS CAN BE LEFT ON TO FACILITATE HOMOGENOUS MIXING OF AGENT THROUGHOUT THE ENTIRE AREA IF THIS VOLUME HAS BEEN ADDED INTO THE ROOM AREA.

PIPE SIZE	MAXIMUM HANGER SPACING
1/2"	5 FT (1.52 m)
3/4"	6 FT (1.83 m)
1"	7 FT (2.13 m)
1 1/4"	8 FT (2.44 m)
1 1/2"	9 FT (2.74 m)
2"	11 FT (3.35 m)
2 1/2"	11 FT (3.35 m)
3"	12 FT (3.35 m)

HANGERS MUST BE PLACED WITHIN 12" OF THE DISCHARGE NOZZLE.
HANGERS MUST BE PLACED BETWEEN ELBOWS THAT ARE MORE THAN 12" APART.
HANGERS MUST BE FIXED TO STRUCTURES CAPABLE OF SUPPORTING PIPE WORK.



AREA	HEIGHT	PROTECTED VOLUME	CONCENTRATION	ELEVATION	NOVEC 1230
ELECTRICAL ROOM	7'-4"	319.1 cu ft	5.656%	0 FT	18 LBS

SimplexGrinnell
 Fire & Security

1485 LINDEBY PLACE
 DELTA, BC V2M 6Y1
 SALES: 604-519-1477
 SERVICE: 604-519-0872
 FAX: 604-519-0872

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REVISION DESCRIPTION
 NO. DATE
 00 JUL 2013
 01 JUL 2013

LAYOUT OF SAPPHIRE FIRE SUPPRESSION SYSTEM FOR
 PROTECTION OF MODULAR ELECTRICAL ROOM
 BAYFINLAND IRON MINES
 611 QUEEN ELIZABETH WAY, SUITE 103, CORPORATION ISLAND
 ISLAND, MANITOBA R2G 0H0

DRAWN BY: PJB
 DESIGNED BY: PJB
 APPROVED BY:

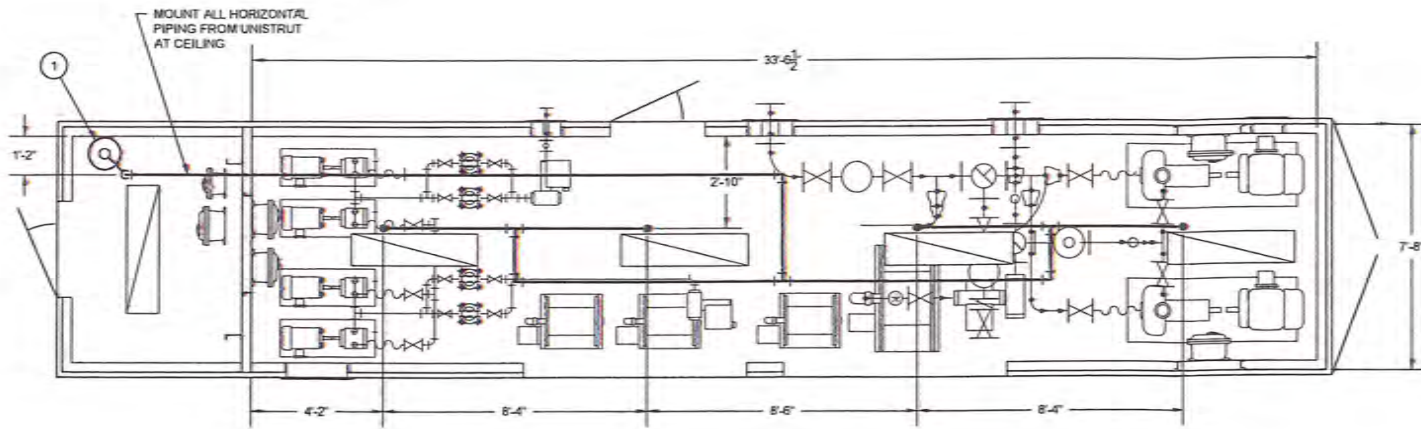
DATE: JULY 17, 2013
 DATE: JULY 17, 2013
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PROJECT NUMBER:
 482827201

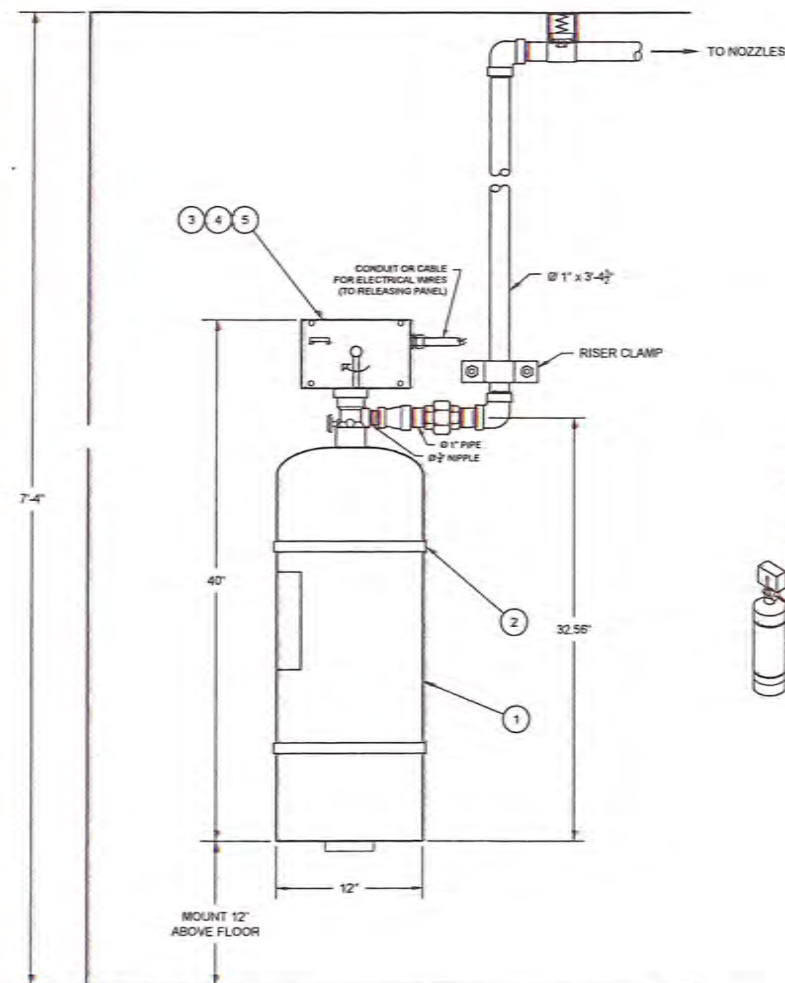
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 SAPPHIRE CYLINDER
 AND PIPING LAYOUT

SHEET NUMBER:
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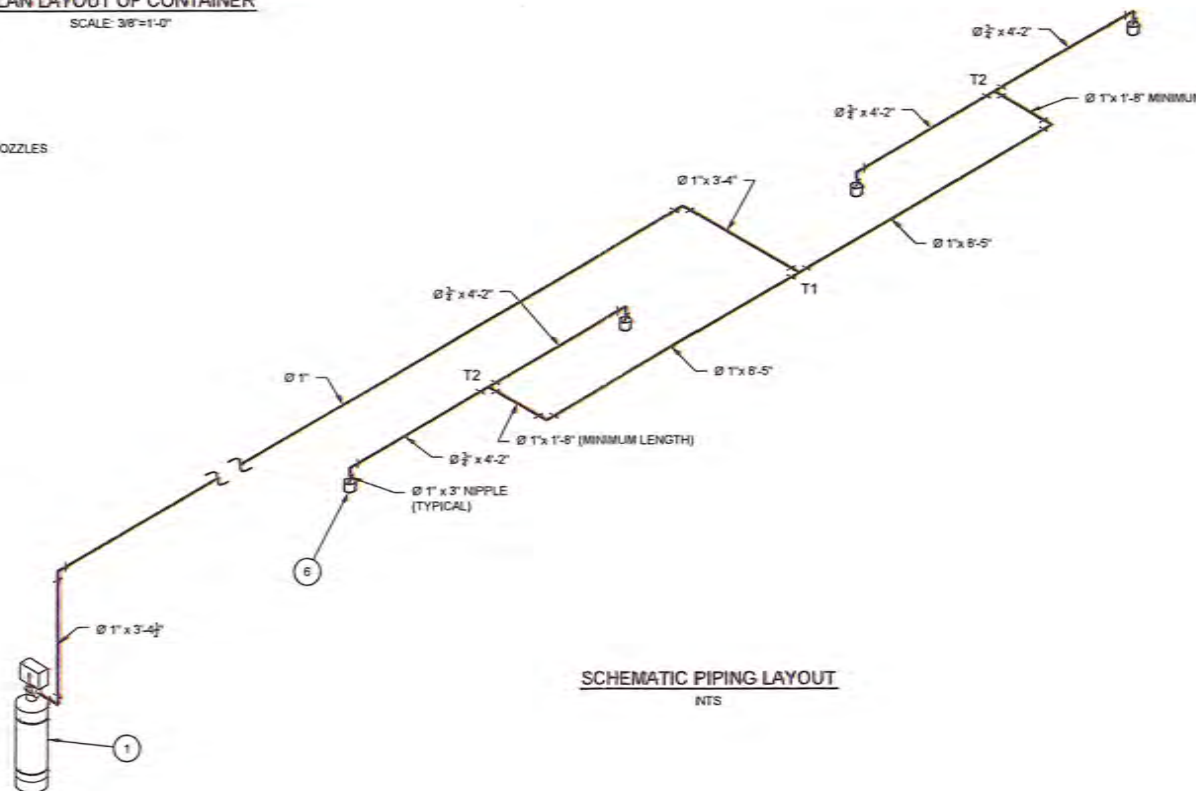
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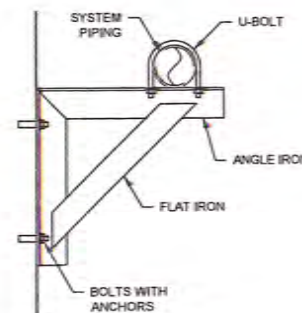
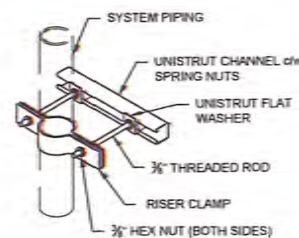
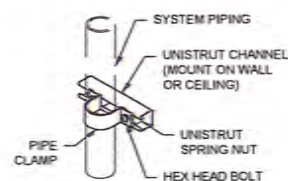
PLAN LAYOUT OF CONTAINER
SCALE: 3/8"=1'-0"



DETAIL AT CYLINDER
NTS



SCHEMATIC PIPING LAYOUT
NTS



TYPICAL PIPE MOUNTING DETAILS
NTS

ITEM	QTY	PART NO	DESCRIPTION
1	1	551124	PCI-70ABC-ULC 70 LB DRY CHEMICAL CYLINDER ASSY.- 3/4" FNPT
2	1	550965	MB-ATD MOUNTING BRACKET FOR 70 LB CYLINDER
3	1	551201	ECH3-24 ELECTRICAL CONTROL HEAD W/ LOCAL ACTUATION
4	1	550077	ALARM INITIATING SWITCH
5	1	552173	MICRO SWITCH EXTENSION KIT
6	4	551878	NF-ABC TOTAL FLOOD NOZZLE WITH CAP
7	1	551059	CO2-S CARBON DIOXIDE ACTUATION CARTRIDGE (PKG OF 8)
8			
9			
10			

INSTALLATION NOTES:

REFER TO MONARCH INDUSTRIAL FIRE SUPPRESSION MANUAL FOR EQUIPMENT AND INSTALLATION DETAILS (PART NO. 553565 - FEB 1, 2010)
REFER TO NFPA 17 FOR INSTALLATION, MAINTENANCE AND INSPECTION OF PRE-ENGINEERED DRY CHEMICAL SYSTEMS.

PIPING

FERROUS PIPING: BLACK OR GALVANIZED STEEL PIPE SHALL BE EITHER ASTM A-53 OR ASTM A-120 SCH 40. CAST IRON PIPE IS NOT ACCEPTABLE.

FITTINGS

ALL FITTINGS TO BE BLACK OR GALVANIZED CLASS 150 MALLEABLE OR DUCTILE IRON. REDUCING TEES ARE TO BE USED FOR ALL PIPE SPLITS. REDUCING BUSHINGS AND CAST IRON FITTINGS ARE NOT ACCEPTABLE.

INSTALLATION

- OPERATING TEMPERATURE OF SYSTEM IS FROM A MINIMUM OF -20°F (-28°C) TO A MAXIMUM 120°F (49°C).
- CYLINDER STRAPS TO BE SECURED USING BOLTS OR LAG SCREWS.
- PIPES TO BE SWABBED CLEAN INTERNALLY OF ALL CUTTING OIL, METAL CHIPS ETC. PRIOR TO ASSEMBLY.
- ALL THREADED JOINTS TO USE TEFLON TAPE OR SIMILAR MATERIAL APPLIED TO MALE THREADS ONLY.
- PIPING TO BE HUNG SECURELY AS PER ANSI B-31.1 AND INSTALLED ACCORDING TO GOOD COMMERCIAL PRACTICES USING LISTED AND APPROVED HANGERS.
- PIPING TO BE FASTENED SECURELY AND BRACED AGAINST THRUST FORCES AT ALL NOZZLES (WITHIN 1 FT) AND CHANGE OF DIRECTION FITTINGS.
- ALL SYSTEM PIPING MUST COMPLY WITH SECTION A-3.9.1 OF NFPA-17.
- ALL NOZZLES TO BE MOUNTED WITH NOZZLE ORIENTATION AS SHOWN WITH DISCHARGE HOLES TO BE WITHIN 6" OF CEILING.
- PIPE LENGTHS ARE APPROXIMATE AND NOT TO BE USED FOR PREFABRICATION.
- PIPE HANGER SPACING TO BE AS FOLLOWS:
1/2" PIPE 6 FEET
3/4" PIPE 8 FEET
1" PIPE 12 FEET
- ANY CHANGES IN DIRECTION IN AN EXHAUST SYSTEM TO BE PROTECTED WITH ADDITIONAL NOZZLES.
- REFER TO GENERAL PURPOSE TOTAL FLOODING DESIGN SECTION OF MANUAL FOR PIPE AND FITTING LIMITATIONS FOR PCI-70ABC WITH 4 NF-ABC NOZZLES.
- IF APPLICABLE, ALL ACTUATION LINES TO CYLINDER HEADS TO BE 1/4" OD COPPER TUBING WITH FLARED FITTINGS AT ALL CONNECTIONS. REFER TO MANUAL FOR ACTUATION LINE TYPE AND LIMITATIONS. TUBING TO BE PROTECTED AGAINST MECHANICAL DAMAGE AND TO BE TESTED AS PER GUIDE LINES LISTED IN THE INSTALLATION MANUAL.
- VENTILATION EQUIPMENT SHUTDOWNS AND DOOR CLOSURES TO BE INITIATED DURING RELEASING PANEL TIME DELAY PERIOD, BEFORE SYSTEM ACTIVATION.
- REFER TO ELECTRICAL DRAWING FOR ELECTRICAL DEVICE LAYOUT AND WIRING DIAGRAM.

PIPING SECTION	SIZE	MAX LENGTH	MAX ELBOWS
CYL - T1	1"	30 FT	3
T1 - T2	1"	14 FT	2
T2 - NOZZLE	3/4"	9 FT	2

DESIGN PARAMETERS FOR PAINT BOOTH NV-WA NOZZLES

SIDE 1 - 8 FT, HEIGHT 8 FT, SIDE 2 - 14.97 FT
WIDTH 7.87 FT / 8 FT = 1 NOZZLE
LENGTH 33.82 FT / 14.97 FT = 3 NOZZLES
TOTAL FOR NOZZLES - 1 x 3 = 3 NOZZLES MINIMUM

"AS BUILT"

NOV 21 2013

tyco Fire & Security **SimplexGrinnell**

1405 LINDSEY PLACE
DELTA, BC V3M 6V1
SALES: 604-518-1477
SERVICE: 604-518-1477
FAX: 604-518-1477

REVISION DESCRIPTION

NO.	DATE	ISSUED
00	JUL 2013	

LAYOUT OF MONARCH DRY CHEMICAL FIRE SUPPRESSION SYSTEM FOR PROTECTION OF MODULAR FUEL PUMP ROOM

BAYTANLAND IRON MINES

611 QUEEN ELIZABETH WAY, SUITE 103 - CORPORATION / CALUIT / CALUIT, MANUUT X0A 010

DRAWN BY: PuB DATE: JULY 18, 2013

DESIGNED BY: PuB DATE: JULY 18, 2013

APPROVED BY: DATE:

PROJECT NUMBER: 480267201

SHEET TITLE: MONARCH CYLINDER AND PIPING LAYOUT

SHEET NUMBER: 13-07-22-2

REV. CD:



SECTION II

UL EX-4510 9-1-10 Page 2-1

REV. 1



Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12] 04/09/2007



Material Safety Data Sheet

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SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12]

MANUFACTURER: 3M

DIVISION: Electronics Markets Materials Division

ADDRESS: 3M Center
St. Paul, MN 55144-1000

EMERGENCY PHONE: 1-800-364-3577 or (651) 737-6501 (24 hours)

Issue Date: 04/09/2007

Supersedes Date: 09/11/2006

Document Group: 16-3425-2

Product Use:

Intended Use: STREAMING AND FLOODING FIRE PROTECTION

SECTION 2: INGREDIENTS

<u>Ingredient</u>	<u>C.A.S. No.</u>	<u>% by Wt</u>
1,1,1,2,2,4,5,5,5-NONAFLUORO-4-(TRIFLUOROMETHYL)-3-PENTANONE	756-13-8	> 99.9

SECTION 3: HAZARDS IDENTIFICATION

3.1 EMERGENCY OVERVIEW

Specific Physical Form: Liquid

Odor, Color, Grade: clear colorless, low odor.

General Physical Form: Liquid

Immediate health, physical, and environmental hazards:

3.2 POTENTIAL HEALTH EFFECTS

Eye Contact:

Contact with the eyes during product use is not expected to result in significant irritation.

Skin Contact:

Contact with the skin during product use is not expected to result in significant irritation.

SECTION II

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REV. 1

Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12] 04/09/2007

Inhalation:

If thermal decomposition occurs:
May be harmful if inhaled.

Ingestion:

No health effects are expected.

3.3 POTENTIAL ENVIRONMENTAL EFFECTS

This substance has a high Henry's Law constant and therefore will be primarily found in the atmosphere where photolysis will be the dominant reaction pathway. The ultimate degradation products of the photolysis reaction are HF, CO₂ and trifluoroacetic acid (TFA).

This substance does not contribute to ozone depletion; it has an atmospheric lifetime of approximately 5 days and a Global Warming Potential (GWP) of 1 (IPCC 2001 Method).

SECTION 4: FIRST AID MEASURES

4.1 FIRST AID PROCEDURES

The following first aid recommendations are based on an assumption that appropriate personal and industrial hygiene practices are followed.

Eye Contact: No need for first aid is anticipated.

Skin Contact: No need for first aid is anticipated.

Inhalation: If signs/symptoms develop, remove person to fresh air. If signs/symptoms persist, get medical attention.

If Swallowed: No need for first aid is anticipated.

SECTION 5: FIRE FIGHTING MEASURES

5.1 FLAMMABLE PROPERTIES

Autoignition temperature

Flash Point

Flammable Limits - LEL

Flammable Limits - UEL

Not Applicable

Not Applicable

[Details: Nonflammable]

[Details: Nonflammable]

5.2 EXTINGUISHING MEDIA

Product is a fire-extinguishing agent.

5.3 PROTECTION OF FIRE FIGHTERS

SECTION II

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REV. 1

Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12] 04/09/2007

Special Fire Fighting Procedures: Wear full protective equipment (Bunker Gear) and a self-contained breathing apparatus (SCBA).

Unusual Fire and Explosion Hazards: Not applicable.

Note: See STABILITY AND REACTIVITY (SECTION 10) for hazardous combustion and thermal decomposition information.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Observe precautions from other sections. Call 3M-HELPS line (1-800-364-3577) for more information on handling and managing the spill. Ventilate the area with fresh air. Contain spill. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Collect as much of the spilled material as possible. Clean up residue. Place in a metal container approved for transportation by appropriate authorities. Seal the container. Dispose of collected material as soon as possible.

In the event of a release of this material, the user should determine if the release qualifies as reportable according to local, state, and federal regulations.

SECTION 7: HANDLING AND STORAGE

7.1 HANDLING

For industrial or professional use only. Contents may be under pressure, open carefully. Avoid breathing of vapors, mists or spray. Do not breathe thermal decomposition products.

7.2 STORAGE

Keep container in well-ventilated area. Store out of direct sunlight. Store away from heat. Store away from strong bases, amines, and alcohols.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 ENGINEERING CONTROLS

Provide appropriate local exhaust ventilation on open containers. Provide appropriate local exhaust when product is heated.

8.2 PERSONAL PROTECTIVE EQUIPMENT (PPE)

8.2.1 Eye/Face Protection

As a good industrial hygiene practice:

Avoid eye contact with vapors, mists, or spray.

8.2.2 Skin Protection

Gloves are not required.

8.2.3 Respiratory Protection

Under normal use conditions, airborne exposures are not expected to be significant enough to require respiratory protection.

As a good industrial hygiene practice:

SECTION II

UL EX-4510 9-1-10 Page 2-4

REV. 1

Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Novec (TM) 1230 Fire Protection Fluid [EK-5-1-12] 04/09/2007

Avoid breathing of vapors, mists or spray.

If thermal decomposition occurs, wear supplied air respiratory protection.

8.2.4 Prevention of Swallowing

Not applicable.

8.3 EXPOSURE GUIDELINES

<u>Ingredient</u>	<u>Authority</u>	<u>Type</u>	<u>Limit</u>	<u>Additional Information</u>
1,1,1,2,2,4,5,5,5-NONAFLUORO-4-(TRIFLUOROMETHYL)-3-PENTANONE	3M	TWA	150 ppm	

SOURCE OF EXPOSURE LIMIT DATA:

ACGIH: American Conference of Governmental Industrial Hygienists

CMRG: Chemical Manufacturer Recommended Guideline

OSHA: Occupational Safety and Health Administration

AIHA: American Industrial Hygiene Association Workplace Environmental Exposure Level (WEEL)

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Specific Physical Form:	Liquid
Odor, Color, Grade:	clear colorless, low odor.
General Physical Form:	Liquid
Autoignition temperature	Not Applicable
Flash Point	Not Applicable
Flammable Limits - LEL	[Details: Nonflammable]
Flammable Limits - UEL	[Details: Nonflammable]
Boiling point	49 °C
Vapor Density	11.6 [Ref Std: AIR=1]
Vapor Pressure	244 mmHg [@ 20 °C]
Specific Gravity	1.6 [Ref Std: WATER=1]
pH	Not Applicable
Melting point	-108 °C
Solubility in Water	Nil
Evaporation rate	> 1 [Ref Std: BUOAC=1]
Volatile Organic Compounds	1600 g/l [Test Method: calculated SCAQMD rule 443.1]
Percent volatile	100 %
VOC Less H2O & Exempt Solvents	1600 g/l [Test Method: calculated SCAQMD rule 443.1]
Viscosity	0.6 centipoise [@ 25 °C]

SECTION 10: STABILITY AND REACTIVITY

Stability: Stable.

Materials and Conditions to Avoid: Strong bases; Amines; Alcohols Additional Information: Listed materials to avoid should not be mixed with liquid Novec 1230 fluid. Avoid direct sunlight and ultraviolet light.

SECTION II

UL EX-4510 9-1-10 Page 2-5

REV. 1

Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Nover (TM) 1230 Fire Protection Fluid [FK-5-1-12] 04/09/2007

Hazardous Polymerization: Hazardous polymerization will not occur.

Hazardous Decomposition or By-Products

<u>Substance</u>	<u>Condition</u>
Carbon monoxide	During Combustion
Carbon dioxide	During Combustion
Hydrogen Fluoride	During Combustion

Hazardous Decomposition: Hydrogen fluoride has an ACGIH Threshold Limit Value of 3 parts per million (as fluoride) as a Ceiling Limit and an OSHA PEL of 3 ppm of fluoride as an eight hour Time-Weighted Average and 6 ppm of fluoride as a Short Term Exposure Limit. The odor threshold for HF is 0.04 ppm, providing good warning properties for exposure.

SECTION 11: TOXICOLOGICAL INFORMATION

Please contact the address listed on the first page of the MSDS for Toxicological Information on this material and/or its components.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICOLOGICAL INFORMATION

Please refer to existing literature on TFA

CHEMICAL FATE INFORMATION

Photolytic half-life: 3-5 days.

Photolytic degradation products may include Trifluoroacetic acid (TFA)

NOTE: Hydrolysis is not expected to be a significant degradation pathway. Product is highly insoluble in water and volatile, and use as a clean extinguishing agent would not typically result in releases to aquatic environments.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method: Incinerate in an industrial or commercial facility in the presence of a combustible material. Combustion products will include HF. Facility must be capable of handling halogenated materials.

As a disposal alternative, dispose of waste product in a facility permitted to accept chemical waste. Reclaim if feasible. For information on product return, contact your distributor.

EPA Hazardous Waste Number (RCRA): Not regulated

Since regulations vary, consult applicable regulations or authorities before disposal.

SECTION 14: TRANSPORT INFORMATION

ID Number(s):

98-0212-3031-7, 98-0212-3201-6, 98-0212-3203-2, 98-0212-3217-2, 98-0212-3371-7, 98-0212-3414-5

SECTION II

JUL EX-4510 9-1-10 Page 2-6

REV. 1

Material Safety Data Sheet

3M MATERIAL SAFETY DATA SHEET 3M(TM) Novec (TM) 1230 Fire Protection Fluid [FK-5-1-12] 04/09/2007

Please contact the emergency numbers listed on the first page of the MSDS for Transportation Information for this material.

SECTION 15: REGULATORY INFORMATION

US FEDERAL REGULATIONS

Contact 3M for more information.

311/312 Hazard Categories:

Fire Hazard - No Pressure Hazard - No Reactivity Hazard - No Immediate Hazard - No Delayed Hazard - No

STATE REGULATIONS

Contact 3M for more information.

CHEMICAL INVENTORIES

The components of this product are in compliance with the chemical notification requirements of TSCA.

One or more of the components of this product have been notified to ELINCS (European List of Notified or New Chemical Substances). Certain restrictions apply. Contact the selling division for additional information.

All the components of this product are listed on China's Inventory of Chemical Substances.

The components of this material are in compliance with the new chemical notification requirements for the Korean Existing Chemicals Inventory.

Contact 3M for more information.

Additional Information: The components of this product are in compliance with the chemical notification requirements of the National Industrial Chemical Notification and Assessment Scheme (NICNAS) of Australia, the Canadian Environmental Protection Act (CEPA) and the Ministry of Economy, Trade and Industry of Japan.

INTERNATIONAL REGULATIONS

Contact 3M for more information.

ADDITIONAL INFORMATION

U.S. EPA. Significant New Alternatives Policy Program (SNAP) approved for uses is streaming and flooding fire protection