Clean Air Act 112(r) Risk Management Program (RMP) SPCC/FRP EPCRA

CHEMICAL EMERGENCY PREVENTION & PLANNING Newsletter

September - October 2011 US EPA Region 10

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CHEMICAL EMERGENCY PREVENTION & PLANNING
Newsletter

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REPORT
CHEMICAL or OIL SPILLS
to the NATIONAL RESPONSE CENTER
1-800-424-8802

Best Practices from the Field

During RMP training and inspections we meet talented people with innovative ideas. This issue the focus is on developing Standard Operating Procedures. James Hampton, Chief Engineer, Westward Seafoods and Amy Duz, Hazardous Materials Instructor, OSHA Institute, University of Washington; *walk us through the development process showing how to cover all the bases.*

The SOP on Developing Standard Operating Procedures

James Hampton, Chief Engineer, Westward (Alyeska) Seafoods Inc., Dutch Harbor, AK and Amy Duz, (amyduz@iworkwise.com)

As we develop the SOP for new processes or changes to existing systems, we always have safety in mind. We want the operator to have all the information they need to operate safely.

Our SOP

To ensure the format includes all required categories of information we ask: does it address the following?

- Operating limits
- Consequences of deviation and steps required to avoid a deviation
- Safety systems and their functions
- Steps for each operating phase
- Safety and health considerations including precautions needed during the procedure to prevent exposure

The EPA check list [68.69] may be used to make sure it does. (See for complete list of requirements.)

To address operating limits, safety systems, consequences of deviation, and steps to correct the deviations, we use a table (see Page 2 Example SOP - RSW System SOP).

We gather the necessary equipment specifications and engineering data, review drawings and discuss the equipment with operators as necessary to complete the table.

Next we document the procedures, one operating phase at a time. Necessary precautions including PPE are reviewed and included in the procedures.

Photographs and/or diagrams are used as needed to make the procedure clear. Procedures are reviewed by multiple people to help ensure they are

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Best Practices from the Field

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clear and correct, and to help ensure actions do not inadvertently create hazards (trapping liquid refrigerant, for example). Operators review the procedure prior to startup and their suggestions are used to make improvements.

We write SOPs for every contingency: fire, earthquake, power failure, emergency shutdown, releases, and handling reasonably anticipated abnormal conditions. Errors can be made when operating relatively simple equipment as well as complex equipment; clear SOPs will help operators avoid these errors. Using SOPs for training helps assure all the operators are operating plant equipment in the same, safe way.

For more information: Risk Management Program Guidance Chapters 6 and 7

Example SOP: RSW System SOP

The following Standard Operating Procedure (SOP) pertains to and is written for a refrigerated sea water (RSW) chiller system. This equipment chills the seawater that is used to keep fresh fish at the proper temperature as they are held briefly in storage tanks prior to being processed.

The RSW package consists of a surge vessel and a plate and frame chiller. Pressure is controlled by a back pressure regulator; a minimum flow control switch is installed to prevent freeze-up. *(Editor's note) The following SOP examples are excerpts from the original. They have been edited for space and to highlight "Best Practice Procedures."*

RSW SYSTEM
(REFRIGERATED SEA-WATER)

Operating Limits/Deviations/ Corrections should be included in SOP

OPERATING LIMITS/DEVIATIONS

EQUIPMENT: BOOSTERS

OPERATING LIMITS	SAFETIES	DEVIATIONS/ CONSEQUENCES	STEPS TO CORRECT DEVIATION
Discharge pressure 15 to 35 psig	HPCO and alarm @ 50 psig SRV @ 150 psig	Compressor shuts down SRV relieves to atmosphere	Start another high side compressor.
Oil differential pressure 30 to 40 psig	LOPCO @ 25 psig differential	Compressor shuts down	Clean strainer, change oil filter, check oil level, check oil pump
Oil temperature 110 to 140°F	HOTCO @ 150°F	Compressor shuts down	Open hand valve(s) for liquid cooling, check thermal expansion valve. Check receiver liquid levels.
Discharge temp. 110 to 140°F	HDTCO @ 150°F	Compressor shuts down	Open hand valve(s) for liquid cooling, check thermal expansion valve. Check receiver liquid levels.

Date printed helps avoid use of out-dated procedures

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RSW SYSTEM
(REFRIGERATED SEA-WATER)

OPERATING PROCEDURES

Initial Startup

1. Check all possible areas on the RSW system for leaks. When none are found continue. If leaks are found, repair them before continuing.
2. Open sea-water valves
3. Check that the suction and liquid feed valves are open (as they always should be).
4. Check that all solenoids and BPR are in Auto.
5. Turn on the control power.
6. You should hear the pressure in the RSW vessel drop.
7. It is up and running. Come back in a half hour to an hour later and make sure the temperature is coming down and there are no red lights on the control panel. The bottom float on the float column will operate the liquid solenoid. The top float is a high level float.

Normal Startup

1. Check that the suction and liquid feed valves are open (as they always should be).
2. Turn on the control power. Blue and both green lights should come on if sea-water is flowing to production. The blue light will turn on and off with the level of liquid in the surge tank (operating level float switch).
3. You should hear the pressure in the RSW vessel drop when production is flowing sea-water.
4. It is up and running. Come back in a half hour to an hour later and make sure the temperature is coming down and there are no unusual conditions. The bottom float on the float column will operate the liquid solenoid (Blue Light). The top float is a high level float. There are two temperature switches and one flow switch that will control suction pressure.

Photos help operator identify equipment and avoid error

Normal Operation

1. Check for sign of heavy ice developing on the surge tank. Ice developing on underside is normal. If top of surge tank is iced up you need to check BPR for correct operation and setting. There should be a lot of condensation building, resembling sweat on top of surge tank. Then you know you are right on the line of freezing; this is a good thing.
2. Check that the float is opening and closing with the demand of liquid to the surge tank.

RSW SYSTEM
(REFRIGERATED SEA-WATER)

SETTING CONTROLS

Parameters

NUMBER OF OPERATORS REQUIRED: 1

NECESSARY TOOLS: 6" Adjustable Wrench, Refrigeration Wrench, Small Screw Driver

HAZARDS: Ammonia leak at packing

MINIMUM PPE REQUIRED: Goggles

Identify special hazards and PPE

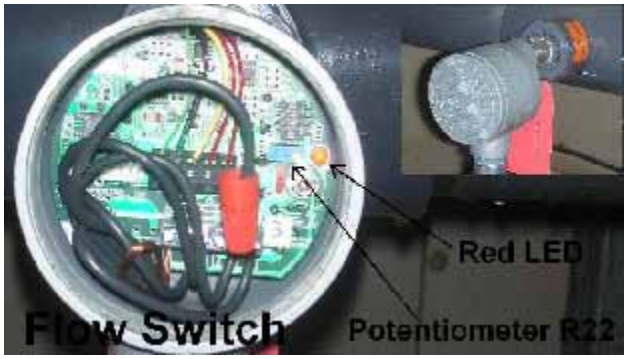
Procedures

1. Turn on system using Normal Startup.
2. Ensure that there is no sea-water flow and that coil on BPR is OFF.
3. Set higher pressure setting to 50 to 55 psig. Refer to the setting backpressure regulator SOP.
4. Turn on sea-water flow to fish bins and ensure coil on BPR is ON.
5. Set lower pressure setting to 43 to 47 psig. Refer to the setting backpressure regulator SOP.
6. Set temperature switches by having sea-water at normal temperature and flow between 28-34 deg F. Turn switch adjuster clockwise (CW) until it activates (Coil on BPR turns OFF). Then turn counter-clockwise (CCW) slowly until BPR coil turns ON. This will set the switch just below your current sea-water temperature. Watch for the switch activating too soon or set to close too normal temperature.
7. Set the flow switch by having the sea-water at the minimum flow you want through the heat exchanger. Adjust the potentiometer (R22 on the wiring diagram) on the circuit board until the red LED changes state. Then turn it until the unit LED is ON and then one more turn. This will set the minimum flow switch just below current flow of sea-water. Refer to FX Series Flow Switch Manual (FX2100-1) for more details on setting flow switch.
8. Return system to normal condition.

Deviations/Consequences

1. If the pressure (temperature) is too high, the tank will not be operating at 100% capacity and it will cut down on overall production efficiency.

2. If the pressure (temperature) is too low the plate and frame chiller could and will freeze and if not noticed in time it could cause an ammonia release.



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Industry standards should be included in Safety Information

RSW SYSTEM
(REFRIGERATED SEA-WATER)

MAINTENANCE

Annual inspections and all repairs should be recorded in the engine room log. These recommendations are derived from OEM recommendations and IIAR Bulletin 110 6.4.

DAILY

Every four hours when in operation visually inspect for leaks and proper temperature.

WEEKLY

OTHER: Back flush sea-water side of both heat exchangers when in use.

INSPECTION: Inspect the system for leaks, normal pressure, and frost on piping/valves that should not be frosted.
Examine external appearance of vessel and/or insulation for any departure from normal. Arrange repairs as necessary.

ANNUALLY

INSPECTION: Examination of external condition of vessels/piping and/or insulation by Refrigeration Operator. Apply paint and/or repair insulation as necessary.

TESTING: Test float, temperate and flow switches are correctly operating

CLEANING: Clean water side of plate and frame.

OTHER: Remove oil from surge tank and both heat exchangers.

Five Years Change SRV's

Twenty Years Change Gaskets on plate and frame heat exchangers.

All maintenance procedures should be documented and approved

Approved By:	Date:	Initials:
Asst. Chief Engineer		
Refrigeration Head Operator		

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Plan to attend the FREE EPA Risk Management Training Day in your area

RISK MANAGEMENT PROGRAM (RMP) Training

Seattle, Washington
November 16, 2011

Additional information can be found on EPA Region 10's RMP Website: Training Information

Where Do I Go For More Information?

http://www.epa.gov/emergencies/rmp will be updated as new information becomes available.

EPA maintains numerous listservs to keep the public, state and local officials, and industry up to date, including several that pertain to emergency management. You can sign up for our list serve to receive periodic updates: https://lists.epa.gov/read/all_forums/subscribe?name=callcenter_oswer

EPA Region 10 RMP Coordinator:
Javier Morales 206-553-1255

EPA Region 10 RMP Website:
http://yosemite.epa.gov/R10/CLEANUP.NSF/sites/rmp

Superfund, TRI, EPCRA, RMP & Oil Information Center - The Information Center can also answer questions related to Clean Air Act section 112(r) and RMP reporting requirements.
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Risk Management Program (RMP) Reporting Center - The Reporting Center can answer questions about software or installation problems.
The RMP Reporting Center is available from 8:00 a.m. to 4:30 p.m., Monday through Friday, for questions on the Risk Management Plan program.
(703) 227-7650 (phone)
RMPRC@epa.cdx.net (e-mail)

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