

**The Dow Chemical Company - Louisiana Operations Emergency Plan
Section D (Freeze Plan)**

FREEZE PLAN

General

Purpose

To provide guidance and recommendations in preparing for a severe freeze to:

1. Assure safety of all personnel
2. Prevent environmental incidents
3. Minimize plant and equipment damage

Definitions

Level I Freeze

Temperature is forecast to stay above 20 degrees F. at night with a wind chill factor above 0 degrees F., and rise above 32 degrees F. the next day.

Level II Freeze

Temperature is forecast to drop below 20 degrees F. with a wind chill factor of -10 degrees F., and will not rise above 32 degrees F. the next day.

Responsibilities

SEM

Level I:

1. Maintain contact with the site. Check with Emergency Services & Security (ES&S) on appropriate announcements.
2. Closely follow weather forecasts.

Level II:

1. Be on site continuously.
2. Monitor utilities (condensate, nitrogen, air, process water system and fuel gas) through contact with the Utilities Department.
3. Assure appropriate manning of plants. Initiate reminder to plants about adding additional personnel to handle a multi-day event.
4. Request that Production Planning do a utility balance as plants shut down and cut back.
5. Refer to Production Planning Notebook in the EOC which deals with load shedding, condensate usage, fuel gas curtailment, etc.
6. Monitor Brine Production status.

**Emergency
Services & Security**

As soon as predictions for freezing weather begin, the Emergency Services & Security Site Leader will bring together the following department heads to assess and monitor the situation.

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(ES&S)

- Maintenance/Construction
- Production Planning
- SEMs
- Safety
- Environmental

Emergency Services & Security will monitor weather conditions and make all appropriate announcements. The announcements will include:

- Present weather conditions
- Forecast weather conditions
- Division freeze status (Level 1 or Level 2)

Emergency Services & Security will have the responsibility of keeping all division personnel, including Brine Production and the Learning Center, informed of all pertinent freeze information. In addition to all-area page announcements this will include:

- Updates on the Dow Community Hotline
- FAX copies of weather forecast to Brine Production, Learning Center, Dow Switchboard Operators, and appropriate Louisiana Operations Leadership.

Plant

Each plant must have a Freeze Plan developed and updated annually to cover Level I and Level II freeze. It is the responsibility of the process leader to see that this plan be implemented as conditions dictate. Plants will stay up-to-date on weather conditions during Level I conditions. Decisions during Level II conditions have to be based on safety, environmental, loss potential, and ability to operate or shut down.

**Maintenance
Department**

Using the established Maintenance/Construction Crisis Management callout procedure, Gate 1 shall make the Resource Center Manager aware that the division is going into a Level 2 Freeze Status. The Resource Center Manager shall contact the following who (or their designee) will report to the site as soon as possible and begin putting into place these emergency measures:

- Maintenance/Construction Manager
- Mechanical Contract Focal Point
- I&E Contract Focal Point
- Field Services Contract Focal Point

Contract Focal Points will initially do the following:

- Establish for each of the three disciplines a procedure for managing manpower request for the duration of the emergency. This information, complete with appropriate names and phone/radio numbers, will be communicated to the Area Maintenance Superintendents and to Gate 1.
- Contact the appropriate Dow or contract supervision to establish 24 hour onsite coverage at the minimum levels defined below.
- Set up a central location for standby crews.
- Attend status and planning meetings at the EOC and based on decision made there, prioritize the use of resources. The prioritization information will be communicated to each of the dispatch personnel.

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- Maintain close contact with the dispatcher and the Area Maintenance functions to ensure that needs are being met.
- Determine, with the help of the designated dispatcher, when standby coverage needs to be increased, decreased, or discontinued.
- Discipline specific requirements:

I&E - Establish a 24-hour standby crew consisting of:

- * 3 Instrument technicians
- * 3 Electricians

Mechanical - Establish a 24-hour standby crew consisting of:

- * 1 Equipment operator
- * 2 Insulators
- * 1 Scaffold crew
- * 4 Pipefitters
- * 1 Welder
- * 1 Supervisor
- * Arrange for a leak repair team to be on-site, initially on days.

Field Services - Establish a 24-hour standby crew consisting of:

- * 3 Equipment operators
- * 1 Laborer

Establish 24-hour coverage from the HVAC shop to monitor freeze precautions in Blocks 23, 33, and 13.

Have road sand available for icing conditions.

Store the following equipment inside for emergency use:

1 - 1600 CFM air compressor	B-3002
1 - 40' aerial lift	B-3301
1 - 60' aerial lift	B-3001
1 - backup fuel truck	B-3301
2 - 15 ton Hyd Cranes	B-3002
2 - 45 ton Hyd Cranes	B-4108
2 - 200 amp welding machines	B-3002
2 - forklifts	B-3002
1 - rubber-tire loader	B-3002

Have division bulk fuel tanks and trucks at maximum level. Contact fuel supplier for emergency backup supply.

Contact Inventory Management to arrange for additional supplies (plumbing, water coolers). Tool Room should arrange for delivery of 10-12 portable heaters.

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Safety Systems (Level II Freeze)

Personnel Protection

1. Safety Showers and Eyewash - closed loop systems should be adequately protected to operate through these conditions. If not protected, systems should be drained and blown out. If safety shower and eyewash systems are taken out of service, adequate means to wash someone off has to be provided.

If safety shower and eyewash stations cannot be made freeze-proof:

- maintain sufficient portable eyewash bottles or stations
- drain and block station out of system
- consider plant a monogoggle area
- provide a means to shower for decontamination such as a process water hose.

2. Adequate supplies of skull caps and gloves should be provided.

Fire Protection

All fire water stations should be protected in such a fashion as to being available when needed. Special consideration should be given to stations off the ground. If a station off the ground is drained, communications must occur at each shift relief.

Active systems shall have bleeds or shall be insulated and heat traced. Bleeds shall be kept to a minimum to avoid problems with plant-wide capacity.

Sprinkler systems shall have auto freeze valves that begin opening at 42 deg F. and are fully open at 35 deg F. (water temperature)

Spill Protection

Adequate provisions in the decision making process should be provided for in the plant freeze plan in the event systems become inoperable and the potential for a spill has increased.

System Protection

Introduction

Checklist - included as a part of the plant freeze plan will be a checklist by area of the plant. Adequate provisions should be stated in the checklist for all equipment needing protection. The checklist should differentiate between a Level I and Level II freeze.

River Water and Potable Water Systems

Have bleeds on active systems and bleed to establish minimal flow to keep from freezing.

Drain non-flowing systems. Survey lines for low point traps and provide adequate low point drains.

Drain all inactive exchangers, including water-cooled air conditioner condensers.

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**Waste Water and
Sewer Systems**

Unless water to building and facilities are buried or freeze-protected, loss of service could occur, particularly with potable water systems. Preventive measures of shutting system in and draining should be strongly considered to minimize damage.

Process facilities which depend on water for safe operation should freeze-protect all lines. In addition unit emergency plan and operating discipline shall make provisions for a complete interruption in single source water supplies.

Protect and/or drain piping and equipment subject to freezing. Buried sewers and waste water canals and ditches should not be significantly affected.

**Compressed Air
Systems**

Air system dew point should be maintained at its lowest possible level to minimize the solenoid and valve problems associated with a severe freeze.

Do not tie portable air compressors into the air system without proper coolers, separators, filters, and dryers.

Check all moisture traps on compressors, separators, inter-coolers, for proper operations. Traps should be bypassed during freezing weather and allowed to bleed. All drain lines should be insulated.

Check all low point drains in the system periodically, but DO NOT leave valves and drains open.

Heat trace and insulate all critical air and water transmitters.

Enclose air stations to block freezing winds and retain heat from equipment. Use heaters (portable or fixed) to elevate building temperature.

Perform PPM of compressors, dryers, filters, and other air equipment to ensure optimum performance before the winter season.

**Steam and
Condensate
Systems**

Due to past major capacity problems, routine draining of condensate and venting of steam systems for freeze protection is not acceptable and should be minimized. Lines should either be isolated, drained, and blown dry or adequately freeze protected. Practices in the past that should be avoided are:

1. Steam utility drops venting to atmosphere.
2. "Dripping" condensate from drains on uninsulated condensate headers for freeze protection.
3. Steam tracing that is not trapped but rather venting continuously to atmosphere.
4. Shut down plants continuing to take "warm" condensate from the distribution system and using it as "once through" heating medium to prevent freeze-up.
5. Use of condensate in cooling towers should be reconsidered.

Review design aids and upgrade heat tracing systems (both electrical and steam) to Engineering Standards/Design Aids.

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	Freeze protect condensate return lines all the way to the distribution header so that freezing problems in trap return lines, etc., do not result in the inability to return condensate to utilities. Drip legs, steam traps, and tail lines must be included to be freeze protected. Raise priority to repair water leaks (condensate, river water, fire water), after lines begin to thaw. Broken valves, fittings, etc., increase demand markedly. Any unoccupied building which is supplied condensate should consider isolating that building from the supply header, especially buildings made vacant by release of non-essential personnel.
Cooling Towers	Shut off cooling tower fans as required to prevent accumulation of ice in louvers, fill material and drift eliminators. Consideration should be given to the installation of a bypass from the return header to the basin sized for minimum circulation during periods of low/no heat load.
Utility Block and Bleed Systems	Study installations in which isolation valves create a situation where water containing lines are dead-ended with no flow. Services to be examined include river water, condensate, potable water, fuel gas, wet air, bio pond water, fire water, sanitary sewer lines, etc. Branches without flow on the utility side of the block isolation valve must be freeze protected back to the utility header. This may include heat tracing, insulation, or both.
Fuel Gas Systems	Be certain that fuel gas systems that may contain water are adequately freeze protected. Include drip legs, knockout pots, drain lines, level bridges, and filter media. Consider monitoring pressure drop across knockout/filter pots.
Working Conditions	A. Potable Water - in the event potable water is lost, alternatives for drinking, washing, and rest rooms should be developed. B. Ice Structure - plans to prevent ice buildup in structure and walkways should be developed. Provisions should be made to have bleeds drain to a trench system. If ice formation does occur, access should be off-limits in those areas. C. Icy Roads - should icy road conditions occur in the surrounding area, plans to minimize folks to those conditions have to be developed. Food and sleeping facilities may need to be provided for those remaining in the plant. Equipment yard will maintain a supply of salt and sand to treat road surfaces.