4.10.2 Sustained Winds of 39 – 44 miles per hour.

4.10.3 Heavy rains that distort visibility.

4.11 Phase III ***(also refer to Section 7.1)***

4.11.1 Lightning: please see attachment 2 for the phase distances of the Formosa Plant Boundary

4.11.2 Apparent conditions which directly approach the Formosa Plant Boundaries such as:

4.11.2.1 High winds (45 mph or greater) which blow large debris and materials.
4.11.2.2 Tornado or Tornado Warning issued for Point Comfort and/or the immediate surrounding area.

4.12 Predetermined Boundary Location for Weather Phases Rings: center point

The center location for the warning rings is GPS coordinates to N 28.682, W 96.543. This location provides equal distance coverage for EG-2 and the J7 Rail Yard along with the main facility site. The location is due south of VCM, near SH 35.

A separate set of weather phase rings will be set for the Lolita Rail Operations/LLPC Warehouse area. This location provides equal distance coverage for the Lolita Rail Operations, Railcar Repair Shop and LLPC Warehouse. The center location is the Lolita Railyard Field Office.

4.13 Tornado Warning

When an advisory for a specific area has been issued that serves as a warning to the public that a tornado has been spotted or is shown on radar.

4.14 Weather Phase III, Essential and/or Emergency Job Tasks

Activities/job tasks, if not performed in a timely fashion, may create a greater hazard than short-time exposure to the weather conditions outside.

5.0 RESPONSIBILITIES

5.1 Operations Manager / Department Director:

Each Operations Manager / Department Director or their designee is responsible to ensure strict enforcement and compliance with all terms and conditions of this procedure including but not limited to the following actions:

5.1.1 Convey all weather phases to all affected employees, contractors, pick-up/delivery personnel and visitors.

5.1.2 All information pertinent to the weather phase should be noted in the Security Dispatch logbook.

5.1.3 Regular inspections will be made by appropriate department personnel during the weather phase to insure compliance with this procedure. Should discrepancies be found, the activity will cease until all weather phases are lifted.

5.1.4 Immediately report to the EH&S Department any changes in the weather that may create a hazard. Stop all work activity if necessary.

5.1.5 Properly train all employees upon their initial work assignment in the appropriate techniques and personal protective equipment required to perform their work assignment safely during all weather phases.

5.1.6 Ensure that an assessment is made to identify the essential and/or emergency job tasks to be performed by an employee under their responsibility during a Weather Phase III or worst weather conditions.

5.1.7 Prepare and maintain an updated list using Attachment 12.1 (Titled “Weather Phase III, Essential and/or Emergency Job Tasks”) of these essential and/or emergency job tasks and make available to all employees under their responsibility.

5.1.8 Communicate and train all personnel under their responsibility on the list of essential and/or emergency job tasks that are required outside during a Weather Phase III. All training records will be filed in the appropriate department.

5.2 Shift Safety Coordinators or Their Designee

Shift Safety Coordinators or their Designee are responsible for monitoring the weather conditions, determining when a Weather Phase should be issued or lifted and ensure prompt and adequate communication is given to all departments.

5.3 All Employees, Contractors, Pick-up/Delivery Personnel and Visitors:

All Employees, Contractors, Pick-up/Delivery Personnel and Visitors are expected to fully comply with this procedure. FPC-TX employees failing to comply with this procedure will be considered in violation of a Health and Safety (H&S) Policy. Violations may result in disciplinary action according to the Human Resources Manual Procedure 7. All others may receive corrective action according to H&S Procedure 2 "Access Restriction" including up to permanent access restriction.

6.0 KEY POINTS

6.1 Being in close proximity to the Gulf of Mexico, weather conditions are prone to rapid change. To provide reasonable employee protection from injuries caused by weather conditions, FPC-TX has created and expects full implementation of this Weather Phase Procedure.

6.2 Tropical Weather conditions are seasonal and have the potential for creating severe weather conditions. Therefore, Tropical Weather conditions are covered separately in the FPC-TX Tropical Weather Plan. The Weather Phase procedure must be followed at all times, even during tropical weather.

6.3 Be aware that while **lightning does not always strike the highest object**, the greatest percentages or likelihood for strikes reflect this condition.

6.4 High winds would render lift equipment inoperable per OSHA & ANSI regulations, and adversely affect employees who could be exposed to falls on high structures.

7.0 GUIDELINES

The following guidelines shall be used to comply with this procedure.

7.1 Weather conditions to be used by EH&S when determining if and when to issue a **"WEATHER PHASE"** are as follows:

7.1.1 Lightning in close proximity to the Formosa Plant Boundaries

To adequately protect employees from electrical shock associated with lightning, the following items will be taken into consideration:

7.1.1.1 **Distance of lightning from plant.** (Count the number of seconds between when lightning is sighted and until thunder is heard. Distance is estimated at 5 seconds per mile.) *This method is an approximate only. Actual conditions including humidity, wind velocity and direction must be accounted for. For use at this facility,*

we have chosen a number, which should suffice for most applications.

Discussion with the National Weather Bureau has given us the following information.

Lightning may strike many miles (10 to15 miles) ahead of the actual frontal system. The sky above the lightning strike zone at this time may be clear.

7.1.1 **The actual storm location/ Wind direction** (when definable) must be considered to warrant the Weather Phases. A storm containing lightning, heavy wind, rain etc., may pass close enough to the plant to warrant close attention, yet not require establishing a Weather Phase.

7.1.2 **Data from the National Weather Bureau** will assist in the determination of actual direction of travel, intensity, etc.

7.1.3 **Winds exceeding 28 miles per hour**

7.1.3.1 Affects the use of lifting equipment with regard to material stability and the ability of the worker to control the lift load.

7.1.3.2 Affects the stability of workers on top of structures.

7.1.3.3 Affects the visibility due to dust or debris, which could be dangerous to those persons exposed to a potential fall or flying debris.

7.1.4 **Severe or heavy rainfall**, which hampers visibility during equipment operation. In most cases, this situation does not last long.

7.1.5 **Flooding** which makes plant access roads impassable. Flooding may hamper the ability to determine the location of ditches, road crossings, and intersections.

7.1.6 **Freezing Rain, Hail, Sleet, Ice and Snow** which affects stability of employees or equipment.

7.2 Safe Work Permit Requirements

7.2.1 Should a Weather Phase be issued by EH&S that requires work stoppage that is covered by a Safe Work Permitted activity (such as but not limited to Hot Work), the permit becomes invalid. Re-validation by inspection and in accordance with the applicable Safe Work Permit Procedure is allowed only after EH&S

downgrades the Weather Phase to a level that does not restrict the permitted activity from occurring.

7.3 Communication of Weather Phases

7.3.1 The Shift Safety Coordinator on duty or their designee will issue An All-Call from the EOC Dispatch Office to notify FPC-TX employees of the different Phases. (The EOC Dispatcher has capability of overriding all radio traffic on all channels simultaneously).

7.3.2 "All Clear" notification advises employees when conditions are clear for resuming work are handled in the same manner. The Shift Safety Coordinator on duty or their designee makes All Clear notifications from the EOC/Dispatch Office. The time from the last lightning strike inside the weather phase boundary until the "all clear" is sounded will be 20 minutes. (The EOC/Dispatcher has capability of overriding all radio traffic on all channels simultaneously).

7.3.3 Weather Phase status will also be noted on the Emergency Notification System (ENS) screens in each control room. The Shift Safety Coordinator on duty or their designee sends the Weather Phase status using the ENS Node located in the EOC/Dispatch.

7.3.4 Weather Phases may vary in length, from a matter of a few minutes to several days in the case of a hurricane. The EH&S Department is cognizant of the necessity for production. Employees will be allowed to return to work as soon as possible. Work stoppage, due to weather conditions, should be considered a **TEMPORARY CEASE OF ACTIVITIES**, unless weather conditions worsen or do not quickly subside.

7.3.5 The issuing of the Weather Phases for the Main Facility will be unchanged by the addition of the Lolita area weather phase boundaries. The main facility will still receive notification over the ENS console and the plant radio system for any weather phase changes. Weather phases called for the Lolita Area will only go out over radio groups for the departments working in that area, not on the ENS console.

7.4 Weather Phase Requirements

[redacted]

7.4.2 Phase II

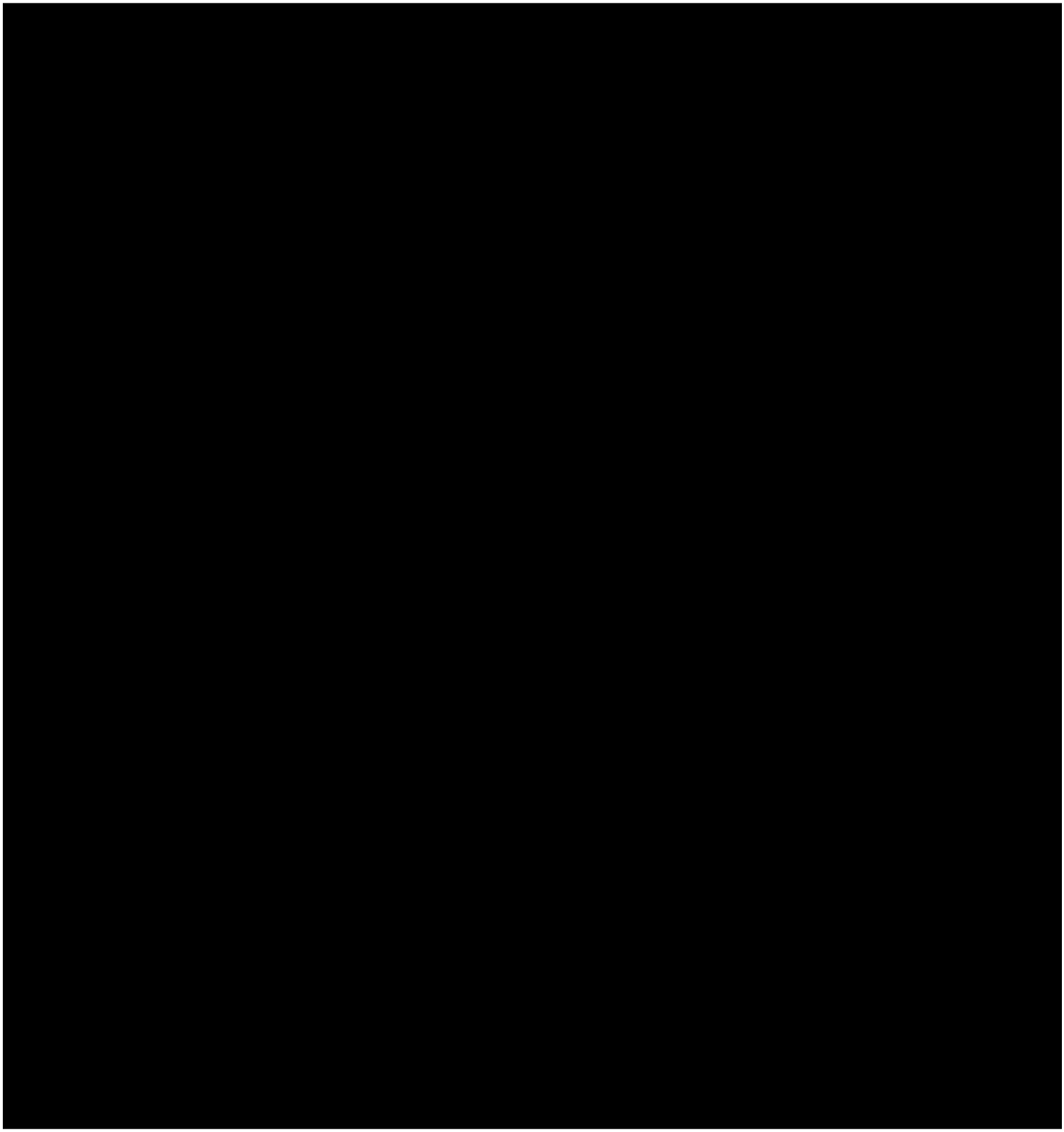
[redacted]

7.4.3 Phase III

[redacted]

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

Revision Number: 4



[redacted]

7.5 General Weather Information / Tips

7.5.1 Telephone use during severe thunderstorms should be for emergencies only. Telephone lines are capable of carrying large electrical charges.

7.5.2 Consideration should be given to the fact that surge protectors **will not** protect computers, copy machines, fax machines etc., from lightning strikes, even if the equipment is turned off. It is, therefore, recommended that:

7.5.2.1 Data back-ups should be made on a regular basis.

7.5.2.2 The above-mentioned equipment should be **unplugged** during **severe** thunderstorm conditions.

8.0 Training Requirements

8.1 All employees shall be trained within 30 days of their initial hire date according to the Master Training Plan.

8.2 Refresher training should be taken when procedure is revised and training documented.

9.0 FLOW CHARTS

9.1 Not Applicable

10.0 REFERENCES

10.1 Tropical Weather Plan
10.2 ANSI 92.22 (6.8.2 Weather Considerations) Safe Use of a Mobile Elevating Work Platform.

11.0 RECORD RETENTION PERIOD

11.1 Training records should be retained according the Master Training Plan or as specified in the TQM Manual.

12.0 ATTACHMENTS

12.1 “Weather Phase III, Essential and/or Emergency Job Tasks”
12.2 Weather Phase Distance Boundary Maps for the Main Facility
12.3 Weather Phase Distance Boundary Maps for the Lolita Area

ATTACHMENT 1

"Weather Phase III, Essential and/or Emergency Job Tasks"

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

Revision Number: 4

"WEATHER PHASE III, ESSENTIAL AND/OR EMERGENCY JOB TASKS"

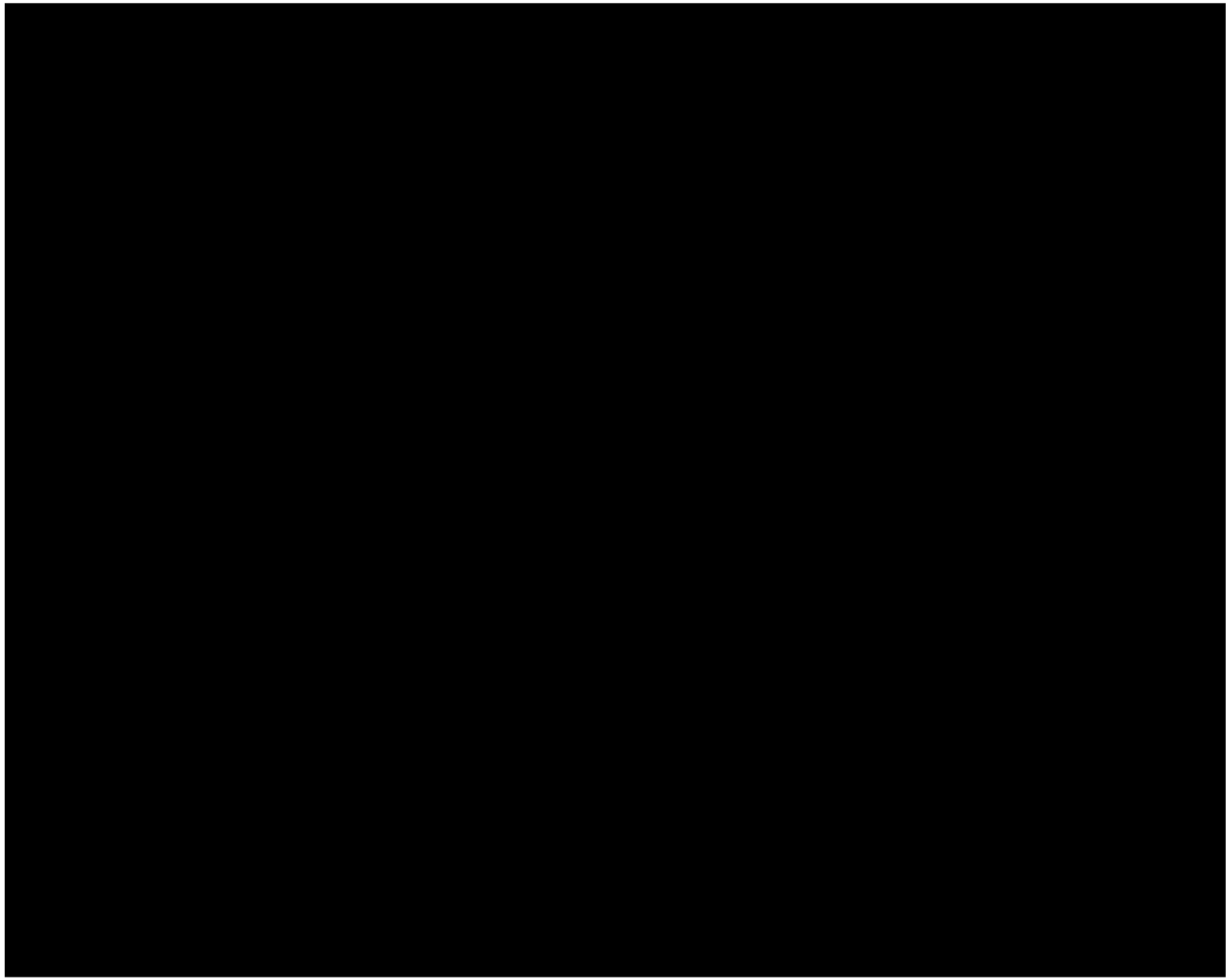
[redacted]

Attachment 2

Weather Phase Distance Boundary Maps for the Main Facility

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

Revision Number: 4



FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

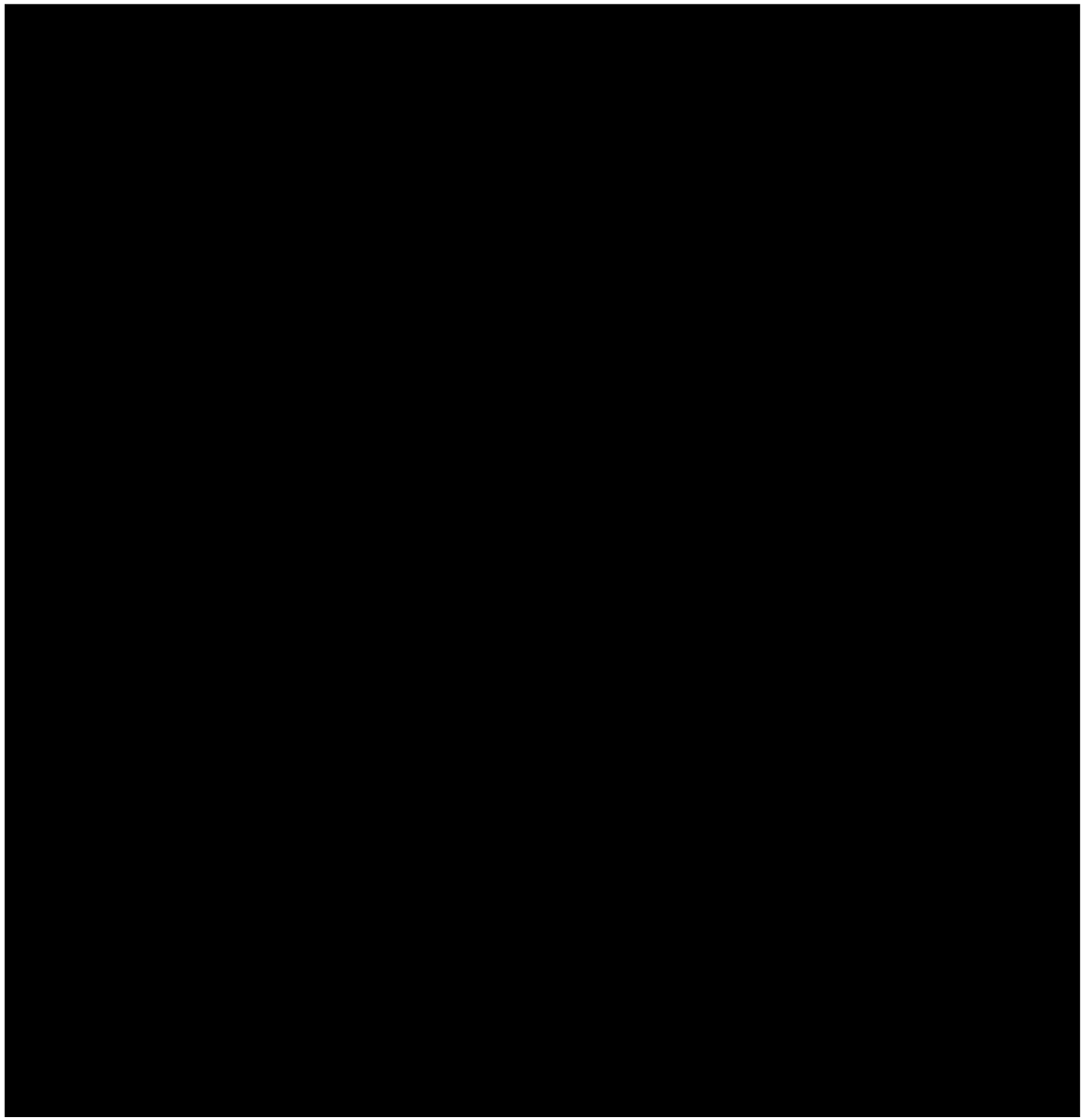
Revision Number: 4

Attachment 3

Weather Phase Distance Boundary Maps for the Lolita Area

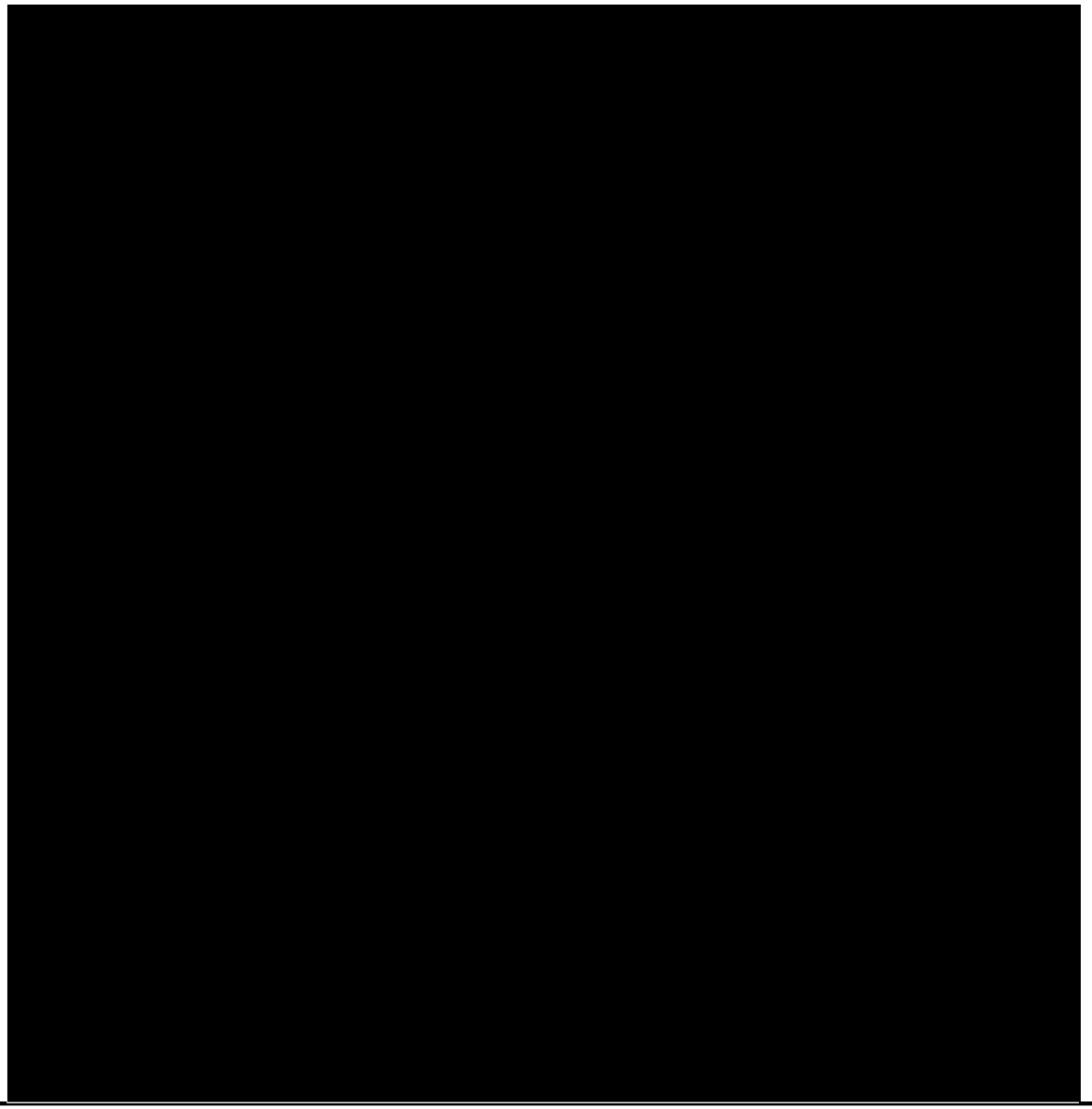
FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

Revision Number: 4



FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 26
WEATHER PHASES

Revision Number: 4



Emergency Operations Plan

6.0 Annexes

Formosa Utility Venture, Ltd.,
&
Neumin Production Company

March 2023

Emergency Operations Plan

6.1 Weather Emergency Annex

Formosa Utility Venture, Ltd.,
&
Neumin Production Company

March 2023

Table of Contents

1.0 Purpose/Scope

1.1 The purpose of this procedure is to prepare and protect the Power Generation of the Formosa Texas Complex, located along the Gulf Coast, for the events of Freezing Temperatures and/or a Severe Weather Storm to ensure the safe and reliable operation of the Units. This procedure covers NERC Standard EOP-011 for cold weather preparedness. The plant configuration is [redacted].

2.0 Organizations Affected

2.1 COGEN

2.2 DEMIN

2.3 PC PLANT

2.4 UT3

2.5 FHC

3.0 Responsibilities/Duties

3.1 All employees are responsible for the implementation of the Winter Weatherization Plan.

4.0 Definitions

ERCOT - Electric Reliability Council of Texas

FUV - Formosa Utility Venture, Ltd

NERC - North American Eletric Reliability Corporation

PUCT - Public Utility Commission of Texas

5.0 Safety and Health Considerations

N/A

6.0 Tools Required

Winterization Critical Instrument List

Winterized Instruments

7.0 Procedure

7.1 Annually - By October 15th

7.1.1 Winter Weatherization Preparation Meeting to include the following:

- Review of the current Winter Weatherization Plans
- Follow up on progress of any improvements based on experiences of the past Winter
- Review of the capability & availability of units
- Review of any fuel supply and inventory concerns
- Review environmental constraints
- Reminder to perform maintenance & inspections on equipment

7.2 Monthly - By 7th of each Month (November through March)

7.2.1 Perform route check to verify the integrity of all Heat Tracing Equipment.

7.2.2 Confirm that sufficient wind-break materials are in-stock and available for use.

7.2.3 Confirm that sufficient steam hoses are in-stock and available for use.

7.2.4 Confirm that all portable heaters are available for use and sufficient fuel is available.

7.2.5 COGEN

.1 Refer to the HRSG Area Procedures Section 4.7.5 - Cogen Freeze Protection Procedure.

7.2.6 DEMIN

.1 Refer to the Demin Area Procedures Section W.4.5.2 - Demin Freeze Protection Procedure.

7.2.7 PC PLANT

.1 Refer to the PC Plant Procedures Section U.4.9.3 - Freeze Protection Procedure.

7.2.8 UT3

.1 Refer to the UT3 Winter Weatherization Plan FVUU3A0004

.2 Refer to the UT3 Freeze Protection Checklist FVUU3A0013

7.3 When Forecasted Temperature is below 35°F (including Wind Chill)

7.3.1 Perform route check to verify the integrity of all Heat Tracing Equipment.

7.3.2 Stage wind break material near critical equipment and instruments.

7.3.3 Stage steam hoses near critical equipment and instruments.

7.3.4 COGEN

.1 Refer to the HRSG Area Procedures Section 4.7.5 - Cogen Freeze Protection Procedure.

7.3.5 DEMIN

.1 Refer to the Demin Area Procedures Section W.4.5.2 - Demin Freeze Protection Procedure.

7.3.6 PC PLANT

.1 Refer to the PC Plant Procedures Section U.4.9.3 - Freeze Protection Procedure.

7.3.7 UT3

.1 Refer to the UT3 Winter Weatherization Plan FVUU3A0004

.2 Refer to the UT3 Freeze Protection Checklist FVUU3A0013

7.4 When Forecasts indicate a Severe Weather Storm (Ice/Snow) is likely

7.4.1 Perform route check to verify the integrity of all Heat Tracing Equipment.

7.4.2 Stage wind break material near critical equipment and instruments.

7.4.3 Stage steam hoses near critical equipment and instruments.

7.4.4 If Severe Weather could prevent personel from entering/exiting the plant for an extended period of time, perform the following.

.1 Gather and store sufficient food/drinks for personel to consume during the storm.

.2 Make sleeping arrangements at the plant for personel during the storm.

.3 Review whether additional personel will be required to allow the plant to continue to run during the storm.

7.5 When actual temperature is below 30°F (including Wind Chill)

7.5.1 COGEN

.1 Refer to the HRSG Area Procedures Section 4.7.5 - Cogen Freeze Protection Procedure.

7.5.2 DEMIN

.1 Refer to the Demin Area Procedures Section W.4.5.2 - Demin Freeze Protection Procedure.

7.5.3 PC PLANT

.1 Refer to the PC Plant Procedures Section U.4.9.3 - Freeze Protection Procedure.

7.5.4 UT3

.1 Refer to the UT3 Winter Weatherization Plan FVUU3A0004

.2 Refer to the UT3 Freeze Protection Checklist FVUU3A0013

7.6 During Below Freezing Temperatures and Severe Weather Storms

7.6.1 Perform route check to verify Wind Break integrity.

7.6.2 Perform route check to verify Portable Heater operation.

7.6.3 Perform route check to verify Heat Tracing operation.

7.6.4 During route checks confirm that no other areas require additional freeze protection.

.1 If an area requires additional protection, notify the Shift Supervisor to take action to improve the freeze protection in the affected area.

7.7 Annually - By March 30th

7.7.1 Winter Weatherization Post Meeting to review any problems encountered during the past Winter and, if necessary, propose improvements to be completed before next Winter.

7.8 Generating Units Minimum Historical Operating Temperature

7.9 Annual Reporting Documents

7.9.1 ERCOT Nodal Protocols Section 22 Attachment O: Declaration of Completion of Generation Resource Winter Weatherization Preparation

.1 Submission of this form is to meet the following:

- No earlier than November 1 and no later than December 1 of each year

7.10 Revisions to this procedure

7.10.1 In the event of a revision of this procedure, FUV must provide a copy to ERCOT.

Per ERCOT Nodal Protocols Section 3.21(2), submission of this procedure must meet the following:

- Submit by June 1 if updated made between November 1 and April 30
- Submit by December 1 if updated made between May 1 and October 31.

8.0 Training Requirements

8.1 Initial Training will be given to new employees of the affected departments upon hiring and Annual Refresher Training will be given to all employees of the affected departments. Utility Operations are responsible for assigning the training.

9.0 Record Retention

9.1 Records regarding the Winter Weatherization Plan should be kept for a minimum of 6 years.

10.0 References

10.1 FVUU-P124, Section 4.7.5, Cogen Freeze Protection Procedure

10.2 FVUU-P319, Section W.4.5.2, Demin Freeze Protection Procedure

10.3 FVUU-P526, Section 4.9.3., Freeze Protection Procedure (for PC Plant)

10.4 FVUU3A0004, UT3 Winter Weatherization Plan

10.5 FVUU3A0013, UT3 Freeze Protection Checklist

10.6 NERC Standard EOP-011

11.0 Document History

Revision	Date	Author	Description
3	06/20/2022	Nicolas Brito	Updated for NERC Standard EOP-011-2 for Generator Owner and Generator Operator

Summary of Revisions

Formosa Plastics

FREEZE PROTECTION PROCEDURE

Document Code: FVUU-P526 U.4.9.3-GP Revision: 3 Effective Date: 03/02/2022 Original Issue Date: 01/01/1997	**General Procedure**	Formosa Utilities PC Utilities Other

Table of Contents

1.0 Purpose/Scope

Purpose

This operation procedure is used as a guideline for implementing freeze protection measures for the PC Plant Utility Area. A number of different measures are outlined in this procedure to prevent equipment damage due to freezing weather conditions. Safety and Environmental risks can also be minimized by proper freeze protection.

Responsibility

The PC Plant Utility Operator is responsible for the execution of this procedure and completing the reporting requirements for the Industrial Water, Demineralized Water, Package Boiler, and Cogen Areas. The Water Treatment Field Operator is responsible for the execution of this procedure for the Raw Water Pond Area. The Day/Relief Operator is available for assistance as assigned by supervision.

2.0 Performance Frequency

There are three phases to this procedure. The first is *Annual Freeze Protection Procedures* which should be implemented every year during the months of November through March. The second phase is *Imminent Freeze Procedures* which is in effect any time ambient temperatures are expected to drop below 35°F and down to 25°F. The third and final phase is the *Freezing Conditions Procedures* which are steps to be taken when the freezing weather starts. Supervision will indicate when the second and third phases should be started.

3.0 Safety and Health Considerations

3.1 SDS Reference

Refer to the SDS Equipment Cross Reference Guide for a listing of the chemicals used in the process equipment in this system. The Corporate SDS Database may be used to refer to properties of and hazards presented by these chemicals.

The Corporate Safe Handling Guidelines are a consolidated source of information on the hazards and protective equipment required to work with various chemicals used in the process or handled outside of the process. These guidelines also contain exposure limits and control measures to be taken if physical contact or airborne exposure occurs.

3.2 PPE Requirements

Below is a list of minimum personal protective equipment (PPE) required in all process areas:

- Approved Hard Hat
- Approved Safety Glasses with side shield
- Approved Hard Toe Footwear.
- Approved Appropriate Hand Protection
- Approved Hearing Protection
- Approved Flame Resistant Clothing

3.3 Cautionary Notes

The Cautionary Notes section is used for general safety cautionary notes, as well as special or unique hazards, relevant throughout the specific job task found in this procedure. N/A indicates that no unique or special hazards have been identified for inclusion in this section. Notes, Cautions, or Warnings relevant to specific sections or steps will be embedded within the procedure, in and around where the hazard is recognized during the specific job task.

3.3.1 It is important that the freeze protection measures be implemented in order to minimize the safety risk posed by freezing weather. Equipment which malfunctions due to freezing can lead to personnel injury or environmental releases as well as equipment damage.

3.3.2 All personnel working in the field should wear proper clothing for freezing weather conditions. In a sense extra thick clothing is a form of PPE for the cold environment.

3.3.3 All personnel should use extra caution when icy conditions are present to prevent slipping and falling. Be cautious in wet areas and when climbing ladders or stairs.

3.4 Safety Systems

3.5 Environmental

3.6 Other Considerations

The normal operating ranges are documented in the Log Sheets/Round sheets. The consequences of deviating from the normal operating ranges and the steps to avoid or correct deviations are documented in the Troubleshooting guidelines. The safe upper/lower limits and the health and safety hazards of exceeding the safe upper/lower limits are documented using Attachment 5 of the PSM/RMP Manual Procedure 02 and are part of the process safety information. This process safety information is located in the unit PSI manual.

4.0 Preconditions

5.0 Tools Required

1. Rolled plastic,
2. Cold weather clothing,
3. Tools - valve wrench, adjustable wrench, channel lock pliers,
4. Duct tape,
5. Rope,
6. Steam hoses and fittings.

6.0 Procedure

Method

Annual Freeze Protection Procedures.

1.0 On November 1st, write work orders to freeze protect instrumentation and turn with instrument checklist (attached) to Utility Maintenance Coordinator.

Consult with maintenance coordinator about wording of work orders.

U.4.9.3 Annual Freeze Protection Checklist

2.0 Complete Annual Freeze Protection Checklist and turn in to Area Engineer for review. The following items should be checked and ordered from the warehouse if supply is low:

Steam hoses (4 - total 200ft length)

Steam hose fittings (enough for all four hoses),

Plastic sheeting - 1 large roll,

Rope (2 - 50ft lengths).

Turn in Issue Requests for material to the shift supervisor.

3.0 Inspect all piping and equipment which is insulated and write work orders for missing insulation.

4.0 Turn on package boiler heat tracing and verify proper operation. Write work order to repair any problems found.

5.0 Turn on coagulant pump heat tracing and verify proper operation. Write work order to repair any problems found.

6.0 Check steam tracing at [redacted] Caustic Tank and [redacted] Caustic pumps. Write work order to repair any problems found.

Turn in work orders to the Utility Maintenance Coordinator.

Imminent Freeze Procedures

1.0 Use plastic sheeting, rope, and duct tape to setup a wind break on the north side of the Glegg Unit. Cut small flaps in the wind-break to keep it from acting as a sail.

2.0 Use plastic sheeting, rope, and duct tape to setup a wind break on the east side of the boiler chemical skid.

3.0 Check plant air utility drops and blow down to remove moisture.

4.0 Blowdown [redacted] sludge to CWTP extensively and then shutdown the [redacted] pumps. Flush blowdown line with water and then blow line with air to purge all water from line.

See area engineer about blowdown time length. Contact CWTP operator to determine when line has been blown clear.

5.0 Place both [redacted] in service.

6.0 Place all of the [redacted] pumps in service.

7.0 Place both of the [redacted] pumps in service.

8.0 Shutdown standby [redacted] pump(s) and drain casing.

9.0 Shutdown standby [redacted] pump and drain casing.

10.0 Regenerate sandfilters and then shutdown [redacted] and drain.

11.0 Shutdown [redacted] and drain.

12.0 Confirm that heat tracing on [redacted] Coagulant tank and [redacted] coagulant pumps is operating properly.

13.0 Confirm that heater blocks on the [redacted] Diesel Fire Water Engines are operating properly.

14.0 Confirm that adequate diesel fuel is available [redacted].

15.0 Fill [redacted] Bulk Caustic Storage Tank.

16.0 Order HCL for [redacted] Bulk Acid Tank if level is low [redacted].

17.0 Confirm that heat tracing for the Package Boilers is operating properly (see U.4.4.4.3).

18.0 Confirm that steam tracing on [redacted] and [redacted] is operating properly.

19.0 Install steam hose connections at steam drop at [redacted] and at superheater vent on [redacted].

20.0 Drain [redacted] sight-glass and [redacted] sight-glasses.

21.0 Drain [redacted] sight-glass.

22.0 Drain waterwash line between [redacted] and the filter at [redacted]. Purge with air.

23.0 Drain out-of-service package boilers including sight-glass and CBD line.

24.0 Consult with supervision about performing regenerations early so that they will not need to be done during the freeze.

Freezing Conditions Procedures

1.0 Open valves on eyewash/safety showers to keep a minimum flow at all times.

The showers are located at the north-side of [redacted] and the east side of [redacted].

2.0 At [redacted]F switch instrument air over to Nitrogen backup.

3.0 Open all industrial water drops to allow minimum flow.

Included is the industrial water drop next to the chlorinators.

4.0 Blowdown plant air drops to remove moisture.

5.0 Run [redacted] pumps every 2 hours.

6.0 Confirm that [redacted] manually in service.

7.0 Open up a small flow on the HCl scrubber.

8.0 Confirm that Package Boiler heat tracing is on.

9.0 Confirm that caustic system steam tracing is on.

10.0 Confirm that coagulant system heat tracing is on.

11.0 Rotate [redacted] pumps every two hours.

12.0 Block in dilution water and open drains on [redacted] valves to drain dilution water from header.

13.0 Block in dilution water and crack open flanges on [redacted] valves to drain dilution water from header.

14.0 Warm up standby boilers every 2 hours.

15.0 Crack open bypass valves on steam traps.

16.0 Monitor chlorine injection operation. If industrial water flow stops (then chlorine flow stops), block in chlorine cylinder.

Post-Freeze Procedures (Return to Normal Operations)

1.0 Close valves on eyewash/safety showers to stop minimum flow.

The showers are located at the north-side of [redacted] and the east side of [redacted].

2.0 Switch back to instrument air from Nitrogen.

3.0 Close all industrial water drops to stop minimum flow.

Included is the industrial water drop next to the chlorinators.

4.0 Discontinue running [redacted] pumps every 2 hours.

5.0 Close flow on the HCl scrubber.

6.0 Confirm that Package Boiler heat tracing is off.

7.0 Turn caustic system steam tracing off.

8.0 Turn coagulant system heat tracing off.

9.0 Discontinue rotating [redacted] pumps every two hours.

10.0 Close drains on [redacted] valves.

11.0 Close flanges on [redacted] valves.

12.0 Discontinue warming up standby boilers every 2 hours.

13.0 Close bypass valves on steam traps.

14.0 Put chlorinator back in service (if shutdown).

Consult with supervision about which of the following Imminent Freeze Protection measures should be returned to normal. Weather conditions may require that some of these measures be left in place temporarily.

1.0 Remove wind break on the north side of the Glegg Unit and place in dumpster.

2.0 Remove wind break on the east side of the boiler chemical skid and place in dumpster.

3.0 Place [redacted] blowdown pumps back in standby. Initial blowdown should be performed slowly to prevent waterhammer condition.

4.0 Place one of the [redacted] pumps in standby.

5.0 Place one of the [redacted] pumps in standby.

6.0 Place one of the [redacted] pumps in standby.

7.0 Return shutdown [redacted] pump(s) to standby.

8.0 Return shutdown [redacted] pump to standby.

9.0 Return shutdown [redacted] pump to standby.

10.0 Place SCD unit on top of [redacted] in service.

11.0 Disconnect steam hose connections at steam drop at [redacted] and at superheater vent on [redacted] and place connections and hoses back in Cogen shed.

12.0 Refill [redacted] sight-glass and [redacted] sight-glasses.

13.0 Refill [redacted] sight-glass.

14.0 Place waterwash line between [redacted] and the filter at [redacted] back in service.

Reporting Results

1.0 On November 1st, complete the Annual Freeze Protection Checklist and turn in to supervisor for review. Turn in work orders for repairs/insulation needed. Turn in issue requests for stock items needed.

U.4.9.3 Annual Freeze Protection Checklist

2.0 When the Imminent Freeze Protection Procedures are performed, complete the Imminent Freeze Procedure Checklist and turn in to supervisor for review.

U.4.9.3 Imminent Freeze Protection Checklist

3.0 During freezing conditions, record any abnormal conditions in the Operations Logbook and on the shift report (UT-100).

4.0 Instrument Winterization Checklist

U.4.9.3 Instrument Winterization Checklist

7.0 Training Requirements

Training on this procedure is required for all employees under the following conditions:

- Before operating any equipment involved or described in this process or system
- Before operating this process after any changes have been made to the hazards in the process, the technology of the process, or information pertaining to the equipment in the process, and/or
- As a part of refresher training provided at least every three years or more often as necessary.

Also refer to the Formosa Plastics Corporation, TX Process Safety/Risk Management (PSM) Manual, Procedure 5 - TRAINING for additional information.

8.0 Reference

Summary of Revisions

HRSG AREA - COGEN FREEZE PROTECTION PROCEDURE

Document Code: FVUU-P124 4.7.5-NO Revision: 8 Effective Date: 03/01/2022 Original Issue Date: 7/27/2011	**Normal Operating Procedure**	Formosa Utilities COGEN HRSG 1-5

Table of Contents

1.0 Purpose/Scope

Instrument sensing tubing in the Utility cogen area is generally filled with water or condensate that is susceptible to freezing temperatures. A frozen sensing line can result in having no control of the instrument loop. Freeze Protection is provided by electrical heat tracing on selected control and monitoring instruments.

2.0 Organizations Affected

N/A

3.0 Definitions

N/A

4.0 Performance Frequency

This procedure is in effect anytime ambient temperatures are expected to drop below 35^{O}F and down to 25^{O}F.

The Gas Turbine and Steam Turbine Board Operators are qualified to perform this procedure as instructed by supervision.

5.0 Safety and Health Considerations

5.1 SDS Reference

Refer to the SDS Equipment Cross Reference Guide for a listing of the chemicals used in the process equipment in this system. The Corporate SDS Database may be used to refer to properties of and hazards presented by these chemicals.

The Corporate Safe Handling Guidelines are a consolidated source of information on the hazards and protective equipment required to work with various chemicals used in the process or handled outside of the process. These guidelines also contain exposure limits and control measures to be taken if physical contact or airborne exposure occurs.

5.2 PPE Requirements

Below is a list of minimum personal protective equipment (PPE) required in all process areas:

- Approved Hard Hat
- Approved Safety Glasses with side shield
- Approved Hard Toe Footwear.
- Approved Appropriate Hand Protection
- Approved Hearing Protection
- Approved Flame Resistant Clothing

5.3 Cautionary Notes

The Cautionary Notes section is used for general safety cautionary notes, as well as special or unique hazards, relevant throughout the specific job task found in this procedure. N/A indicates that no unique or special hazards have been identified for inclusion in this section. Notes, Cautions, or Warnings relevant to specific sections or steps will be embedded within the procedure, in and around where the hazard is recognized during the specific job task.

N/A

5.4 Safety Systems

N/A

5.5 Environmental

N/A

5.6 Other Considerations

The normal operating ranges are documented in the Log Sheets/Round sheets. The consequences of deviating from the normal operating ranges and the steps to avoid or correct deviations are documented in the Troubleshooting guidelines. The safe upper/lower limits and the health and safety hazards of exceeding the safe upper/lower limits are documented using Attachment 5 of the PSM/RMP Manual Procedure 02 and are part of the process safety information. This process safety information is located in the unit PSI manual.

6.0 Preconditions

N/A

7.0 Tools Required

7.1 Cogen Area Freeze Protection Checklist

UT1 Cogen Freeze Protection Checklist

7.2 HRSG Area

7.2.1 Heat Tracing Breaker Location

FVUU-P124 4.7.5-NO HRSG Heat Tracing Breaker

7.2.2 Heat Tracing Breaker/Instrument List

FVUU-P124 4.7.5-NO HRSG Area Heat Tracing Instrument List

7.2.3 HRSG Area Non-Heat Traced Instrument/Equipment Winterization

FVUU-P124 4.7.5-NO HRSG Area Non-Heat Traced Instrument Equipment Winterization

7.3 **Package Boiler Area**

7.3.1 Heat Tracing Breaker Location

FVUU-P124 4.7.5-NO Pkg Blr Exp Heat Tracing Breaker Location

FVUU-P124 4.7.5-NO Pkg Blr Exp Heat Tracing Breakers

FVUU-P124 4.7.5-NO Pkg Blr Exp Thermostat Location

7.3.2 Heat Tracing Breaker/Instrument List

FVUU-P124 4.7.5-NO Pkg Blr Exp Heat Tracing Instrument List

7.3.3 Package Boiler Area Non-Heat Traced Instrument/Equipment Winterization

FVUU-P124 4.7.5-NO Pkg Blr Area Non-Heat Traced Instrument Equipment Winterization

8.0 Procedure-Normal Operation

8.1 Cogen Freeze Protection Checklist

8.1.1 Completion of the Freeze Protection Checklist by designated parties is required by the 7th of each month between November and March. See 'FVUU-P124 4.7.5-NO Cogen Freeze Protection Checklist' in Section 7.1.

8.2 HRSG Area

8.2.1 Heat tracing electrical breakers are located in the DPU Room (Marshalling Rack Room) adjacent to the control room. The breaker panel is marked "HEAT TRACING." See Section 7.2.1 Heat Tracing Breaker Location.

8.2.2 **Turning On Heat Tracing:**

.1 Notify the shift supervisor that ambient temperature is below 35F.

.2 Close the breakers to turn on the heat tracing.

.3 Heat Tracing will heat the instrument tubing to 80F.

Caution

Be alert to any alarm conditions on the DCS indicating the heat tracing is too hot and boiling the liquid from the instrument sensing line. Identify the control loop & open the heat tracing breaker immediately.

8.2.3 **Turning Off Heat Tracing:**

.1 Notify the shift supervisor that ambient temperature is above 35F.

.2 Open the breakers to turn off the heat tracing.

8.2.4 **Winterization for HRSG Area Instrument/Equipment without Heat Tracing**

.1 The items below is to be tarped at least a day ahead of a forecasted freeze event (temperature below 32F).

.2 [redacted] Instruments/Equipment below are to have a tarp for freeze protection.

.2.1 [redacted] Fuel Flow Transmitter 1

.2.2 [redacted] Fuel Flow Transmitter 2

.2.3 [redacted] Fuel Pressure Transmitter

.2.4 [redacted] Drum Level Valve

.2.5 [redacted] Drum Level Valve

.2.6 [redacted] - Deaerator Level Valve

.2.7 [redacted]- Deaerator Pressure Valve

.3 [redacted] Instruments/Equipment below are to have a tarp for freeze protection.

.3.1 [redacted] - GT Fuel Flow Transmitter

.3.2 [redacted]- HP Drum Level Transmitter 1

.3.3 [redacted]- HP Drum Level Transmitter 2

.3.4 [redacted] - HP Drum Level Transmitter 3

.3.5 [redacted] - HP Drum Level Transmitter

.3.6 [redacted] - LP Drum Level Transmitter 1

.3.7 [redacted]- LP Drum Level Transmitter 2

.3.8 [redacted] - LP Drum Level Transmitter 3

.3.9 [redacted] - LP Drum Level Transmitter

.3.10 [redacted] - Deaerator Level Transmitter 1

.3.11 [redacted] - Deaerator Level Transmitter 2

.3 12 [redacted] - Deaerator Level Transmitter 3

.3 13 [redacted] - Deaerator Level Valve

.3 14 [redacted] - Deaerator Pressure Transmitter 1

.3 15 [redacted] - Deaerator Pressure Transmitter 2

.3 16 [redacted] - Deaerator Pressure Valve

.4 HDPE1 [redacted] Instruments below are to have a tarp for freeze protection.

.4 1 [redacted] - HDPE1 Boiler Feedwater Flow Meter

.4 2 [redacted] - HDPE1 Boiler Feedwater Pressure Transmitter

(Add Steam Hose)

.5 PVC/VCM Steam Instruments below are to have a tarp for freeze protection.

.5 1 [redacted] - PVC/VCM Steam Flow Meter

.5 2 [redacted] - PVC/VCM Steam Pressure Control Valve

(Add Steam Hose)

Note

See 'FVUU-P124 4.7.5-NO HRSG Area Non-Heat Traced Instrument Equipment Winterization' in Section 7.2.3 for more details.

8.3 Package Boiler Area (THS-01, THS-70, THS-80)

8.3.1 Heat tracing electrical breakers are located in the Package Boiler Expansion MCC Room. See 'FVUU-P124 4.7.5-NO Pkg Blr Exp Heat Tracing Breaker Location' in Section 7.3.1.

8.3.2 Turning On Heat Tracing:

.1 Close the breakers to turn on the heat tracing.

See 'FVUU-P124 4.7.5-NO Pkg Blr Exp Pkg Blr Exp Heat Tracing Breakers' in Section 7.3.1.

.2 When the breakers are closed, heat tracing automatically turns on when temperature drops below 40F.

Each heat tracing breaker is tied to a thermostat out in the field, see 'FVUU-P124 4.7.5-NO Pkg Blr Exp Thermostat Location' in Section 7.3.1.

The thermostat will automatically regulate heat tracing temperatures at around 80F.

8.3.3 **Turning Off Heat Tracing:**

.1 Breakers to the Package Boiler Expansion Heat Tracing may remain closed under normal operation.

.2 If alarm conditions on the DCS indicates the heat tracing is too hot and is boiling the liquid from the instrument sensing line, identify the control loop and open the heat tracing breaker immediately.

.3 Notify the shift supervisor.

.4 Open the breakers to turn off the heat tracing.

8.3.4 **Winterization for Package Boiler Area Instrument/Equipment without Heat Tracing**

See 'FVUU-P124 4.7.5-NO Pkg Blr Area Non-Heat Traced Instrument Equipment Winterization' in Section 7.3.3 for guidance.

Reporting Results

1.0 Opening and closing of any heat tracing breaker should be reported as follows:

1.1 Notify your shift supervisor.

1.2 Enter the event into the Control Room Logbook.

1.3 Enter onto the Daily Shift Report.

1.4 Overheating of instrument sensing lines should be reported to supervision with a work order to repair.

2.0 Responsible parties refer to checklist for implementation and items required for completion (See attached checklist in References for detailed items.

3.0 Confirm completion of all checklist items. Completed checklists MUST be returned to Area Engineer for retention.

9.0 Procedure-Temporary Operation

N/A

10.0 Training Requirements

Training on this procedure is required for all employees under the following conditions:

- Before operating any equipment involved or described in this process or system
- Before operating this process after any changes have been made to the hazards in the process, the technology of the process, or information pertaining to the equipment in the process, and/or
- As a part of refresher training provided at least every three years or more often as necessary.

Also refer to the Formosa Plastics Corporation, TX Process Safety/Risk Management (PSM) Manual, Procedure 5 - TRAINING for additional information.

11.0 References

Summary of Revisions

Location	Reason
Step (Unnumbered) - 1.0 (Changed)	edit
Step (Unnumbered) - 4.0 (Changed)	edit
Step 7.1 (Changed)	edit
Step 7.2.2 (Changed)	edit
Step 7.2.3 (Changed)	edit
Step 7.3.2 (Changed)	edit
Step 8.2 (Changed)	edit
Step 8.2.1 (Changed)	edit
Step 8.2.2..1 (Changed)	edit
Caution Step (Unnumbered) - 8.2.2..3 (Changed)	edit
Step 8.2.3..1 (Changed)	edit

Table of Contents

1.0 Purpose/Scope

The purpose of this procedure is to provide guidelines for implementing freeze protection measures for the Water Treatment Area in the events of Freezing Temperatures and/or Severe Weather Storms to ensure the well-being of employees and the integrity of equipment and unit operation.

The Utility Department is responsible to follow instructions provided by the General Manager and utilize the GMO Guideline and this Freeze Protection Procedure as applicable. The Formosa Plastics Texas Point Comfort Freezing Weather Guideline can be found on the Formosa Intranet: Freezing Weather Guideline FTGMSC40r0.

2.0 Organizations Affected

Utilities Water Department

3.0 Responsibilities/Duties

All Units/Departments: All units/departments are responsible to follow instructions provided by the General Manager and utilize Freezing Weather Guideline and this Freeze Protection Procedure, as applicable.

Operation Manager or Department Director: Is responsible to ensure that Freezing Weather Guideline is utilized in their area of responsibility and that their employees are knowledgeable on both Freezing Weather Guideline and their Internal Freeze Protection Procedure.

All Employees: Are responsible for the implementation of Freeze Protection Procedure and to follow instructions by the General Manager.

4.0 Definitions

F-HOUR: The F-Hour (such as F-8 or F-0) represents the number of hours remaining before expected/forecasted 24 consecutive hours of Freezing Weather conditions occur in Point Comfort, Texas.

IDLE MODE: Is the state in which a process unit is shut down and Draining and/or Circulating can begin.

DRAINING: Is the process of evacuating water-type systems so that no contents remain that could freeze and subsequently damage system related equipment.

CIRCULATING: Is the process of circulating water-type systems to ensure they don't freeze and subsequently damage system related equipment.

WATER-TYPE SYSTEM: An un-insulated or un-heat traced system that contains water and/or other materials that will begin to solidify during atmospheric temperatures at and below 32 o F.

FREEZING WEATHER: For the purpose of this Guideline, is atmospheric weather conditions meeting the definitions of FREEZING ATMOSPHERIC WEATHER CATEGORIES defined above.

PREDICTED WEATHER: Weather conditions forecasted by the National Weather Service and the Storm-Geo subscription service.

FREEZING ATMOSPHERIC WEATHER CATEGORIES (Precipitation will vary and may influence the severity of weather category):

Category 1	Description
Temperature Range (°F)	30 - 32
Duration (hours)	24
Category 2	Description
Temperature Range (°F)	25 - 30
Duration (hours)	24
Category 3	Description
Temperature Range (°F)	< 25
Duration (hours)	24

5.0 Safety and Health Considerations

5.1 SDS Reference

Refer to the SDS Equipment Cross Reference Guide for a listing of the chemicals used in the process equipment in this system. Also refer to the SDS(s) for properties of and hazards presented by these chemicals.

5.2 PPE Requirements

Below is a list of minimum personal protective equipment (PPE) required in all process areas:

- Approved Hard Hat
- Approved Safety Glasses with side shield
- Approved Hard Toe Footwear
- Approved Appropriate Hand Protection
- Approved Hearing Protection
- Approved Flame Resistant Clothing

6.0 Tools Required

Please refer to the Freeze Protection Checklist for list of supplies including but not limited to the following:

1. Rolled plastic sheets and tarps
2. Cold weather clothing
3. Tools - valve wrench, adjustable wrench, channel lock pliers
4. Duct tape
5. Rope
6. Emergency Supplies for Essential Personnel (bedding supplies, food rations, potable drinking water, etc)

7.0 Procedure

7.1 Activation of GMO Freezing Weather Guideline

7.1.1 The General Manager may activate Freezing Weather Guideline immediately following:

A prediction of freezing weather conditions meeting the definitions of Categories 1, 2, or 3, as follows:

Category 1: (Expected/Forecasted 24 consecutive hours of Freezing Temperature from 30°F to 32°F)

- All Units/Departments should ensure that preparations for possible freezing weather conditions are audited for compliance with this Freeze Protection Procedure.

Category 2: (Expected/Forecasted 24 consecutive hours of Freezing Temperature from 25°F to 30°F)

- All Units/Departments should ensure that preparations for possible freezing weather conditions are audited for compliance with this Freeze Protection Procedure.
- The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 2.

Category 3: (Expected/Forecasted 24 consecutive hours of Freezing Temperature below 25°F)

- The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 3.
- UT1 and UT3 are expected to run throughout freezing weather events down to 10°F unless otherwise directed by the General Manager.

7.2 Annually - By November 7th

7.2.1 Consult with supervision to set up scaffolding north and east of Caustic/Acid Regeneration Area and Demineralizer Trains, as necessary.

7.2.2 Perform inventory check and to obtain and maintain emergency supplies for Essential Personnel that may not be able to travel due to icy road conditions.

7.3 **Category 1:** (Expected/Forecasted 24 consecutive hours of Freezing Temperature from 30°F to 32°F)

7.3.1 All employees are required to seek regular updated information regarding the facility by going to the FPC-TX internet web site at **www.fpctx.com** to check the work schedule information update or by calling the Telephone numbers that will carry information on Employee Work Schedules: [redacted] and (toll free, out of state connection) [redacted]. Additionally, work schedule information may be communicated via Everbridge, email or other means.

7.3.2 Complete PM on vehicles and keep fuel tanks full.

7.3.3 Ensure Firewater diesel tanks for Expansion and PC Plant are topped off.

7.3.4 Make up and continue to maintain a high level on HCl acid and NaOH caustic bulk storage tanks in case there is unanticipated disruption to the supply from Chlor-Alkali (IEM) or outside sources.

7.3.5 Consult with supervisor and/or management to initiate and maintain communications with LNRA and Chlor-Alkali (IEM) on supply of raw water and regeneration chemicals during predicted freezing weather conditions. Provide regular updates as needed on raw material supply and storage status to supervisor and/or management until all applicable freezing weather conditions have ended.

7.3.6 Turning on Heat Tracing (When forecasted or actual temperature is below 32°F; including wind chill)

.1 Notify the shift and/or area supervisor that forecasted temperature will be below 32°F.

.2 Turn on heat tracing by closing electrical breakers for 100 and 200 areas (three #JBAC2 switches) that are located in the DPU Room adjacent to the Cogen Control Room and ensure proper operation.

.3 Ensure that heat tracing electrical breakers for 300 area, located in MCC room east of Demin control room, are closed and verify proper operation. Heat tracing for this area is set to automatic ambient temperature control.

.4 Ensure that heat lamps inside control housing for sand filters TFW-01 A/B/C are on. Use portable heaters if necessary.

.5 Inspect all piping and equipment insulation/heat tracing and write work orders for missing insulation and any problems encountered.

.6 If freeze protection scaffolds are set up, wrap tarps and/or plastic sheets with duct tape, ropes and any other necessary tools to set up wind breaks. Cut small flaps on the wind breaks for wind venting.

.7 Be alert to any abnormal conditions, i.e. heat tracing overheats. Report any problems to shift/area supervisor.

7.3.7 Turn Off Heat Tracing (When actual ambient temperature is above 32°F)

.1 Notify the shift/area supervisor that ambient temperature is above 32°F

.2 Turn off heat tracing by opening electrical breakers (three #JBAC2 switches) for 100 and 200 areas that are located in the DPU Room adjacent to the Cogen Control Room.

7.4 **Category 2:** (Expected/Forecasted 24 consecutive hours of Freezing Temperature from 25°F to 30°F)

The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 2. Please refer to Attachment 3 of Freezing Weather Guideline for Shutdown Schedule

In addition to following the same procedure for Category 1 freeze weather conditions, the following steps should also be followed.

7.4.1 Limit discharges to CWTP.

7.5 **Category 3:** (Expected/Forecasted 24 consecutive hours of Freezing Temperature below 25°F)

The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 3. Please refer to Attachment 3 of Freezing Weather Guideline for Shutdown Schedule.

In addition to following the same procedure for Category 1 and Category 2 freeze weather conditions, the following steps should also be followed:

7.5.1 Since Utility Water will be expected to remain in operation throughout freezing weather events down to 10°F, unless otherwise directed by the General Manager, operators are responsible to maintain industrial water production and demineralized water production at a reduced production rate and keep circulating all water-type systems based on plant demand to prevent freeze damage.

.1 Make preparation to keep chlorinator water supply line running, even if chlorine feed is blocked in, and keep in circulation to prevent freeze damage.

.2 Consult with supervision if plant industrial water demand is low and make preparation to consider bypassing Sand Filters TFW-01 A/B/C for industrial water production. Ensure the 2" vacuum pump water supply lines are drained completely to prevent freeze damage.

.3 Consult with supervision if plant demineralized water demand is low and make preparation to keep the acid and caustic regeneration lines circulating with dilution water to prevent freeze damage. Select an exhausted train from each regeneration skid and place into regeneration (acid / caustic injection) to keep the dilution water flowing to prevent freeze damage on the chemical lines.

7.6 Return to Normal Operation (Post-Freeze Protection)

7.6.1 Assess the integrity of equipment and systems in Water Treatment for potential damage and notify supervision as necessary.

7.6.2 Consult with supervision before undoing any freeze protection measure. Weather conditions may require that some of these measures be left in place temporarily.

7.7 Reporting Results

7.7.1 Opening and closing of any heat tracing breaker should be reported as follows:

.1 Notify your shift/area supervisor.

.2 Enter the event into the Control Room Log Book.

.3 Enter into the Daily Shift Report.

.4 Overheating of instrument sensing lines should be reported to supervision with a work order for repair.

7.7.2 Responsible parties refer to checklist for implementation and items required for completion (See attached checklist in References for detailed items).

7.7.3 Confirm completion of all checklist items. Completed checklists MUST be returned to Area Engineer or Area Supervisor for retention

8.0 Training Requirements

Training on this procedure is required for all employees under the following conditions:

- Before operating any equipment involved or described in this process or system
- Before operating this process after any changes have been made to the hazards in the process, the technology of the process, or information pertaining to the equipment in the process, and/or
- As a part of refresher training provided at least every three years or more often as necessary.

Also refer to the Formosa Plastics Corporation, TX Process Safety/Risk Management (PSM) Manual, Procedure 5 - TRAINING for additional information.

9.0 Record Retention

All checklists are to be returned to Area Engineer or Area Supervisor for record retention. Records regarding the Winter Weatherization Plan should be kept for a minimum of 6 years.

10.0 References

See attachments below for Heat Tracing Breaker location and Freeze Protection Checklist:

Heat Tracing Breaker Location

Demin Freeze Protection Checklist

Formosa Plastics Freezing Weather Guideline and Attachments below: (Click for FTGMSC40 Procedure and Attachments Link)

Attachment 1 COmmunications Center Telephone Listing

Attachment 2 Action Table for All Units / Departments

Attachment 3 FPC-TX Freezing Weather Guidelines Shutdown Schedule

Summary of Revisions

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 39

FREEZING WEATHER GUIDELINE

Revision Number: 0

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 39

FREEZING WEATHER GUIDELINE

Revision Number: 0

1.0 PURPOSE

The purpose of this Freezing Weather Guideline is to help ensure the well-being of employees and the integrity of equipment and operations.

2.0 SCOPE

This document describes the FPC-TX Freezing Weather Guideline (i.e.: Guideline). This Guideline should be utilized when Freezing Weather is expected/forecasted in the Point Comfort, Texas area.

3.0 ORGANIZATIONS AFFECTED

All Formosa Plastics Corporation, Texas – Point Comfort, facilities.

4.0 RESPONSIBILITIES

General Manager: It is the responsibility of the site General Manager to ensure that this Guideline is utilized as appropriate.

EHS Department: It is the responsibility of the Environmental, Health and Safety Department Directors to assist, as appropriate, in the utilization of this Guideline.

All Units/Departments: All units/departments are responsible to follow instructions provided by the General Manager and utilize this Guideline and their internal Freezing Weather Guidelines, as applicable.

Operation Manager or Department Director: Is responsible to ensure that this Guideline is utilized in their area of responsibility and that their employees are knowledgeable on both this Guideline and their Internal Freezing Weather Guidelines.

5.0 DEFINITIONS

***F-HOUR*:** The F-Hour (such as F-8 or F-0) represents the number of hours remaining before expected/forecasted 24 consecutive hours of Freezing Weather conditions occur in Point Comfort, Texas.

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 39

FREEZING WEATHER GUIDELINE

Revision Number: 0

FREEZING ATMOSPHERIC WEATHER CATEGORIES
(Precipitation will vary and may influence the severity of weather category):

Category 1	Description
Temperature Range (^{o}F)	30 - 32
Duration (hours)	24

Category 2	Description
Temperature Range (^{o}F)	25 - 30
Duration (hours)	24

Category 3	Description
Temperature Range(^{o}F)	< 25
Duration (hours)	24

IDLE MODE: Is the state in which a process unit is shut down and Draining and/or Circulating can begin.

DRAINING: Is the process of evacuating water-type systems so that no contents remain that could freeze and subsequently damage system related equipment.

CIRCULATING: Is the process of circulating water-type systems to ensure they don't freeze and subsequently damage system related equipment.

LEPC: Local Emergency Planning Committee is in charge of countywide planning for aid and communications to the citizens of the county in the event of an emergency.

FREEZING WEATHER: For the purpose of this Guideline, is atmospheric weather conditions meeting the definitions of FREEZING ATMOSPHERIC WEATHER CATEGORIES defined above.

PREDICTED WEATHER: Weather conditions forecasted by the National Weather Service and the Storm-Geo subscription service.

***MINIMUM RATE*:** For the purpose of implementing the Freezing Weather Guideline Shutdown Schedule, minimum rate is a pre-established, reduced production rate that can be safely maintained by operations indefinitely.

***REDUCE PRODUCTION*:** For the purpose of implementing the Freezing Weather Guideline Shutdown Schedule, reduce production means Operations may decrease feed at a pace to reach Minimum Rate by the targeted F hour.

***SHUT-DOWN (S/D)*:** For the purpose of this Guideline, shut-down is the planned sequence of ceasing operations under control without causing unnecessary risk to employees, the environment, the community and equipment. Specifically, all production and reactions are ceased and processes containing hazardous materials are managed to minimize impact should equipment integrity be lost during the freezing weather.

***WATER-TYPE SYSTEM*:** An un-insulated or un-heat traced system that contains water and/or other materials that will begin to solidify during atmospheric temperatures at and below 32 ^{o}F.

6.0 KEY POINTS

6.1 Because freezing weather is unpredictable, this Guideline may be altered by the General Manager. Alterations and deviations to this Guideline can occur only upon approval by the General Manager.

6.2 Draining and Circulating procedures should contain sufficient details to ensure system piping and equipment are adequately de-inventoried such that damage does not occur due to contents freezing.

7.0 GUIDELINES

7.1 ACTIVATION OF THE GUIDELINE

7.1.1 The General Manager **may** activate this Guideline immediately following:

7.1.1.1 A prediction of freezing weather conditions meeting the definitions of Categories 1, 2 or 3, as follows:

Category 1:

- All Units/Departments should ensure that preparations for possible freezing weather conditions are audited for compliance with their internal Freezing Weather Guideline. This is further described in Attachment 2 of

this Guideline.

Category 2:

- All Units/Departments should ensure that preparations for possible freezing weather conditions are audited for compliance with their internal Freezing Weather Guidelines. This is further described in Attachment 2 of this Guideline.

- The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 2.

Category 3:

- The General Manager may initiate full or partial implementation of the Freezing Weather Guideline Shutdown Schedule immediately following Point Comfort having predicted weather that meets the definition of Category 3.

- UT1 and UT3 are expected to run throughout freezing weather events down to 10^0F unless otherwise directed by the General Manager.

7.2 EMPLOYEE STAFFING**:** General

7.2.1 All Units/Departments are to assess their staffing needs to ensure that actions required by this Guideline are achieved on schedule.

7.2.2 All Unit/Departments must maintain a current Employee or Contract Employee On-Call list.

7.2.3 The Health and Safety Department will provide predicted weather updates and information to the General Manager to facilitate prompt decisions regarding the safety of personnel and their families.

7.2.4 All employees should provide at least one contact telephone number and/or e-mail address to their Operations Manager or Department

Director, which will be used for providing plant, weather and travel updates.

7.2.5 All employees are required to seek regular updated information regarding the facility by going to the FPC-TX internet web site at **www.fpctx.com** to check the work schedule information update or by calling the Telephone numbers that will carry information on Employee Work Schedules: [redacted] and (**toll free**, out of state connection) [redacted]. Additionally, work schedule information may be communicated via Everbridge, email or other means.

7.2.6 Once the freezing weather event is over, all units/departments should assess the integrity of their equipment and systems.

7.3 COMMUNICATIONS/ACTIONS REQUIRED: There are critical communications and actions required that should be completed in a timely and effective manner.

7.3.1 Unit / Department Preparation:

7.3.1.1 By or before November 1st of each calendar year, the following tasks and preparation activities should be completed:

7.3.1.1.1 Each unit/department is expected to develop and maintain their internal Freezing Weather Guideline.

a. Internal Freezing Weather Guidelines should identify all water–type systems and determine which ones need to be drained and which ones need to be circulated after shutdown is completed.

b. Procedures should be in place to ensure that water-type systems and equipment are completely drained or properly circulated, as applicable.

c. Emergency Power needs to be available to power the pumps for systems identified for circulation.

7.3.1.1.2 All units/departments should consider and address the need for emergency back-up power in case primary electric power is lost. Contracts guaranteeing delivery of generators are considered essential. Note: Each unit and department intending to install a temporary generator is required to submit a "Request for Permit by Rule Engines" to the Environmental Department for comment and approval.

7.3.1.1.3 All units/departments should consider and address the possible need for emergency large volume air compressors, in case primary electric power is lost and there is a need for plant air or instrument air. Contracts guaranteeing delivery of air compressors are considered essential for units needing air for starting up package boilers. Note: Each unit and department intending to install a temporary air compressor is required to submit a "Request for Permit by Rule Engines" to the Environmental Department for comment and approval.

7.3.1.1.4 Each unit/department should consider Nitrogen needs for shut-down and start-up, make preparations and document in their Internal Freezing Weather Guidelines.

7.3.1.1.5 Each unit/department is responsible for obtaining and maintaining emergency supplies for their Essential Personnel that may not be able to travel due to icy road conditions. Each unit/department should consider bedding supplies, food rations, potable drinking water and a place for personnel to sanitize.

7.3.2 Weather Up-Date:

7.3.2.1 The Health & Safety department will monitor the weather advisories issued by the National Weather Service and Storm Geo and maintain electronic copies of Freezing Weather forecast.

7.3.2.2 At the beginning of each shift or as the reports are received from the National Weather Service and Storm Geo, an update will be issued by Everbridge, email or other means to "All Texas Users". Additional updates should be provided in the same manner as the situation dictates.

7.3.3 Unit/Department Status:

7.3.3.1 In-plant communications are necessary and should be performed by all units and departments on a regular basis. The purpose of in-plant communications is to keep the General Manager up to date on the status of production, shut-down, personnel and evacuation.

7.3.3.1.1 Raw Material and Logistics Status

7.3.3.1.2 Raw material supply, rail, pipeline and shipping during a Freezing Weather event can largely affect FPC-TX. It is critical that FPC-TX remain up to date on supply and logistical conditions to avoid unanticipated facility disruption.

7.3.3.2 Preparations:

7.3.3.2.1 Once Point Comfort is under predicted freezing weather conditions, Operations and Traffic will initiate and maintain communications with applicable area facilities, Raw material suppliers, pipelines, Natural Gas suppliers, Water suppliers (LNRA), rail and shipping.

7.3.3.2.2 Operations and Traffic are to provide regular updates to the General Manager until all applicable freezing weather conditions have ended.

7.3.4 Media Communications

7.3.4.1 The Communications Department Director may issue announcements to the media, both locally and regionally, as necessary for informing employees and the public about the status of FPC-TX operations.

7.3.4.2 In addition, Employee Information Lines, FPCTX Internet and Intranet Web Sites, Everbridge and emails may be utilized to provide employees with updated information.

7.3.5 General Manager's Meeting:

7.3.5.1 The General Manager may conduct regular meetings with Operations Managers, Department Directors and other applicable leadership personnel as follows:

7.3.5.2 **Category 1**

7.3.5.2.1 Meet as requested by the General Manager.

7.3.5.3 **Categories 2 and 3**

7.3.5.3.1 Meet as requested by the General Manager.

7.3.5.3.2 The General Manager may use this opportunity to provide the latest weather forecast information received by Health & Safety, review raw material status reports, employee staffing, etc.

7.3.5.3.3 The General Manager may choose to use this time frame to have Olefins 1, 2 and 3 take the lead in potential shutdown schedule discussion, planning and implementation.

7.3.5.3.4 All Operations Managers and Department Directors must attend these meetings as they will be responsible for reporting the status of their unit/department to the General Manager.

7.3.5.3.5 The Communications Department Director is responsible for attending all meetings for the purpose of taking meeting minutes.

7.3.5.3.6 The Communications Department Director will document meeting minutes and place them in Work-Flow with the following routing: > H&S Director > H.R. Manager > General Manager for

review, comment and approval.

7.3.5.3.7 Upon approval, the Communications Department Director will submit the minutes to each Operations Manager and Department Director via e-mail for the purpose of eliminating miscommunication during these meetings.

7.3.5.3.8 The Operations Managers and Department Directors are responsible for communicating to **all** of their employees the following:

a. Meeting Minutes

b. Status of the facility

8.0 TRAINING REQUIREMENTS

Each Operation Manager and/or Department Director is responsible for assuring that their employees are knowledgeable of the contents of this Guideline.

9.0 FLOWCHART

N/A

10.0 REFERENCES

N/A

11.0 RECORD RETENTION PERIOD

N/A

12.0 ATTACHMENTS

Attachment 1	Communications Center Telephone Listing
Attachment 2	Action Table for All Units / Departments
Attachment 3	FPC-TX Freezing Weather Guideline Shutdown Schedule

ATTACHMENT 1

Communications Center Telephone Listing

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 39

ISC DCU CONTROLLED DOCUMENT

FREEZING WEATHER GUIDELINE

Revision Number: 0

COMMUNICATIONS CENTER TELEPHONE LISTING ATTACHMENT 1

Communications Center:

Formosa Plastics Corporation, Texas	361- 987-7000 (Main Number)
	[redacted] (24 Hr. Emergency)

Essential Personnel Re-Call "Work Schedule Information Resources":

Employee Information Line	[redacted] (Toll Free)
Employee Information Line	
FPC-TX Internet Web Site	www.fpctx.com (Go to Work Schedule)

Local Media:

Port Lavaca Wave Newspaper	361-552-9788 (Port Lavaca)
Victoria Advocate Newspaper	361-575-1451 (Victoria)
Jackson Co. Herald-Tribune	361-782-3547 (Edna)
KVIC FM 104.7	361-576-6111 (Victoria)
KEPG , KUAL, KZNN, KITE	361-576-6111 Victoria)
	361-576-6114 (after hours)
KIXS FM 107.9	361-573-0108 (Victoria)
	361-573-0777
KLUB FM 106.9	361-573-0777 (Victoria)
KAVU TV Channel 25	361-575-2500 (Victoria)

Regional Media:

KTRH AM 740	713-212-5740
	713-212-8740 (Houston)
KVET AM 1300	512-390-5438 (Austin)
KTSA AM 550	210-599-5555 (San Antonio)

Other Area Radio, Television, and Statewide News Services are noted for convenience:

KIOX FM 96.1	979-543-8282 (El Campo)
KMKS FM 102.5	979-244-4242 (Bay City)

ATTACHMENT 2

Action Table for All Units/Departments

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 49
FREEZING WEATHER GUIDELINE

Revision Number: 0

ACTION TABLE FOR ALL UNITS / DEPARTMENTS
ATTACHMENT 2

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 49
FREEZING WEATHER GUIDELINE

Revision Number: 0

ATTACHMENT 3
FPC-TX Freezing Weather Guideline Shutdown Schedule

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 49
FREEZING WEATHER GUIDELINE

Revision Number: 0

Attention: This schedule and all related decisions will be decided and finalized during meetings held by the General Manager. Attendance and participation in these meetings by Operations Managers and Department Directors is mandatory.

Footnotes:

Note 1: Production rate depends on feedstock and main supplies availability coupled with product storage capacity reduction needs.

Note 2: Production rate depends on all Users' and/or Grid demands. CFB steam production rate depends on EG2 demand until EG2 is totally shutdown. Power production rate depends on available boiler capacity and/or user's demands.

Note 3: Production rate depends on ethylene / propylene supply availability and allocation.

Note 4: Unit and Service status depends on related production plants' needs.

Note 5: Production rate depends on Olefins feedstock demand. Natural gas supply rate depends on all Users' demands and outside pipeline gas supply source.

Note 6: Stops charging reactors

Note 7: Plant has [redacted] pipeline- could be used instead of [redacted] supply. Requires [redacted] to consume HCl. [redacted]

Note 8: No Minimum Rate

Note 9: Natural Gas Supply by Pipeline Only

Note 10: At the site General Manager's discretion, Decoking Furnaces may continue after Idle (Units affected: OL-1, OL-2, OL-3, ASP and Utilities)

Formosa Plastics

SUMMER WEATHERIZATION PLAN

Document Code: FVUU-A001A.4.2.5-AD Revision: 1 Effective Date: 03/25/2022 Original Issue Date:	**Administrative / Directive**	Formosa Utilities Administrative Procedures UT Administrative

Table of Contents

1.0 Purpose/Scope

1.1 Purpose/Scope
The purpose of this procedure is to prepare and protect the Power Generation of the Formosa Texas Complex for the events of Summer Temperatures such as excessive prolonged heat events and/or a Severe Weather Storm to ensure the safe and reliable operation of the Units.

2.0 Organizations Affected

2.1 Cogen

2.2 UT3

2.3 Demin

2.4 PC Plant

2.5 Maintenance
- Civil
- Electrical
- Instruments
- Mechanical

3.0 Responsibilities/Duties

3.1 All employees are responsilble for the implementation of this procedure

4.0 Definitions

4.1 Summer Season
June through September

4.2 Hurricane Season
June through November

4.3 Severe Summer Event
Describes ambient temperatures above 100°F, tropical storm or hurricane present.

4.4 ERCOT
Electric Reliability Council of Texas

4.5 NERC
North American Electric Reliability Corporation

4.6 PUCT
Public Utility Commission of Texas

5.0 Safety and Health Considerations

5.1 The safety and performance of plant personnel is the highest priority during extreme weather operations. As part of their periodic training, plant personnel will gain knowledge on how to recognize if they are at risk of:

- Heat exhaustion
- Dehydration
- Fatigue

The suspect onset of any of these conditions will be promptly reported to the plant management.

5.2 Providing:

- Rain suits or raincoats
- Rubber boots
- Flashlights

5.3 Remind employees need to remain hydrated during Severe Summer Events and to shelter in place during extreme storm events.

6.0 Tools Required

6.1 N/A

7.0 Procedure

7.1 The summer months typically challenge plants to operate at the high end of many of its design and operating limits with little margin for error or failure. Regular equipment monitoring, using both plant staff and monitoring centers as applicable, is critical to ensuring plant limits are not violated and equipment is not damaged.

Summer heat, with an uninterrupted buildup of heat over an extended period is common in the FUV area. As equipment is being operated in unusually stressful ambient conditions, surprise failures can happen that might cause the entire unit to come offline. When the air temperature becomes very high, fuel efficiency is affected due to a lower oxygen concentration in the air. Operators and plant managers should be vigilant and focus on these potential areas of stress.

High humidity combined with extreme temperatures during the day can also be a problem, resulting in condensation forming during the nighttime hours.

7.2 Changes or modifications to this procedure

7.2.1 Any changes or modifications to this procedure must be reported to the following for compliance purposes:

- PUCT
- ERCOT

7.2.2 Any recommended changes or modifications should be reported to:

- Utility

7.3 By May 15th

7.3.1 Facilitate Summer Weatherization Preparation meeting to review the plan and review procedures and critical components list. **[Utility Staff]**

.1 Ensure any Summer preparation maintenance and or testing is scheduled. **[Maint]**

.2 Follow-up on progress of any improvements identified based on previous Summer event experiences. **[Utility Staff]**

.3 Complete Utility Tropical Weather Plan **Pre-Checklist supplies [COGEN, Demin, UT3]**

7.4 By May 25th

7.4.1 Complete Utility Tropical Weather Plan **Action Checklist [COGEN, Demin, UT3]**

7.5 By June 1st

7.5.1 Provide generator operators training on Summer readiness. (2 months ahead) **[Utility Staff]**

7.5.2 Submit ERCOT Section 22 Attachment K: Declaration of Completion of Generation Resource Summer Weatherization Preparations and Natural Gas Pipeline Coordination for Resource Entities with Natural Gas Generation Resources **[Utility Staff & FHC]**

FUV Gas Suppliers to be coordinated with prior Summer season

- [redacted]

7.5.3 Review and update plan for the inventory of supplies for emergencies for hot temperatures

- During Severe Summer Event, contact Warehouse or Evironmental Health & Safety for supplies

7.5.4 Verify temporary cooling systems are in working order.

7.5.5 Replace filters on air conditioning units.

7.5.6 Complete any required maintenance on instrument air systems.

7.5.7 Verify cooling water systems are operating properly.

7.5.8 Verify air conditioning units are properly functioning for essential equipment and temperatures are set according to plant specifications

7.5.9 Ensure filters are clean and free of debris.

7.5.10 Visually inspect transformer and switchgear. Verify the fans, cooling pumps (TR2) and oil gauge are properly operating.

7.5.11 Verify there are no air or coolant leaks that can impact cooling performance on cooling systems.

7.6 Tropical Storm and Hurricane Preparation

- Refer to FVUU-A001A.4.2.2-AD - Utility - Internal Tropical Weather Plan & FVUU3A0003 - UT3 Internal Tropical Weather Plan
  - Storm Watch
  - Employee staffing
  - Hurricane Strike Team
- Refer to the UT-1 Tropical Weather Plan Checklist & UT3 Tropical Weather Plan Checklist
  - Supplies for emergencies
  - Back up Critical files & DCS
  - Back up air compressor

7.7 Heat Stress & Fatigue Management during hot conditions

- Reference the following Evironmental Health & Safety company procedures
  - FTESP021 - Heat Stress Program
  - FTESP069 - Fatigue Management

7.8 Preventive Maintenance (PM) for essential equipment
Reference the following procedure for PM's:

- FTMTO003 - Preventive Mainteance Inspection Procedure
- FTESB021 - Process Safety/Risk Management - Procedure 21 - Eqipment ITPM Deferal & Operation with a Known Deficiency

8.0 Training Requirements

8.1 Initial Training on seasonal preparation will be given to new employees of the affected departments upon hiring and Annual Refresher Training will be given to all employees of the affected departments.

8.2 Training will include:

- Review of this Summer Preparation Plan.
- Review of ERCOT and NERC seasonal preparation material.

8.3 Review of Reliability Guidelines addressing Summer seasonal preparation include:

- Assuring that air-conditioned space doors and access points are not left open.
- Arbitrary changing of thermostat set points by workers and or contractors.
- Developing awareness of room temperatures that house electrical equipment during shift rounds.
- Coordination between operations and maintenance staff for urgently requested work when cooling systems are degraded.
- Cleanliness of plant areas and debris that could potentially degrade finned cooler performance or be blown into open cooling water systems, obstructing cooling flow.
- Training review to identify the indicators of clogged screens when inspecting open cooling water systems doors and access points are not left open.

9.0 Record Retention

9.1 Records regarding the Summer Preparedness Plan should be kept for a minimum of 6 years.

10.0 References

10.1 FVUU-A001A4.2.2-AD - Utility - Internal Tropical Weather Plan

10.2 FVUU3A0003 - UT3 Internal Tropical Weather Plan

10.3 FTESP069 - Fatigue Management

10.4 FTESP021 - Heat Stress Program

10.5 FTEST001 - Tropical Weather Plan Manual (FPC TX SITE)

10.6 FTMTO003 - Preventive Mainteance Inspection Procedure

10.7 FTESB021 - Process Safety/Risk Management - Procedure 21 - Eqipment ITPM Deferal & Operation with a Known Deficiency

Document History

Location	Reason
Step 2.2 (Added)	Add UT3 to list
Step 7.3.1..3 (Changed)	add UT3 to list
Step 7.4.1 (Changed)	Add UT3 to list
Step 7.6 (Changed)	add UT3 procedure for checklists
Step 10.2 (Added)	Added UT3 procedure to reference
Section 11.0 (Added)	added section for document history. Not correctly formatted in Rev 0

Summary of Revisions

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 21
HEAT STRESS PROGRAM

Revision No. 1

FORMOSA PLASTICS CORPORATION, TEXAS
PROCEDURE 21
HEAT STRESS PROGRAM

1.0 PURPOSE

The purpose of this program is to:

- Inform employees as to the hazards associated with working in hot environments, either indoors or out-of-doors
- Prevent illnesses caused by heat stress
- Provide guidelines for recognizing symptoms of heat stress
- Provide work schedules for working in hot environments

2.0 SCOPE

Operations or activities in high heat/humidity environments which may cause heat stress problems for workers.

3.0 ORGANIZATIONS AFFECTED

Any and all FPC-TX Units, Departments, Employees, Contractors, Transporters and Visitors.

4.0 RESPONSIBILITIES

4.1 Health and Safety Department

4.1.1 Assist departments in determining work/rest cycles for work tasks.

4.1.2 Perform heat stress evaluations and determine appropriate controls as requested.

4.2 Department Heads and Supervisors

4.2.1 Determine which work environments and/or specific job tasks pose the risk of causing heat stress to their employees. Employees must be made aware of the locations and the associated hazards.

4.2.2 Providing appropriate engineering controls (ventilation, air conditioning, etc.), administrative controls (reduced work periods in hot environments, increased breaks, etc.), and personal protective equipment where appropriate.

4.2.3 Ensure that employees use these controls and any other procedures intended to protect them from environments and/or job tasks likely to cause heat stress.

4.3 Employees

4.3.1 Each individual employee is responsible for their own well-being when working in environments likely to cause heat stress. This includes consuming adequate liquids, recognizing signs and symptoms of overheating, and making supervisors aware when signs and symptoms are noted in the worker himself or in coworkers.

4.3.2 Employees must notify the Medical Department or their supervisor when they believe they are not acclimated to working in a hot environment due to medical reasons, return from vacation or short/long term disability, or other reasons.

4.4 Contractors

4.4.1 Contractors are expected to be familiar with the contents and requirements of this Procedure.

4.4.2 Contractors are expected to have and implement a heat stress program that incorporates the requirements and recommendations of OSHA.

4.4.3 Contractors are required to provide heat stress prevention training to all of their employees.

4.4.4 When working remotely in the plant from a Formosa control building or other area where Formosa-provided water and cool-down areas are available, Contractors are expected to provide water and shade/cool down areas as needed to their employees.

5.0 DEFINITIONS

5.1 Acclimatization: An administrative control where the employee initially works in the high-heat environment for short periods with gradual increases in work times as the employee becomes tolerant of the working conditions.

5.2 Dehydration: Excessive loss of body fluids. A loss of over 5% (10 pounds in a person weighing 200 pounds) is considered severe.

5.3 Energy Drinks: Drinks such as Red Bull and Monster, are marketed as a way to increase mental and athletic performance. They contain caffeine, and other caffeine-like ingredients. Energy drinks are not regulated by the Food and Drug Administration and vary greatly in their ingredients; there is no standard formula. Unlike drugs, the FDA does not require any proof for the safety or effectiveness of energy drinks and energy shots. Some studies show that excessive or repeated consumption of energy drinks can lead to heart and psychiatric conditions.

5.4 Heat Advisory: An administrative tool used to notify personnel when certain temperature and heat index thresholds are crossed so that appropriate actions can be taken to minimize heat stress risk.

5.4 Heat Stress: Any of a number of heat-induced injuries and illnesses ranging in severity from mild (including heat cramps and heat rash), to moderate (fainting and heat exhaustion), to life threatening (heat stroke).

5.5 Recovery Area: A shaded break area such as an air conditioned enclosure or room, tent, tarp, umbrella, etc., where workers can get away from direct sunlight or a direct heat source. The area must provide air movement through natural ventilation or mechanical ventilation such as fans or mist fans and be cool enough to give workers a noticeable difference from the work area.

5.6 Sports Drink – Beverages such as Gatorade, POWERADE®, AllSport®, whose stated purpose is to help workers replace water, electrolytes such as potassium and sodium, and energy during and after work. For purposes of this procedure, energy drinks that contain caffeine are not considered sports drinks.

5.7 Tent - Describes a wide range of structures regardless of size. These structures include traditional tents with or without sides (canopy), air inflated structures, air supported structures, tensioned membrane tents, scaffold structures, or structures that use a combination of fabric and rigid panels.

6.0 KEY POINTS

6.1 Heat stress can range from mild to life threatening. It is important to know the symptoms of heat stress in yourself and others and take action to prevent illness and treat it when necessary.

6.2 While work/rest regimens are presented in this Procedure, it is imperative that each employee self-pace, monitor their health, take sufficient breaks, consume sufficient water and maintain vigilance when working during hot weather.

6.3 Consult the Work/Rest Time Table in Attachment 1 to determine recommended work/rest times and fluid replacement.

6.4 Acclimatization, Wwater, shade and rest are key elements in preventing heat stress.

7.0 PROCEDURE

Heat stress can be a serious problem in hot working environments. The core body temperature for a human must be maintained within a very narrow range. An increase of just a few degrees can result in serious illness or death. The body first deals with hot temperatures by lowering core body temperature by sweating and by circulating blood closer to the skin's surface. Unfortunately, these mechanisms have limitations, which when exceeded can cause a variety of dangerous heat related illnesses.

7.1 Primary environmental factors causing heat stress include:

7.1.1 High temperature or high humidity environments
7.1.2 Direct physical contact with hot objects (such as process equipment)
7.1.3 Lack of air movement
7.1.4 Working near hot surfaces or equipment
7.1.5 Strenuous physical activities
7.1.6 Wearing heavy or protective clothing

7.2 Primary personal risk factors for heat stress include:

7.2.1 Drinking so-called energy drinks (see paragraph 5.3) that contain high caffeine levels and other ingredients. The caffeine, and caffeine-like

substances in these drinks, can lead to increased blood pressure, rapid heartbeat, nervousness, irritability and insomnia. All of these effects will increase your risk of heat stress.

7.2.2 Weight. Those who are overweight are more at risk of heat stress.

7.2.3 Degree of physical fitness. Physically fit workers tolerate heat better than non-physically fit workers.

7.2.4 Degree of acclimatization. Slowly increasing your work time in a hot environment helps you adapt to or "get used to" the heat.

7.2.5 Personal metabolism. The ability to handle hot work environments varies among individuals. Know your own limitations.

7.2.6 Use of drugs (both prescription and non-prescription) and alcohol. Some drugs interfere with the body's ability to cool itself.

7.2.7 Medical conditions or illness. These may limit your ability to sweat, limit circulation of blood, and create other effects that increase the possibility of heat stress.

7.2.8 Restricted diet. If you are dieting or on a special diet you may be more susceptible to heat stress because your fluid levels or electrolyte levels may be low.

7.2.9 Large meals before heat exposure. Large meals cause your body to devote energy to digesting food, limits blood circulation and increases body core temperature.

7.2.10 Prior heat injury. If you have suffered severe heat stroke in the past, you may be more susceptible to heat stress.

7.3 Employee Wellness

A person's health and physical conditioning have been shown to be important factors in preventing heat-related illnesses. The ability to tolerate heat stress increases with wellness and physical fitness. FPC-TX encourages healthy life-styles through promotion of wellness programs and annual physical examinations. Sufficient sleep and good nutrition are

important for maintaining a high level of heat tolerance.

7.4 Heat Stress Types, Symptoms and Treatment.

The occurrence of heat stress depends on a variety of personal and environmental factors. The risk and severity of heat-related illnesses will vary widely among people, even under identical heat stress conditions. The following table shows the types of heat stress, symptoms and treatment. Treatment of heat stress depends on the severity of the symptoms. In treating any type of heat stress, first remove excessive clothing such as FRC, work boots, and PPE to start the cooling process.

Type of Heat Stress	Signs and Symptoms	Causes	Treatment
Heat Rash	Many tiny red blisters on affected area; prickling sensation during heat exposure	Long exposure to humid heat with skin wet with unevaporated sweat	Mild drying lotions; clean skin to prevent infection
Heat Cramps	Painful spasms of muscles (arms, legs or abdominal); onset during or after work hours	Heavy sweating during hot work; drinking large volumes of water without replacing salt loss	Give sports drink (See Definition 5.6)
Heat Collapse	Loss of consciousness or fainting due to inadequate blood flow to the brain; may include dizziness	Lack of acclimatization; poor circulation	Remove to cooler place; move about and stretch to improve circulation
Heat Exhaustion	Fatigue, headache, nausea, giddiness; clammy, moist skin; may faint on standing; rapid, thready pulse	Lack of acclimatization; failure to replace water and/or salt lost during sweating	Remove to cooler environment; keep at rest until water and electrolyte balance has been restored

Type of Heat Stress	Signs and Symptoms	Causes	Treatment
Heat Stroke	Hot, dry skin; core temperature above 105 ºF; confusion, convulsions, loss of consciousness	Lack of acclimatization; lack of physical fitness; recent alcohol consumption; dehydration; chronic heart disease	Immediate and rapid cooling of body; treat shock if necessary; treat as life threatening emergency.

7.5 Heat Stress Prevention

7.5.1 Acclimatization: Workers should get used to being in hot environments initially for short periods, then longer periods. Acclimatization may take several days or longer, depending upon all the factors listed above. Acclimatization must be repeated if the employee is off work for an extended period or has been ill. Supervisors will determine acclimation requirements, in consultation with the Medical Department, based on the employee's history of heat exposure, climatic conditions, and level of physical activity required by the job. Employees are responsible for their own well-being when working in environments likely to cause heat stress. This includes consuming adequate liquids, recognizing signs and symptoms of overheating, and making supervisors aware when signs and symptoms are noted in the worker himself or in coworkers. The Health and Safety Department is available to assist with heat index measurements and PPE and administrative controls to help minimize the heat stress.

Acclimatization Schedule:

- In general, for new worker(s)/employee(s), the schedule **should** be no more than 20% of the usual duration of work in the hot environment on day 1 and a no more than 20% increase on each additional day. For workers who have had previous experience with the job, the acclimatization **should** begin with 50% of the normal workload and time spent in the hot environment on the first day, 60% on day 2, 80% on day 3 and 100% on day 4.

- New workers and those returning from an absence of two weeks or more **should** have a 5-day minimum adjustment period. While a significant amount of acclimatization occurs rapidly in that first week, full acclimatization may take a little longer. Some workers may require up to two or three weeks to fully acclimatize.

  Note: All personnel that have **new** and/or **returning** workers requiring acclimatization for the specific job environment **should** have documentation showing that the worker/employee did have the adjustment periods meeting the requirements shown above.

7.5.2 Heat Advisory Levels

Ambient temperatures and heat index will be monitored with on-site weather station data and with additional notifications provided via Storm Geo or other third-party weather service. Based on the Heat Index, Heat Advisory Levels have been established to assist workers in understanding changing risk levels posed by temperatures.

Advisory Levels are as follows and are presented in the tables in Attachment 1:

1. Advisory Level 1 – Heat Index Temperature Less than 90°F.
2. Advisory Level 2 – Heat Index Temperature >90° but <103°F.
3. Advisory Level 3 – Heat Index Temperature >104 but <130
4. Advisory Level 4 – Heat Index Temperature above 130°F.

Note: The On-duty SSC will ensure notifications concerning Heat Advisory Levels are communicated to FPC-TX Employees and Contractors on-site via Radio All-Calls and/or the Emergency Notification System.

Daily and Weekly Heat Advisory Forecast notifications will be communicated to all FPC-TX Employees and Contractors via the Everbridge Notification System.

7.5.~~2~~3 Limiting exposure time

Consult the Work/Rest Time Tables in Attachment 1 to determine work and break times in the area where work is being performed, as well as fluid replacement recommendations. Refer to Attachment 2 to determine the Heat Index by measuring the temperature and humidity where the work is being performed. Contractors must comply with

these tables unless they have their own heat stress program and tables.

7.5.~~3~~4 Work Schedules

When possible, work schedules should be designed and actions should be taken to reduce the time of heat exposure. Work breaks must provide employees with opportunity to move to a cooler environment. Simple changes in operating procedures can effectively reduce heat exposures. These changes include:

- Schedule strenuous work during the coolest part of the day. Use shifts, e.g., early morning, cool part of the day, or night work.
- Use relief workers or provide additional acclimatized workers to perform the tasks.
- Reduce the physical demand of work, e.g., excessive lifting or digging with heavy objects. Use work-saving devices such as power tools, hoists, cranes, or other lifting aids to reduce the body's work load.
- Postpone nonessential tasks.
- Work-rest cycles give the body an opportunity to get rid of excess heat, slow down the production of internal body heat, and provide greater blood flow to the skin. The H&S Department will assist Departments in determining appropriate work/rest cycles for specific jobs.

7.5.45 Recovery Areas for Heat Stress

- Shade and air movement where workers can get a break from the heat is vital. Any kind of a break from direct sunlight, or the direct heat source, gives a worker time to lower their body temperature. Departments/Contractors shall provide recovery areas for employees, such as tents, tarps, umbrellas, fans with or without water misters, and in severe hot environments, air conditioned vehicles, rooms or enclosures.
- Recovery areas consisting of tents or other flexible structures for use in extreme environmental conditions are excluded from evaluation in the PSM facility siting requirements as specified in the API Standard 756 – Management of Hazards Associated

with Location of Process Plant Tents. The exemption is based on the tent or other flexible structure being occupied by essential personnel and locating the tent further away would increase extreme heat exposure to personnel.

Note: Recovery areas are limited to workers who are authorized by a work permit to use the specific recovery area and not for general use by workers not involved in a heat stress task.

- Recovery areas consisting of rigid structures, such as wood fame trailers or semi-trailers with panel walls, are **NOT** exempt from the facility siting requirements in the PSM Manual, and must be evaluated by the Safety Department on a case-by-case basis.

- Recovery areas are permitted for intermittent occupancy, not continuous occupancy. Continuously occupied recovery areas must be evaluated per the PSM Manual.

7.5.6 Fluid replacement: Thirst is not a good indicator of the need for replenishment. Most workers exposed to hot conditions drink less fluid than needed because they don't feel thirsty.

One rule of thumb is if you are not urinating as often as normal, you are not drinking enough fluids. Also, you should come to work fully hydrated to give your body the best chance to deal with heat stress.

- See Attachment 3 - the Urine Color Chart - and match the color of the urine to the color chart to see if you are drinking enough fluids. (With normal kidney function, your proper fluid balance is shown by the color of your urine.)

  https://gacc.nifc.gov/nwcc/content/pdfs/safety/DOD_Urine%20Color%20Test_Poster.pdf

- Departments are encouraged to post the Urine Color Charts in restrooms to allow employees to determine their hydration levels.

- Employees must have multiple opportunities to consume water

or sports drinks (see Paragraph 5.6) such as Gatorade, POWERADE®, AllSport®, etc. The recommended fluid intake can be found in the table in Attachment 1 – Work/Rest Times. Ideally, workers should drink both water and sports drink during their work shift.

- Provide adequate amounts of cool water and disposable cups in convenient, visible locations close to the work area. Remind workers to drink small amounts of water often (before they become thirsty).

  A good rule of thumb is to drink about 4 cups of water every hour when the heat index suggests a moderate risk level. Water should have a palatable (pleasant and odor-free) taste and water temperature should be 50°F to 60°F, if possible.

- Employees must avoid consumption of alcoholic beverages 12 hours before work, and avoid caffeine and energy drinks (see Paragraph 5.3) before and during work because these beverages cause dehydration. Soda is not an acceptable substitute for water or sports drink.

  Note: Cool water may also be provided in bottled water form or at potable water (PW) stations or locations designated by the unit or department that the employee is working in and should ensure that the travel time to the location is not excessive. This means that all personnel must consider time, distance and accessibility for placement of the PW stations.

7.5.7 PPE: PPE, such as FR clothing, chemical protective clothing and respirators add weight and bulk, and reduce the body's ability to cool itself. If work-rest cycles are not feasible, heat exposure can be reduced by wearing cooling vests. During cool down or rest breaks remove excess PPE and outer clothing especially from extremities such as gloves, work boots, hard hats.

7.5.8 Engineering controls: Use of fans to circulate air, general ventilation, air conditioning, and misting fans are all good ways to reduce heat stress.

7.5.9 Heat Stress Monitoring: Every worker who works in high-risk heat stress conditions should be continuously monitored by themselves and/or a coworker or supervisor. Monitor for signs and symptoms of: