### Title: Alarm and Interlock Management

<table>
<thead>
<tr>
<th>Freeport Site Standard</th>
<th>Function: Environmental, Health and Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.: BCF020.027</td>
<td>Page: 1 of 11</td>
</tr>
</tbody>
</table>

**Reviewed:** 01/16  **Effective:** Phase 1: 07/15  **Phase 2:** 01/17  **Supersedes:** New

**Preparer:** Site Safety Representative  **Owner:** Manager, Environ, Health & Safety  **Approver:** SVP and Gen. Mgr., Freeport

<table>
<thead>
<tr>
<th>Date</th>
<th>Revision Number</th>
<th>Details of Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/15/14</td>
<td>0</td>
<td>New safety standard per MOC 0117-EHS-14-0372.</td>
</tr>
</tbody>
</table>
| 4/14/15   | 1               | • Added 3.1.6 and 3.2.5 – “All bypasses removed shall be checked for proper working condition as part of removing the temporary change and documented in the MOC”  
              • Added clarification on bypass terminator instructions on Attachment 1 to verify operability |
| 7/6/15    | 2               | • Updated section 3.1.6 and 3.2.5 for clarity  
              • Updated Phase 2 implementation date to 6/30/16                                              |
1.0 PURPOSE

1.1 To protect personnel, the environment, and property when it becomes necessary to alter an alarm or interlock from its original design.

2.0 DEFINITIONS

2.1 SIS: Safety Instrumented System (Typically SIL 2 and SIL 3 devices)

2.2 Bypassing: Changing the process outside of the normal operating procedure. This could be control configuration manipulation, electrical bypassing, or mechanical bypassing including but not limited to:
   - Altering the configuration of a block.
   - Installing a safety override in the Safety Instrumented System (SIS)
   - Changing the interlock switch point setting in the DCS, PLC or field instrument.
   - Blocking in the supply air to an interlocked instrument valve.
   - Opening a transmitter bypass valve (equalizing the two sides) to prevent a correct reading.
   - Blocking in the process connection valves to the transmitter.
   - Putting air on the opposite side of a control valve positioner to prevent its normal operation.
   - Mechanically bypassing around hoses or tubing
   - Forcing a value in the DCS or PLC.
   - Mechanical or physical bypass of any kind.
   - Pushing the disable function button in the block detail environment on the DCS.
   - Pushing alarm set points beyond the process trip point.
   - Pushing the alarm set point beyond the safe operating limits.

2.3 Critical Interlocks/Alarms: (See N-P-El-105) an instrument/interlock is critical if a failure can lead to one of the events listed below. However, it should be noted that this list is not all-inclusive, and will vary from plant to plant (not site to site).
Title: Alarm and Interlock Management

| Function: | Environmental, Health and Safety |
| No.:      | BCF020.027                        |
| Page:     | 3 of 11                           |
| Reviewed: | 01/16                             |
| Effective:| Phase 1: 07/15 Phase 2: 01/17     |
| Supersedes:| New                               |
| Preparer: | Site Safety Representative        |
| Owner:    | Manager, Environ, Health & Safety |
| Approver: | SVP and Gen. Mgr., Freeport       |

- An unacceptable loss of production (i.e. failure of an instrument that causes a shutdown)
- A safety incident (i.e. failure of safety critical instrument (BASF Risk Class A, B, C, D))
- Release of a hazardous material to the environment, or loss of environmental monitoring instrumentation for regulatory agencies
- A product quality non-conformance (i.e. ISO 9001 quality instrument failure)
- An unacceptable loss or inaccuracy of important accounting data (i.e. failure of a pay meter)
- Unacceptable equipment damage, failure of an instrument that protects a major piece of equipment with a high cost to repair or replace (i.e. machinery monitoring, vibration, etc.)

2.4 **Non-Critical Interlock/Alarm:** Any interlock/alarm which does not meet the definition of a critical interlock/alarm.

2.5 **Interlock Bypass Log:** An accessible control room log book which includes a copy all active Attachment 1 - Process Interlock Bypass Request Forms.

2.6 **Alarm Management Log:** An accessible control room log book which includes a record of all bypassed, suppressed, disabled, or inhibited alarms.

2.7 **MOC:** Management of Change

2.8 **Suppressed:** Suppressed alarms are configured but do not report an alarm to the operator. Suppression shall have a suppression time associated with it.

2.9 **Foxboro Terms for Clarification**
   2.9.1 **Enabled:** Alarm is configured and turned on. It is displayed, logged, and annunciated.
   2.9.2 **Disabled:** Not configured; turned off. Not annunciated.
2.9.3 **Inhibited**: Disable alarm messages but still detected and logged OR disable alarm messages and alarm detection (configurable)

2.10 **Honeywell Terms for Clarification**

2.10.1 **Enabled**: Alarms status indicators appear on Group displays, Detail displays, and alarm summaries. Alarms are annunciated.

2.10.2 **Disabled**: Alarms status indicators appear on Group and Detail displays, but do not appear on the alarms summaries. Alarms are NOT annunciated.

2.10.3 **Inhibited**: Alarms Do NOT appear on Group displays, Detail displays, or Alarm Summaries. Alarms are NOT annunciated.

2.11 **Qualified I&E Engineer**: The qualified I&E engineers in the area are either the Area I&E Engineer or the Area Control Systems Engineer. If neither of these are available and the Automation Technologist has an I&E background, they may fill this role.

2.12 **Qualified SIS Engineer**: The qualified SIS Engineer is a person who has been trained specifically for this purpose and has been designated in writing as being assigned this role per N-P-EI-300.

2.13 **PS Hub**: All EHS Hub Safety Specialists working with the Freeport site are trained in process safety and can serve as the PS Hub representative.

3.0 **PROCEDURE**

Requirements and authorization for bypassing or disabling of trips and alarms:

3.1 **SIS Systems and SIS Components**

The following is required prior to bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of SIS functionality or components:

3.1.1 MOCs shall be conducted unless covered by written operating/maintenance procedure.
3.1.2 The Freeport Site Attachment 1 - Process Interlock Bypass Request Form shall be completed unless covered by written operating/maintenance procedure.

3.1.3 Two distinct MOC authorizations are required from the Senior Operations Manager/Director and a qualified SIS Engineer or their designee.

3.1.4 Participation in the hazard analysis (ex. Mode of Failure) by the Process Safety (PS) CoE or PS Hub.

3.1.5 The detailed method used for bypassing of the SIS system or components must be documented.

3.1.6 All interlock bypasses that are removed shall be put back into service per design as part of removing the temporary change and verification of termination of the bypass shall documented in the MOC.

3.1.7 All temporary MOC’s generated should be discussed at the tier one meeting to include communication of the risk and the mitigated operations plan.

3.1.8 All temporary MOC’s generated should have a documented discussion at the tier two or three meeting to include communication of the risk, the mitigated operations plan, as well as the forward action plans.

3.1.9 All bypasses shall be documented in the unit’s Interlock Bypass Log for accessibility and review.

3.2 Critical Interlocks
The following is required prior to bypassing, suppressing, making trip point changes, disabling, or inhibiting of critical interlocks or their components that are not addressed in Section 3.1:
### 3.2.1 MOCs shall be conducted unless covered by written operating/maintenance procedure.

### 3.2.2 The Freeport Site Attachment 1 - Process Interlock Bypass Request Form shall be completed for all critical interlocks unless covered by written operating/maintenance procedure.

### 3.2.3 Two distinct MOC authorizations are required from the Production Execution Manager and the Qualified I&E Engineer or their designees.

### 3.2.4 The detailed method used for bypassing of the interlock/trip must be documented.

### 3.2.5 All interlock bypasses that are removed shall be put back into service per design as part of removing the temporary change and verification of termination of the bypass shall documented in the MOC.

### 3.2.6 All temporary MOC’s generated should be discussed at the tier one shift meeting to include communication of the risk and the mitigated operations plan.

### 3.2.7 All temporary MOC’s generated should have a documented discussion at the tier two or three meeting to include communication of the risk, the mitigated operations plan, as well as the forward action plans.

### 3.2.8 All interlock bypasses shall be documented in the unit’s Interlock Bypass Log for accessibility and review.

Exception: Permitted maintenance or troubleshooting approved by the Production Shift Supervisor, completed within the same shift, and under constant monitoring may be performed without an MOC or Process Interlock Bypass Request Form.
3.3 Non-Critical Interlocks

The following is required prior to bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of non-critical interlocks or their components:

3.3.1 The Freeport Site Attachment 1 - Process Interlock Bypass Request Form shall be completed unless covered by written operating/maintenance procedure.

3.3.2 Process bypass authorization is required from the Production Execution Manager or their designee.

3.3.3 The detailed method used for bypassing of the interlock/trip must be documented.

3.3.4 All process bypasses should be discussed at the tier one meeting to include communication of the risk and the mitigated operations plan.

3.3.5 All process bypasses should have a documented discussion at the tier two or three meeting to include communication of the risk, the mitigated operations plan, as well as the forward action plans.

3.3.6 All process bypasses shall be documented in the unit’s Interlock Bypass Log for accessibility and review.

Exception: Permitted maintenance or troubleshooting approved by the Production Shift Supervisor, completed within the same shift, and under constant monitoring may be performed without a Process Interlock Bypass Request Form.

3.4 Critical Alarms

The following is required prior to bypassing, suppressing, making alarm set point changes, disabling, or inhibiting of critical alarms:
3.4.1 MOCs shall be conducted unless covered by written operating/maintenance procedure.

3.4.2 Two distinct MOC authorizations are required from the Production Execution Manager and the qualified I&E engineer or their designees.

3.4.3 All temporary MOC’s generated should be discussed at the tier one shift meeting to include communication of the risk and the mitigated operations plan.

3.4.4 All temporary MOC’s generated should have a documented discussion at the tier two or three meeting to include communication of the risk, the mitigated operations plan, as well as the forward action plans.

3.4.5 All critical alarms shall be documented in the unit’s Alarm Management Log for accessibility and review. An example Alarm Management Log is in Attachment 2.

Exception: Permitted maintenance or troubleshooting approved by the Production Shift Supervisor, completed within the same shift, and under constant monitoring may be performed without an MOC or documenting in the Alarm Management Log.

3.5 Non-Critical Alarms

The following is required prior to bypassing or suppressing of non-critical alarms:

3.5.1 Written authorization is required from the Shift Supervisor in the unit’s Alarm Management Log unless covered by written operating/maintenance procedure.

3.5.2 The following is required prior to permanently deleting non-critical alarms:
   3.5.2.1 MOCs shall be conducted.
3.5.2.2 MOC authorization is required from the Production Execution Manager.

3.5.3 NOTE: Non-critical alarms that are shelved that do not extend beyond the current shift do NOT need to be logged in the Alarm Management Log.

4.0 ROLES AND RESPONSIBILITIES

4.1 Senior Production Director/Manager:
4.1.1 Final MOC start-up approver for bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of SIS functionality or components.

4.2 Production Execution Manager:
4.2.1 Final MOC start-up approver for bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of critical interlocks or alarms or their components that are not addressed in Section 3.1.

4.2.2 Final Attachment 1 - Process Interlock Bypass Request Form approver for bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of non-critical interlocks or their components.

4.2.3 Final MOC start-up approver for permanently deleting non-critical alarms.

4.2.4 Accountable to ensure all bypassed, suppressed, disabled, or inhibited SIS functions, SIS components, critical interlocks, and non-critical interlocks are discussed at the tier one shift meeting to include communication of the risk and the mitigated operations plan.

4.2.5 Accountable to ensure all critical alarms suppressed are discussed at the tier one shift meeting to include communication of the risk and the mitigated operations plan.
<table>
<thead>
<tr>
<th>Freeport Site Standard</th>
<th>Function: Environmental, Health and Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>No.: BCF020.027</td>
<td>Page: 10 of 11</td>
</tr>
<tr>
<td>Reviewed: 01/16</td>
<td>Effective: Phase 1: 07/15</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Preparer: Site Safety Representative</td>
<td>Owner: Manager, Environ, Health &amp; Safety</td>
</tr>
</tbody>
</table>

4.3 **SIS Engineer:**
4.3.1 MOC start-up approver for bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of SIS functionality or their components.

4.4 **Qualified I&E Engineer:**
4.4.1 MOC start-up approver for bypassing, suppressing, making trip point changes, disabling, inhibiting, or deleting of critical interlocks or alarms or their components that are not addressed in Section 3.1.

4.5 **Shift Supervisors:**
4.5.1 Approver for the bypassing or suppressing of non-critical alarms.

4.5.2 Responsible to ensure all bypassed, suppressed, disabled, or inhibited SIS functions, SIS components, critical interlocks, and non-critical interlocks are discussed at the tier one meeting to include communication of the risk and the mitigated operations plan.

4.5.3 Responsible to ensure all critical alarms suppressed are discussed at the tier one meeting to include communication of the risk and the mitigated operations plan.

4.5.4 Accountable to keep the unit’s Interlock and Alarm Management Logs updated and readily accessible to shifts.

4.5.5 Accountable to ensure that all DCS alarm set points changes are documented in the unit Alarm Management Log.

4.5.6 Responsible to run a report of all suppressed alarms in the DCS each shift, compare to the Alarm Management Log, and investigate and drive resolution of anomalies.
4.6 Compliance Engineer

4.6.1 Responsible to perform a routine review of all suppressed alarms and process interlocks bypassed and discuss at the tier two or three meeting to include communication of the risk, the mitigated operations plan, and the forward action plans.

5.0 ATTACHMENTS

5.1 Attachment 1 - Process Interlock Bypass Request Form
5.2 Attachment 2 - Example Alarm Management Log

6.0 REFERENCES

6.1 G-P-EI 201M Mandatory Global Procedure for Electrical and Instrumentation for Quality Control and Plant Safety
6.2 N-P-EI 301 North American Alarm Management Procedure
6.3 N-P-EI-105 Instrument PM/PdM Procedure
6.4 BC032.019 Safety Instrumented Systems