

BP OIL -- TOLEDO REFINERY

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| Document Type: Procedure | Toledo Refinery | Reference No.: SAF 100 |
| Effective Date: October 1, 2011 | Operator Shelter Area Classification Compliance Inspection | Rev. No.: 4 |
| Owner: Rick Chmelovski | Auth. By: D. C. Durnwald (signature on file) | Page 1 of 9 |

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| SCOPE | This procedure is written to ensure that operator shelters at BP Toledo Refinery are fully compliant with the requirements of the Electrical Area Classification in which they are installed. |
| HEALTH Special PPE & Special Hazards | N/A |
| SAFETY | N/A |
| REFERENCE DOCUMENTS | National Electrical Code (NFPA 70) API 500 NFPA 496 |
| SPECIAL MATERIALS & EQUIPMENT | N/A |
| QUALITY | N/A |
| ENVIRONMENTAL | N/A |

OVERVIEW

The BP Oil Toledo Refinery has operator shelters located in Hazardous (Class 1, Division 2) Locations. Equipment not approved for use in hazardous locations is routinely used in the operator shelters during normal activities. This procedure is written to ensure the requirements are met and maintained to permit the use of this equipment.

1.0 Definitions

- **Electrical Inspection Authority** – BP Electrical Engineer who is familiar with installations in hazardous locations and the requirements of API 500, NFPA 496 and the National Electric Code.
- **Hazardous (Class 1, Division 2) Location** – A location in which volatile flammable liquids or flammable gases are handled, processed or used, but in which the liquids, vapors or gases will normally be confined within closed containers or closed systems from which they can escape only in accidental rupture or breakdown of such containers or systems or in case of abnormal operations of equipment.

2.0 Operator shelters

- The operator shelters at the BP Oil Toledo Refinery are categorized as one of the following concerning area classification and methods to use non approved equipment in hazardous locations.
 - 1) The operator shelter is located in a general purpose area.
 - 2) The operator shelter is located in a Class 1, Division 2 area and all electrical equipment in the room is approved for use in the hazardous area.
 - 3) The operator shelter is located in a Class 1, Division 2 area. Fixed hydrocarbon detection equipment is installed to permit the use of non approved equipment for hazardous locations as permitted in section 6.5 of API 500.
 - 4) The operator shelter is located in a Class 1, Division 2 area. The interior of the building is pressurized and considered general purpose as permitted in NFPA 496.
- See Attachment A in the appendix for a specific list of operator shelters and their categories.

3.0 Periodic Audits

- Periodic Audits will be completed to ensure that operator shelters meet the requirements of the area classification in which they are installed.
- The audits will be completed by an electrically knowledgeable person who has an understanding of the requirements of the NEC, API 500 and NFPA 496. The Electrical Inspection Authority in the Reliability Group will complete the audits.
- The audits will be completed quarterly and reported to the Asset Superintendents.
- Audit results will be placed in the site compliance tracking program.
- All non-compliant issues will be entered into Tr@ction as an audit finding.

4.0 Specific Requirements

- The following requirements shall be evaluated during each audit of the operator shelters.
- Operator shelters located in general purpose areas.
 - 1) Periodic audits will not be required for operator shelters located in general purpose areas.
- Operator shelters located in a Class 1, Division 2 areas and all electrical equipment is approved for use in the hazardous location.
 - 1) All fixed and portable electrical equipment in the operator shelter shall be approved for use in a hazardous location. Non approved equipment shall only be used with a valid Hot Work WCC-Permit or Hot Work Spark Potential WCC-Permit per SAF 044. The Hot Work Spark Potential WCC-Permit can only be issued for specific, short duration use.
- Operator shelters located in a Class 1, Division 2 area that use fixed hydrocarbon sensing equipment to permit the use of non approved electrical equipment.
 - 1) The building is essentially vapor tight.
 - 2) Wall penetrations are sealed.
 - 3) Windows are sealed shut
 - 4) Doors have adequate gasketing and weather stripping.
 - 5) Stationary sensors are installed near each door opening to the outside.
 - 6) Gas concentration of 10% activates local alarm.
 - 7) Building contains no electrically heated components such as stoves, coffee pots or toasters that operate above 80% of the ignition temperature of the surrounding hydrocarbon.
 - 8) Gas concentration of 40% or less shuts down power to all equipment not rated for the hazardous location.
 - 9) Gas Detectors calibrated within the last three months.
Note: Gas Detectors are typically checked monthly.
 - 10) Operators trained on alarms and actions to take for alarm/shutdown.
 - 11) Air Conditioning system does not introduce outside air.
 - 12) Doors close tightly when released.
 - 13) All receptacles inside building are labeled to shutdown with hydrocarbon detection system.
- Operator shelters located in a Class 1, Division 2 area and the building is pressurized to consider the interior a general purpose location as permitted in NFPA 496.
 - 1) The pressurization system is functioning properly.
 - 2) The building maintains a pressure of 0.1 inch of water with all openings closed.
 - 3) The pressurization system failure alarm is operable.
 - 4) The hydrocarbon and toxic gas sensors located in the air intake are functioning and have been calibrated within the last three months.

5) The minimum outward velocity requirement of 60 ft/min is difficult to test during a periodic audit. It is assumed this requirement is met during engineering and installation of the pressurization system.

- See Attachments B, C & D in the Appendix for specific forms to be used during the audits.

5.0 Audit Issues

- Issues of non compliance may be observed during the audits. The following procedures are used to document and resolve non-complaint issues.
- Administrative Issues. These include use of a cooking or heated device with a Hydrocarbon Detection System or non approved equipment in a operator shelter with no other mitigation methods.
 - 1) The person completing the audit shall inform the Asset Operating Foreman of issues and resolution if it can be corrected immediately.
 - 2) Written notification to Area Superintendent and Area Coordinators of issues found and resolutions.
 - 3) Items that cannot be immediately resolved will be entered into Tr@ction with appropriate steps to resolve.
- Non Functioning Hydrocarbon Detection Equipment.
 - 1) The analyzer maintenance foreman will be immediately notified of the non functioning equipment.
 - 2) Immediate notification to Asset Superintendent and Asset Coordinator of issues. A Management of Change must be conducted for any fixed monitors that are out of service longer than one shift.
 - 3) Asset personnel will monitor air with continuous portable monitor until stationary hydrocarbon sensors are correctly functioning.
- Non functioning ventilation/pressurization equipment.
 - 1) The facilities maintenance foreman will be immediatly notified of the non functioning equipment.
 - 2) Immediate notification to Asset Superintendent and Asset Coordinator of issues. A Management of Change must be conducted for any equipment that is out of service longer than one shift.
- Miscellaneous Issues.
 - 1) Create Work Request with an emergency priority to correct deficiencies found during audit.
 - 2) Notification to Area Superintendent and Area Coordinator of issues found during the audit.

Revision History**Revision history**

The following information documents at least the last 3 changes to this document, with all the changes listed for the last 6 months.

| Date | Revised By | Changes |
|---------|---------------|---|
| 9/27/11 | R. Chmelovski | Moved Blender Operator Shelter from section 4 to section 3; moved Sat 6 from section 4 to section 5 and added Coke Cutting POD to section 5 on Attachment A. MOC#: M20114887-001 |
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Attachment A

The following operator shelters are located in non hazardous areas at the BP Toledo Refinery. They do not require audits concerning area classification compliance.

1. WWTU
2. Asphalt facilities
3. Central Control Room
4. Water Treatment Plant
5. Marine Dock

The following operator shelters are located in a Class 1, Division 2 area. The building does not contain additional means to reduce the area classification. All electrical equipment shall be rated for the hazardous location.

1. Sat 1
2. LPG Truck Loading

The following operator shelters are located in a Class 1, Division 2 area. Fixed hydrocarbon sensors are installed according to Section 6.5 of API 500 to allow the use of equipment not approved for hazardous locations.

1. Sat 2
2. Sat 4
3. Sat 5
4. Blender Operator Shelter



The following operator shelters are located in a Class 1, Division 2 area. The building is pressurized per NFPA 496 to declassify the interior to a general purpose location.

1. Nerve 1 POD
2. Nerve 2 POD
3. Sat 3 POD



The following operator shelters are located in a General Purpose Location but contain a pressurization system for additional protection. They will be inspected per the pressurized building checklist.

1. Sat 7 POD
2. South Area POD
3. North 1 POD
4. North 2 POD
5. West Area POD
6. Sat 6
7. Coke Cutter POD



Attachment B

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|---|---|
|   BP-Husky Refining | Operator Shelter Compliance Checklist Electrical Equipment Approved for Hazardous Location |
| Building: _____ | Date: _____ |
| Checklist Completed by: _____ | |
| <p>This operator shelter is located in a Class 1, Division 2 area. The building contains no other mitigation method to reduce the area classification. All electrical equipment must be approved for use in a Class 1, Division 2 environment.</p> <p>Does the building contain any electrical equipment not approved for use in a hazardous location? If yes, please explain issues.</p> | |

Attachment C

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|---|--|--|--|-----------|----------------------------------|-----------|-----------------------------|-----------|---|-----------|--|-----------|--|-----------|---|-----------|---|-----------|--|-----------|---|-----------|---|-----------|--|-----------|---|-----------|
|  BP-Husky Refining |  Husky | Operator Shelter API 500 Compliance Checklist Fixed Hydrocarbon Sensors | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Building: _____ Date: _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Checklist Completed by: _____ | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>This Operator Shelter uses fixed hydrocarbon monitors to permit the use of non approved electrical equipment for hazardous locations per section 6.5 of API 500</p> <p>Complete the following questions.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">1) Is Building considered essentially vapor tight?</td> <td style="width: 20%; text-align: right;">yes or no</td> </tr> <tr> <td>2) Are wall penetrations sealed?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>3) Are windows sealed shut?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>4) Doors have adequate gasketing and weather stripping?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>5) Are stationary sensors installed near each door opening to the outside?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>6) Gas Concentration of 10% activates local alarm?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>7) Building contains no electrically heated components such as stoves, coffee pots or toasters?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>8) Gas Concentration of 40% or less shuts down power to all equipment not rated for the hazardous location?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>9) Gas Detectors calibrated within last month?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>10) Operators trained on alarms and actions to take for alarm/shutdown?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>11) Air conditioning system does not introduce outside air?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>12) Doors close tightly when released?</td> <td style="text-align: right;">yes or no</td> </tr> <tr> <td>13) All receptacles inside building are labelled to shutdown with hydrocarbon detection system?</td> <td style="text-align: right;">yes or no</td> </tr> </table> | | | 1) Is Building considered essentially vapor tight? | yes or no | 2) Are wall penetrations sealed? | yes or no | 3) Are windows sealed shut? | yes or no | 4) Doors have adequate gasketing and weather stripping? | yes or no | 5) Are stationary sensors installed near each door opening to the outside? | yes or no | 6) Gas Concentration of 10% activates local alarm? | yes or no | 7) Building contains no electrically heated components such as stoves, coffee pots or toasters? | yes or no | 8) Gas Concentration of 40% or less shuts down power to all equipment not rated for the hazardous location? | yes or no | 9) Gas Detectors calibrated within last month? | yes or no | 10) Operators trained on alarms and actions to take for alarm/shutdown? | yes or no | 11) Air conditioning system does not introduce outside air? | yes or no | 12) Doors close tightly when released? | yes or no | 13) All receptacles inside building are labelled to shutdown with hydrocarbon detection system? | yes or no |
| 1) Is Building considered essentially vapor tight? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2) Are wall penetrations sealed? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3) Are windows sealed shut? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 4) Doors have adequate gasketing and weather stripping? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 5) Are stationary sensors installed near each door opening to the outside? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 6) Gas Concentration of 10% activates local alarm? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 7) Building contains no electrically heated components such as stoves, coffee pots or toasters? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8) Gas Concentration of 40% or less shuts down power to all equipment not rated for the hazardous location? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 9) Gas Detectors calibrated within last month? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 10) Operators trained on alarms and actions to take for alarm/shutdown? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 11) Air conditioning system does not introduce outside air? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 12) Doors close tightly when released? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 13) All receptacles inside building are labelled to shutdown with hydrocarbon detection system? | yes or no | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| If the answer to any question is no, provide comments: | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Attachment D

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|--|--|--|---|-----------|---|-----------|--|-----------|--|-----------|
|  BP-Husky Refining |  Husky | <p>Operator Shelter Compliance Checklist Pressurized Building</p> | | | | | | | | |
| Building: _____ | | Date: _____ | | | | | | | | |
| Checklist Completed by: _____ | | | | | | | | | | |
| <p>This Operator Shelter is located in a Class 1, Division 2 area. The building is pressurized to declassify the interior to general purpose to permit the use of electrical equipment not rated for a hazardous location.</p> <p>Complete the following questions.</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 80%;">1) The pressurization system is functioning normally.</td> <td style="width: 20%;">yes or no</td> </tr> <tr> <td>2) The building pressure is at least 0.1 inch of water with the building openings closed.</td> <td>yes or no</td> </tr> <tr> <td>3) Loss of pressurization alarm is functioning normally?</td> <td>yes or no</td> </tr> <tr> <td>4) The hydrocarbon or toxic gas monitors have been calibrated within the last month?</td> <td>yes or no</td> </tr> </table> | | | 1) The pressurization system is functioning normally. | yes or no | 2) The building pressure is at least 0.1 inch of water with the building openings closed. | yes or no | 3) Loss of pressurization alarm is functioning normally? | yes or no | 4) The hydrocarbon or toxic gas monitors have been calibrated within the last month? | yes or no |
| 1) The pressurization system is functioning normally. | yes or no | | | | | | | | | |
| 2) The building pressure is at least 0.1 inch of water with the building openings closed. | yes or no | | | | | | | | | |
| 3) Loss of pressurization alarm is functioning normally? | yes or no | | | | | | | | | |
| 4) The hydrocarbon or toxic gas monitors have been calibrated within the last month? | yes or no | | | | | | | | | |
| If the answer to any question is no, provide comments: | | | | | | | | | | |

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