

Safeguarding Life and Property

HAZOP WORKSHEET

Node: 1. IPA dispensing (drum to tank) operation.
 Type: Batch Operation
 Deviation: 7. Loss of containment.
 Drawings: CMPID027; SOP 211506-2
 Design Conditions/Parameters: QC released, specification #212276, 200 L (55 gal) IPA drum(s). Drums located over sump and bonded. Properly trained and equipped operator removes drum bungs and screws in transfer pump (P-816). Verify tank bottom valve HV-0104 is closed. Valve V01-15 is opened. Hose is connected from P-816 to V01-01 and V01-01 is then opened. Instrument air supply at 80 - 100 psi is connected to P-0816 and air valve to pump is opened. IPA is dispensed at 15 gpm max. Repeat till all available drums are empty or V-101 is full. Equipment ID: P-816

| Causes | Consequences | Risk Matrix | | | Safeguards | Recommendations |
|-------------------------------------------------------------------------|-------------------------------------------------------|---------------|-------------|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------|
| | | S | L | RR | | |
| 1. Loss of containment from system due to improper camlock connections. | 1. IPA spill into secondary containment area. | Moderate - S3 | Likely - P1 | D | 1. Closed secondary containment. 2. Operator training. 3. Electrically classified location. 4. Ignition sources are prohibited. 5. Non sparking tools. 6. Bonding of drums. 7. Well ventilated operation. | |
| 2. Hose leak or failure. | 1. IPA spill into secondary containment or sump area. | Moderate - S3 | Likely - P1 | D | 1. Closed secondary containment. 2. Operator training. 3. Electrically classified location. 4. Ignition sources are prohibited. 5. Non sparking tools. 6. Bonding of drums. 7. Well ventilated operation. | 2. Verify the dispensing hose is listed for flammable liquid dispensing service. |
| 3. Leak through diaphragm. | 1. IPA discharged with the air exhaust. | Moderate - S3 | Likely - P1 | D | 1. Condition is noticable. 2. LEL detection in the area. | |
| | 2. Air is introduced into the IPA stream. | Moderate - S3 | Likely - P1 | D | 3. Only authorized and qualified operators perform the transfer operation. 4. Leaks only during transfer operation. | |

Ammonia Refrigeration Process Hazard Analysis (PHA)

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Analyzing the vulnerability of your organization is the first step in creating and implementing successful regulatory compliance, emergency response, and workplace safety programs. With years of experience providing risk management support to large and mid-sized companies, we have the expertise to help you clearly assess your organization's strengths and weaknesses. We provide targeted hazard analyses that evaluate exposure to natural, technological and human caused events. Our staff can assist with the application of all PHA techniques including hazard and operability (HAZOP) studies.

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