<table>
<thead>
<tr>
<th>Tasks</th>
<th>Hazard</th>
<th>Failure/Mode</th>
<th>Potential Outcome</th>
<th>Probability</th>
<th>Severity</th>
<th>Exposure</th>
<th>Risk</th>
<th>Engineering/Operational/ Administrative Controls</th>
<th>PPE</th>
<th>Monitor &amp; Measure</th>
<th>Reference to corrective Actions, Objectives and Targets</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHT work</td>
<td>Toxic release</td>
<td>Exposure to raw sewage, thermal and inhalation exposure</td>
<td>Occasional</td>
<td>Critical</td>
<td>Serious</td>
<td>Acceptable</td>
<td>Marine chemist presence for initial opening of CHT work, isolate breather, clean flush with chemicals (salt water, gamazene, calcium hypochlorite), exhaust ventilation, inspect ventilation unit and ductwork, (improved and maintained by maintenance after turn-in, continuous gas monitoring.</td>
<td>Hardware, face shield, rubber boots (for tanks), Standard PPE (hard hat, safety glasses, safety boots), air feed respirator for initial opening, half face or full face respirator (choice of operator or imposed by marine chemist)</td>
<td>Audit/Inspect Daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mogas work</td>
<td>Improper handling, lack of PM to control equipment failure to use PPE, failure to follow procedures</td>
<td>Headache, Loss of consciousness</td>
<td>Occasional</td>
<td>Critical</td>
<td>Serious</td>
<td>Acceptable</td>
<td></td>
<td>Hardware, face shield, rubber boots (for tanks), Standard PPE (hard hat, safety glasses, safety boots), air feed respirator for initial opening, half face or full face respirator (choice of operator or imposed by marine chemist)</td>
<td>Audit/Inspect Daily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFFP Systems work</td>
<td>Improper handling, lack of PM to control equipment failure to use PPE</td>
<td>Marine chemist presence for initial opening of Mogas work, isolate inline tank and flush, gas monitoring, exhaust ventilation, 50% inspection of ventilation by maintenance group</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Audit/Inspect Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fuel lines</td>
<td>Improper handling, lack of PM to control equipment failure to use PPE</td>
<td>Marine chemist initially certifies the space, isolating and clearing procedures, prohibiting hot work until ventilation, gas monitoring. Equipment is inspected prior to use and after turn-in. Ventilation inspections are performed by the maintenance group. Equipment bump tests with known gas before using meter, sensor on monitor to notify if equipment malfunction. Transmitted fire watches and inspection of fire extinguishers.</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Audit/Inspect Daily</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Hazard Identification, Risk Assessment & Determining Controls

### Certification of Hazard Assessment

**Author:** Travis Combs  
**Approved By:** Yaniz Zagagi  
**Current/Pre-launch/Post-launch:** Pre-launch

**Equipment:** Ventilation, Gas Meter

**Update Date:** 12/14/2010

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Hazard</th>
<th>Failure/Mode</th>
<th>Potential Outcome</th>
<th>Probability</th>
<th>Analysis</th>
<th>Risk</th>
<th>Engineering/Operational/Administrative Controls</th>
<th>PPE</th>
<th>Monitor &amp; Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Confined spaces - Fuel Storage</td>
<td>Vapors, Fumes</td>
<td>Improper handling, lack of control equipment, improper PPE, failure to use PPE</td>
<td>Headache, Loss of consciousness</td>
<td>Remote</td>
<td>Marginal</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - Ballast Tanks</td>
<td>Hydrogen Sulfide gas</td>
<td>Improper handling, lack of control equipment, failure to use PPE, meter reading inaccuracy</td>
<td>Loss of consciousness</td>
<td>Remote</td>
<td>Marginal</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - Cargo Tanks (SPM)</td>
<td>Oxygen deficiency</td>
<td>Failure to use control equipment, exposure limits exceeded</td>
<td>Loss of Consciousness, death</td>
<td>Remote</td>
<td>Catastrophic</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - General</td>
<td>Ergonomic - posture, contact stress</td>
<td>Unavoidable nature/environment of task</td>
<td>Strains and sprains, muscle/bone injury</td>
<td>Remote</td>
<td>Marginal</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - Cargo Tanks (SPM)</td>
<td>Explosive</td>
<td>Improper handling, introduction of flame/sparks</td>
<td>Burns</td>
<td>Remote</td>
<td>Critical</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - Cargo Tanks (SPM)</td>
<td>Vapors, Fumes</td>
<td>Improper handling, lack of control equipment, improper PPE, failure to use PPE</td>
<td>Headache, Loss of consciousness</td>
<td>Remote</td>
<td>Marginal</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
<tr>
<td>Confined spaces - Cargo Tanks (SPM)</td>
<td>Oxygen deficiency</td>
<td>Failure to use control equipment, exposure limits exceeded</td>
<td>Loss of Consciousness, death</td>
<td>Remote</td>
<td>Catastrophic</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Auditi/Inspect Daily</td>
<td></td>
</tr>
</tbody>
</table>

- **Tasks:** Confined spaces - Fuel Storage  
- **Hazard:** Vapors, Fumes  
- **Failure/Mode:** Improper handling, lack of control equipment, improper PPE, failure to use PPE  
- **Potential Outcome:** Headache, Loss of consciousness  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Ballast Tanks  
- **Hazard:** Hydrogen Sulfide gas  
- **Failure/Mode:** Improper handling, lack of control equipment, failure to use PPE, meter reading inaccuracy  
- **Potential Outcome:** Loss of consciousness  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Oxygen deficiency  
- **Failure/Mode:** Failure to use control equipment, exposure limits exceeded  
- **Potential Outcome:** Loss of Consciousness, death  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - General  
- **Hazard:** Ergonomic - posture, contact stress  
- **Failure/Mode:** Unavoidable nature/environment of task  
- **Potential Outcome:** Strains and sprains, muscle/bone injury  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Explosive  
- **Failure/Mode:** Improper handling, introduction of flame/sparks  
- **Potential Outcome:** Burns  
- **Probability:** Remote  
- **Analysis:** Critical  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Vapors, Fumes  
- **Failure/Mode:** Improper handling, lack of control equipment, improper PPE, failure to use PPE  
- **Potential Outcome:** Headache, Loss of consciousness  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Oxygen deficiency  
- **Failure/Mode:** Failure to use control equipment, exposure limits exceeded  
- **Potential Outcome:** Loss of Consciousness, death  
- **Probability:** Remote  
- **Analysis:** Catastrophic  
- **Risk:** SERIOUS  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Fire  
- **Failure/Mode:** Improper handling, introduction of flame/sparks  
- **Potential Outcome:** Burns  
- **Probability:** Remote  
- **Analysis:** Critical  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Oxygen deficiency  
- **Failure/Mode:** Failure to use control equipment, exposure limits exceeded  
- **Potential Outcome:** Loss of Consciousness, death  
- **Probability:** Remote  
- **Analysis:** Catastrophic  
- **Risk:** SERIOUS  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Explosive  
- **Failure/Mode:** Improper handling, introduction of flame/sparks  
- **Potential Outcome:** Burns, tissue damage  
- **Probability:** Remote  
- **Analysis:** Critical  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Vapors, Fumes  
- **Failure/Mode:** Improper handling, lack of control equipment, improper PPE, failure to use PPE  
- **Potential Outcome:** Headache, Loss of consciousness  
- **Probability:** Remote  
- **Analysis:** Marginal  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Oxygen deficiency  
- **Failure/Mode:** Failure to use control equipment, exposure limits exceeded  
- **Potential Outcome:** Loss of Consciousness, death  
- **Probability:** Remote  
- **Analysis:** Catastrophic  
- **Risk:** SERIOUS  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Fire  
- **Failure/Mode:** Improper handling, introduction of flame/sparks  
- **Potential Outcome:** Burns  
- **Probability:** Remote  
- **Analysis:** Critical  
- **Risk:** MEDIUM  
- **PPE:** None  
- **Monitor & Measure:** Daily

- **Tasks:** Confined spaces - Cargo Tanks (SPM)  
- **Hazard:** Oxygen deficiency  
- **Failure/Mode:** Failure to use control equipment, exposure limits exceeded  
- **Potential Outcome:** Loss of Consciousness, death  
- **Probability:** Remote  
- **Analysis:** Catastrophic  
- **Risk:** SERIOUS  
- **PPE:** None  
- **Monitor & Measure:** Daily
## Hazard Identification, Risk Assessment & Determining Controls

**Certification of Hazard Assessment**

### Activity/Process: Competent Person
Location: BAE Systems Jacksonville Ship Repair
Current/Pre-launch/Post-launch: Current

### Tasks

<table>
<thead>
<tr>
<th>Hazard Identification</th>
<th>Risk Assessment</th>
<th>Determining Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Tasks</strong></td>
<td><strong>Failure/Mode</strong></td>
<td><strong>Potential Outcome</strong></td>
</tr>
<tr>
<td>Confined Spaces - Cargo</td>
<td>Toxicity, vapors/umes, commonly, reactivity, fire, explosive</td>
<td>Exposure limits exceeded, failure to use PPE, improper handling, lack of control equipment, improper labeling, introduction of ignition sources</td>
</tr>
<tr>
<td>Confined Spaces - Voids</td>
<td>Oxygen deficiency</td>
<td>Failure to use control equipment</td>
</tr>
<tr>
<td>Confined Spaces - Uptakes/Intakes</td>
<td>Hazardous atmosphere</td>
<td>Exposure limits exceeded, failure to use PPE, improper handling, lack of control equipment</td>
</tr>
<tr>
<td>Hollow Structures</td>
<td>Explosive</td>
<td>Improper handling, introduction of flames/sparks</td>
</tr>
<tr>
<td>Shipboard Refrigerants (charging or transfer of refrigerant into system)</td>
<td>Hazardous atmosphere</td>
<td>Exposure limits exceeded, failure to use PPE, improper handling, lack of control equipment</td>
</tr>
<tr>
<td>Confined Spaces - Voids</td>
<td>Hot work on associated piping</td>
<td>Exposure to a flammable atmosphere</td>
</tr>
<tr>
<td>Environmental (Tide)</td>
<td>Oxygen deficiency</td>
<td>Failure to control equipment, exposure limits exceeded</td>
</tr>
<tr>
<td>Confined Spaces - Voids</td>
<td>Thermal</td>
<td>Exposure to extreme temperatures</td>
</tr>
</tbody>
</table>

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## Hazard Identification, Risk Assessment & Determining Controls

**Certification of Hazard Assessment**

**Activity/Process:** Competent Person

**Location:** BAE Systems Jacksonville Ship Repair

**Current/Pre-launch/Post-launch:** Current

**Equipment:** Ventilation, Gas Meter

**Tools:** Various

**Author:** Travis Combs

**Approved By:** Yaniz Zagagi

**Issue Date:** 11/18/2008

**Update Date:** 12/14/2010

**Document ID:** 25-059 Competent Person

---

### Hazards Identification

<table>
<thead>
<tr>
<th>Tasks</th>
<th>Hazard</th>
<th>Failure/Mode</th>
<th>Potential Outcome</th>
<th>Probability</th>
<th>Asses-S</th>
<th>Risk</th>
<th>Are there operational controls in place that meet regulatory requirements and controls the risk?</th>
<th>Engineering/Operational/Administrative Controls</th>
<th>PPE</th>
<th>Monitor &amp; Measure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Electrical</td>
<td>Live parts exposed</td>
<td>Burn, electrical shock</td>
<td>Improbable</td>
<td>Negligible</td>
<td>LOW</td>
<td>Yes</td>
<td>Situational awareness</td>
<td>hard hat, safety glasses, safety shoes, coveralls, leather gloves</td>
<td>Audit/Inspect Daily</td>
</tr>
<tr>
<td></td>
<td>Company vehicle transportation</td>
<td>Accident</td>
<td>Bodily injury</td>
<td>Remote</td>
<td>Marginal</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Familiarity with facilities and roads, comply with highway laws, traveling during off-peak hours, hands-free cell phone usage, schedule is shared with each other</td>
<td>Seat belt</td>
<td>Audit/Inspect Daily</td>
</tr>
<tr>
<td></td>
<td>Oxygen deficiency</td>
<td>Failure to use control equipment, exposure limits exceeded</td>
<td>Loss of consciousness, death</td>
<td>Improbable</td>
<td>Catastrophic</td>
<td>SERIOUS</td>
<td>Acceptable</td>
<td>Isolated and de-energized by contractor (Heller Systems), BAE safety verifies and suggests isolation requirements</td>
<td>hard hat, safety glasses, safety shoes</td>
<td>Audit/Inspect Daily</td>
</tr>
<tr>
<td></td>
<td>Lack of tagout by the ship company</td>
<td>Set off system</td>
<td>Loss of consciousness</td>
<td>Improbable</td>
<td>Critical</td>
<td>MEDIUM</td>
<td>No</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Heat Exposure</td>
<td>Failure to properly hydrate, failure to take breaks</td>
<td>Heat Stress</td>
<td>Remote</td>
<td>Negligible</td>
<td>MEDIUM</td>
<td>Yes</td>
<td>Availability of hydrating fluids, water fountain on every ship when it comes to port, breaks, hydration stations at each pier when temperatures above 90 and additional water fountains added to each ship, increase supervisor and monitor for people who need to take breaks. Weekly monitoring of weather reports to modify working hours accordingly and daily communication to the employees on days in excess of 90 degrees. Communication of hot weather safety to employees and sign-off on sheet that the information has been read.</td>
<td>None</td>
<td>Communicate Daily</td>
</tr>
<tr>
<td></td>
<td>Smoke</td>
<td>Failure to wear and respirator, evacuate the area follow emergency procedures</td>
<td>Smoke inhalation</td>
<td>Probable</td>
<td>Marginal</td>
<td>SERIOUS</td>
<td>Acceptable</td>
<td>Emergency procedures specify to leave the area (training on emergency procedure provided annually). Oxygen provided in medical station. Respiratory protection (RPP training provided annually), fire prevention methods such as fire watch.</td>
<td>Respirators</td>
<td>Training Annually</td>
</tr>
</tbody>
</table>