<table>
<thead>
<tr>
<th>Risk Id</th>
<th>Type</th>
<th>Status</th>
<th>Title</th>
<th>Risk Owner</th>
<th>Organization</th>
<th>Description / Causes</th>
<th>Current Likelihood</th>
<th>Current Cost</th>
<th>Current Schedule</th>
<th>Current Risk Level</th>
<th>Handing Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>222SL-0008-R</td>
<td>Risk</td>
<td>Open (Realized)</td>
<td>Funding Not Available When Required</td>
<td>Ballard, Betsy M</td>
<td>DOE ORP</td>
<td>222-S Laboratory Upgrades have historically been under funded, hindering the Laboratories avoidance of becoming a Single Point Failure. A risk exists that lack of funding hails planned 222-S lab upgrades, and one or more of the aging systems fails causing a shutdown of lab operations until remedied.</td>
<td>Somewhat Likely</td>
<td>4/14/16 - a number of activities were deferred in FY 16. FY17/18 proposal submittal has decreased/funds limited. 4/14/16 - Risk ownership has changed to ORP per MO. Initial likelihood has changed from &quot;Unlikely&quot; to &quot;Somewhat Likely&quot;. <em><strong>Need additional input from other sources for consequence</strong></em> Funds for transformers are part of the budget but not sufficiently funded and the BCR may not be approved. Additional funds may be needed to deal with archived materials. An example would be the cold lab being NTE (11/3/16) 01/11/17 - 222-SL (Cold Lab) delayed due to construction budget. 06/19/17 - Cold Lab funding still delayed. 02/22/18 - Funding cuts are expected.</td>
<td></td>
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</tr>
</tbody>
</table>

**Handling Actions**

1. Develop project baselines and identify MR values.
2. Communicate 222-S Lab baseline to Senior Management for informed decision making.
3. Communicate to Senior Management risks/benefits associated with each BCR request.
4. Cold Lab in the ISP
5. Clarify status of funding.
6. Get funding for ancillary facility
7. Fund 4N in FY18
8. Fund Sample Archive facility
9. 1.2 Renovation
10. Fire detection upgrades funding
11. 4 C funding

**Likelihood**

- Min: 0.35
- ML: 0.50
- Max: 0.65

**Months (Beta Pert)**

- Best Case: 1.00
- ML: 1.50
- Worst Case: 2.00

**$ Millions (Beta Pert)**

- Best Case: $4,000
- ML: $6,000
- Worst Case: $8,000

**Risk Level**

- High
## Risk Register

### 222SL-0009-R Risk

**Title:** New Regulatory Requirements and/or New Interpretation of Existing Requirements are Imposed

**Likely:** Somewhat Likely

**Critical/Excellent:** High

**Description:**

- HEPA Filters awaiting for contract direction.
- State of cold lab radioactive air permit is needed per State of Washington regulations.
- Uncertainty with Part A permit, 2nd transformer, HEPA filter, and 10-10-10 plan.
- RCRA is currently being reviewed (Status Chapter 1 of 14). HEPA Filters expire every 10 years but can be replaced within 10 years.
- 3/30/17 - BERPLAN has increased the work load. 3/29/18 - Labs changed to a severe hazard facility.

**Actions needed:**

1. Maintain regulatory compliance matrices.
2. Formal Change Board process at Company level.
3. PLN 54454
4. Determine Be path forward
5. Negotiate 5th TSD
6. FY19 work 5th TSD to closure

**Likelihood/Consequence:**

<table>
<thead>
<tr>
<th>Likelihood</th>
<th>Consequence</th>
<th>Likelihood Score</th>
<th>Consequence Score</th>
<th>Likelihood Probability</th>
<th>Consequence Probability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Somewhat</td>
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<tr>
<td>Medium</td>
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<td>0.78</td>
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<tr>
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<td>0.90</td>
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<tr>
<td>Crisis/Exceptional</td>
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<td>2.00</td>
<td>3.00</td>
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<td>5.00</td>
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<tr>
<td>Exceptional</td>
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<td>2.00</td>
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<td>2.00</td>
<td>3.00</td>
<td>4.00</td>
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</table>

**Risk Level:** High

**Cost:**

<table>
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<tr>
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<th>Consequence</th>
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</tr>
</thead>
<tbody>
<tr>
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<td>0.35</td>
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<td>0.83</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

**Status:** Open (Realized)

**Responsible Party:** Hader, Wade E DOE ORP

**Explanation:** 222-S Laboratory is responsible for compliance with all existing regulatory requirements. A risk exists that new requirements are imposed and new work is required.

**Discussion:**

- Example: HEPA Filter awaiting for contract direction.
- State of cold lab radioactive air permit is needed per State of Washington regulations.
- Uncertainty with Part A permit, 2nd transformer, HEPA filter, and 10-10-10 plan.
- RCRA is currently being reviewed (Status Chapter 1 of 14). HEPA Filters expire every 10 years but can be replaced within 10 years.
- 3/30/17 - BERPLAN has increased the work load. 3/29/18 - Labs changed to a severe hazard facility.

**Actions:**

1. Maintain regulatory compliance matrices.
2. Formal Change Board process at Company level.
3. PLN 54454
4. Determine Be path forward
5. Negotiate 5th TSD
6. FY19 work 5th TSD to closure

### 222SL-0020-R Risk

**Title:** New Regulatory Requirements and/or New Interpretation of Existing Requirements are Imposed

**Likely:** Critical/Likely

**Critical/Excellent:** High

**Description:**

- HEPA Filter awaiting for contract direction.
- State of cold lab radioactive air permit is needed per State of Washington regulations.
- Uncertainty with Part A permit, 2nd transformer, HEPA filter, and 10-10-10 plan.
- RCRA is currently being reviewed (Status Chapter 1 of 14). HEPA Filters expire every 10 years but can be replaced within 10 years.
- 3/30/17 - BERPLAN has increased the work load. 3/29/18 - Labs changed to a severe hazard facility.

**Actions needed:**

1. Provide on-going integration planning for DFLAW and LAWPS support needs and schedules.
2. Consider adding resources with lab experience.
3. Identify commercial capacity for candidate samples.
4. Evaluation of normal day shift.
5. Identify critical facility needs and incorporate into project planning.
7. Manage changes through existing change control process.
8. Evaluate hiring strategic planning manager for future sampling project integration.
9. Approved overtime work for expedited Be samples.
10. Work with One System to update lab's capacity model
11. Procure Viscometer

**Likelihood/Consequence:**

<table>
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<tr>
<th>Likelihood</th>
<th>Consequence</th>
<th>Likelihood Score</th>
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<th>Likelihood Probability</th>
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<td>0.90</td>
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</table>

**Risk Level:** High

**Cost:**

<table>
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<th>Consequence</th>
<th>Cost</th>
</tr>
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<tbody>
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<td>0.83</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

**Status:** Open (Realized)

**Responsible Party:** Hader, Wade E DOE ORP

**Explanation:** 222-S Laboratory is responsible for compliance with all existing regulatory requirements. A risk exists that new requirements are imposed and new work is required.

**Discussion:**

- Example: HEPA Filter awaiting for contract direction.
- State of cold lab radioactive air permit is needed per State of Washington regulations.
- Uncertainty with Part A permit, 2nd transformer, HEPA filter, and 10-10-10 plan.
- RCRA is currently being reviewed (Status Chapter 1 of 14). HEPA Filters expire every 10 years but can be replaced within 10 years.
- 3/30/17 - BERPLAN has increased the work load. 3/29/18 - Labs changed to a severe hazard facility.

**Actions:**

1. Provide on-going integration planning for DFLAW and LAWPS support needs and schedules.
2. Consider adding resources with lab experience.
3. Identify commercial capacity for candidate samples.
4. Evaluation of normal day shift.
5. Identify critical facility needs and incorporate into project planning.
7. Manage changes through existing change control process.
8. Evaluate hiring strategic planning manager for future sampling project integration.
9. Approved overtime work for expedited Be samples.
10. Work with One System to update lab's capacity model
11. Procure Viscometer
### 222SL-0023-R Risk

**Risk:** Procurements are Delayed  
**Owner:** Legarreta, Jose M  
**TOC:**  
**Likely:** Critical/Excellent  
**Significant:** High  

**Details:**
- Procurements are required for most projects. A risk exists that procurement delays impact planned work execution. Responsibility for impacts requires assessment of specific conditions when/if the risk is realized. Risk addresses those items that are foreseeably and within WRPS' control.
- Increased significantly in FY17 Q1. LOE requirements increased. HVAC and transformer project procurements are also a concern. (11/3/16)
- 3/30/17 - A BTR passed away.
- 10/3/18 - 7 instruments out for proposal.

**Mitigation Strategies:**
1. Identify long lead procurements as early as practical.
2. Add items to critical procurement list based on schedule impacts.
3. Lab needs to increase BTR support with someone that has specific familiarity and expertise in 222-S lab procurement process.
4. Procure representative has been added to the 222-S project review meeting.
5. Procurement is evaluating lean process for FY18.
6. Have design identify and specify long lead items early so procurements may commence early.
7. Assign dedicated points of contact

<table>
<thead>
<tr>
<th>Probability</th>
<th>Likelihood</th>
<th>Cost</th>
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<th></th>
</tr>
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<tbody>
<tr>
<td>High</td>
<td></td>
<td>$2,000</td>
<td>$2,500</td>
<td>$3,000</td>
</tr>
</tbody>
</table>

### 222SL-0033-R Risk

**Risk:** Failure to maintain fire safety system  
**Owner:** Hardy, Dan B  
**TOC:** DOE-ORP/TOC  
**Likely:** Critical/Excellent  
**Significant:** High  

**Details:**
- Currently the fire suppression, alarm, and detection system is needing constant repair. A risk exists that failure of the fire alarm system will occur interrupting lab operations until the system can be repaired/replaced. WRPS is responsible for system replacements.
- 01/11/17 - A letter must be sent to change the ownership to ORP. This risk was raised due to lack of upkeep by MSA due to high employee turnover. Would cost $1.2 million for total system replacement.

**Mitigation Strategies:**
1. Get on MSA reporting list.
2. Participate in PDW meeting for MSA fire maintenance.
3. Interface management
4. Two hour fire sweeps
5. Place in ISP
6. MSA adding staff and maintenance capability
7. Evaluate cheaper replacement
8. Project to replace panel/monitoring

<table>
<thead>
<tr>
<th>Probability</th>
<th>Likelihood</th>
<th>Cost</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<td>Medium</td>
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<td>$3,000</td>
<td>$3,500</td>
<td>$4,000</td>
</tr>
</tbody>
</table>

### 222SL-0036-R Risk

**Risk:** Process water system failure  
**Owner:** Hardy, Dan B  
**TOC:** DOE-ORP/TOC  
**Likely:** Critical/Excellent  

**Details:**
- The current process water system has sprung one minor leak within the last year. MSA has recently sent a noncompliance letter due to lack of air gap. A risk exists that the system begins to leak consistently, requires a total system replacement, and/or water gap must be installed. WRPS is responsible for routine maintenance and individual component replacements. ORP is responsible for system replacements.
- 06/19/17 - FY18 planning is currently being planned.

**Mitigation Strategies:**
1. Inspections
2. Create asbestos work packages
3. Develop estimate
4. Plant forces work review
5. Add to ISP review
6. ORP evaluating FY19 funding for air gap

<table>
<thead>
<tr>
<th>Probability</th>
<th>Likelihood</th>
<th>Cost</th>
<th></th>
<th></th>
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<tbody>
<tr>
<td>High</td>
<td></td>
<td>$3,000</td>
<td>$3,500</td>
<td>$4,000</td>
</tr>
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Page 3 of 9
<table>
<thead>
<tr>
<th>Risk Register</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Register</strong></td>
</tr>
<tr>
<td><strong>222SL-0037-R</strong></td>
</tr>
<tr>
<td>Failure to Maintain Facility Lab Equipment</td>
</tr>
<tr>
<td>A separate contractor from WRPS currently maintains the facility equipment for 222-S. A risk exists that equipment breaks down due to lack of maintenance and causes the shutdown of one or more lab systems.</td>
</tr>
</tbody>
</table>
| 1) Facility fixes the GCMS and the ICP  
2) Negotiate maintenance into extension scope  
3) ORP directed WHL | 0.10 | 0.23 | 0.35 | 1.00 | 1.50 | 2.00 | $0 | $500 | $1,000 | High |
| **222SL-0039-R** | Risk | Open |
| Contract Transition Delays Upgrades | Ballard, Betty M | DOE ORP |
| The Lab and TOC are scheduled to be bid as two separate contracts. A risk exists that upgrades are delayed during the Lab's contractor transition from TOC to Analytical Services Contract. | Likely | Marginal | Crisis/Exceptional | High |
| 1) Develop Transition Plan  
2) Transition Meetings Between TOC and New Contractor | 0.65 | 0.78 | 0.90 | 1.00 | 1.50 | 2.00 | $1,000 | $1,500 | $2,000 | High |
| **222SL-0001-R** | Risk | Open (Realized) |
| 222-S Facility Equipment Failure | Lucas, Daniel R (Dan) | DOE-ORP/TOC |
| Currently the age of the 222-S Lab Facility is approx. 65 + years old. Upgrades have occurred and continue to occur with the life extension plan. A Risk exists that specific equipment not being utilized can fail. WRPS is responsible for routine maintenance and individual component replacements. ORP is responsible for system replacements. | Likely | Significant | Significant | Medium |
| "8/14/16 - LAWPS currently scheduled to startup 2022. 4/14/16 - Risk has now been realized. Handling action #4 has been altered. Needed additional input from other sources for consequence.*** Priorities on equipment have been placed in the FY17 Proposal (06/15/16) Rev. 3 of the life extension study was recently released (11/3/16)." |  |  |  |  |  |  |  |  |  |  |  |
| 1) Maintain year to year progress and continuity of room and facility upgrades per the life extension Strategic Program. Review input results from the current reliability study to re-prioritize work.  
2) Enable better sequencing of the room upgrades and construction by relocating work from two in-lab rooms to a replacement of the 222-Cold lab Facility. This will open two in-lab rooms to turnaround analytical locations.  
3) Prioritize facilities within Utilization Life Extension Study.  
4) Planned HVAC upgrades with phased approach.  
5) Secondary transformer upgrade.  
6) 219-S Repaired using CMs  
7) Facility fixes the GCMS and the ICP | 0.65 | 0.78 | 0.90 | 0.47 | 0.57 | 0.70 | $2,000 | $2,500 | $3,000 | Medium |
| **222SL-0002-R** | Risk | Open (Realized) |
| Spare Parts Not Available for Plant Equipment Maintenance | Lucas, Daniel R (Dan) | TOC |
| Inventories of spare parts are crucial to maintain the integrity of operations when equipment breaks down or needs repair. A risk exists that spare parts are not available when needed delaying 222-S lab operations. | Somewhat Likely | Critical/Exceptional | Critical/Exceptional | Medium |
| 1) Inventory for Key systems/projects  
2) place orders considering very long delivery time.  
3) Participate in the Maintenance and Spare Parts Programs.  
4) Assessment of spares on hand.  
5) Fume hood spares | 0.35 | 0.50 | 0.65 | 0.70 | 0.83 | 1.00 | $3,000 | $3,500 | $4,000 | Medium |
## Risk Register

### 222 SL-0005-R Risk

**Open (Realized)**

**Greenough, Keith J Jr**

**DOE ORP**

**A risk exists that if the funding requests and approvals do not happen in a timely manner, the operational capabilities of the 222-S Lab will be impacted in terms of its capabilities to perform analysis.**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4/14/16</td>
<td>Risk has been realized. Initial risk level has changed from &quot;Unlikely&quot; to &quot;Very Likely&quot;.</td>
</tr>
<tr>
<td></td>
<td>Non radiolab design scheduled to complete FY 16. Construction in FY 17/18 submitted in proposal.</td>
</tr>
<tr>
<td></td>
<td>Funded by NTE. Design process saw a funding freeze occur while it was NTE funded. (11/3/16)</td>
</tr>
<tr>
<td>04/15/17</td>
<td>222 SL (Cold Lab) delay due to construction budget.</td>
</tr>
<tr>
<td>06/19/17</td>
<td>Cold Lab funding still delayed. 06/24/17 - RFP has been issued.</td>
</tr>
<tr>
<td>08/24/17</td>
<td>RFP has been issued.</td>
</tr>
<tr>
<td>06/28/18</td>
<td>Currently evaluating alternatives</td>
</tr>
</tbody>
</table>

(1) Performed Pre-conceptual Study
(2) Initiate Design
(3) Initiate Construction
(4) Include Cold Lab in FY17/18 Proposal
(5) Cold Lab in ISP
(6) Clarify status of funding.
(7) Attach PBI
(8) EV study to reduce costs

| 0.10 | 0.23 | 0.35 | 0.70 | 0.83 | 1.00 | $3,000 | $3,500 | $4,000 |

### 222 SL-0016-R Risk

**Open (Realized)**

**Hardy, Don B**

**DOE ORP/TOC**

**Sub-contractors and other prime contractors do not perform as required**

<table>
<thead>
<tr>
<th>Date</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/4/16</td>
<td>Sharing recourses with new ASPC. Changed the likelihood from Likely to Somewhat Likely and</td>
</tr>
<tr>
<td></td>
<td>changed the consequence from Significant to &quot;Marginal&quot;.</td>
</tr>
<tr>
<td></td>
<td>Monthly talks with MSA for fire system Omni lock and computer maintenance are occurring due</td>
</tr>
<tr>
<td></td>
<td>to lack of upkeep by MSA. 11/3/16 - Thermo desorption sample scope is moving to WHL</td>
</tr>
</tbody>
</table>

(1) Delete sub-contractors and integrate into teams as much as possible.  
(2) Perform necessary surveillances, quality/safety on sub-contractors as required.  
(3) Evaluate adding new analytical subcontract resources  
(4) Negotiate overtime for expedited BE samples.

<p>| 0.35 | 0.50 | 0.65 | 0.47 | 0.57 | 0.70 | $0   | $500 | $1,000 |</p>
<table>
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</table>

### 222SL-0018-R Risk

- **As Found Field Conditions Differ from Expected (Materials & Radiological, Hazardous Materials and Electrical)**
  - **Open (Realized)**
  - Hardy, Don B
  - DOE-ORP/TOC
  - **Risk Rating:**
    - Likelihood: Likely
    - Impact: Significant
    - Risk: Medium
  - **Conditions:**
    - The 222-S Laboratory is an aging facility. During normal operations, circumstances can arise where conditions encountered are not what is expected. A risk exists that the as found field conditions are different from expected from either a materials (including hazardous materials) or a radiological perspective and project rework is required. Currently upgrades have a planned Scope of Work, with most existing conditions known and planned for. WRPS is responsible for minor differing as found field conditions. ORP is responsible in cases requiring considerable expenditure of resources due to unforeseen conditions.
  - **Likely Actions:**
    - 1. Conduct field walk downs (including electrical investigations) as needed prior to design.
    - 2. Perform radiological surveys prior to design work.
    - 3. Utilize GPR surveys in and around areas to be excavated.
    - 4. Investigate large scale drawings to annotate actual field conditions.
    - 5. Incorporate into the Project schedules and broaden.
  - **Likely Significant Actions:**
    - 6. Re-prioritize work scope to limit overall impact on the mission.
  - **Rights:**
    - 0.65
    - 0.78
    - 0.90
    - 0.47
    - 0.57
    - 0.70
    - 2,000
    - 2,500
    - 3,000
    - Medium

### 222SL-0025-R Risk

- **Testing Identifies Design/Construction Issues**
  - **Open (Realized)**
  - Hardy, Don B
  - DOE-ORP/TOC
  - **Risk Rating:**
    - Likelihood: Likely
    - Impact: Significant
    - Risk: Medium
  - **Conditions:**
    - Testing is performed at the conclusion of 222-S Laboratory Upgrade work, prior to turnover to operations. A risk exists that testing identifies items requiring rework and testing. WRPS is responsible to correct deficiencies noted during acceptance testing and ORP is responsible to correct deficiencies identified during operational testing.
  - **Likely Actions:**
    - 1. Develop startup testing requirements early in projects.
    - 2. Enforce quality control standards.
    - 3. Commensurate to the work scope throughout projects.
    - 4. Perform shop/bench tests as appropriate.
    - 5. Develop protocols to ensure that operability, maintainability, and constructability reviews are appropriately applied to engineering designs as needed based on design complexity.
    - 6. Evaluate hiring strategic planning manager for future sampling project integration.
    - 7. Testing oversight for HVAC project.
    - 8. PMs on old HVAC controls
  - **Likely Significant Actions:**
    - 0.65
    - 0.78
    - 0.90
    - 0.47
    - 0.57
    - 0.70
    - 2,000
    - 2,500
    - 3,000
    - Medium
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<th>Probability</th>
<th>Impact</th>
<th>Cost</th>
</tr>
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<tbody>
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<tr>
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<table>
<thead>
<tr>
<th>Probability</th>
<th>Impact</th>
<th>Cost</th>
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<tbody>
<tr>
<td>0.10</td>
<td>0.23</td>
<td>$1,000</td>
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<tr>
<td>0.35</td>
<td>0.33</td>
<td>$1,500</td>
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<tr>
<td>0.23</td>
<td>0.47</td>
<td>$2,000</td>
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<tr>
<td>0.10</td>
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<table>
<thead>
<tr>
<th>Probability</th>
<th>Impact</th>
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<tbody>
<tr>
<td>0.00</td>
<td>0.05</td>
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<td>0.10</td>
<td>0.23</td>
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Page 8 of 9
### Risk Register

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</thead>
<tbody>
<tr>
<td>222SL-0014-R</td>
<td>Analytical Instrumentation is Received Late and/or faulty</td>
<td>Unlikely</td>
<td>Significant</td>
<td>Significant</td>
<td>Low</td>
<td>5/4/16 - added handling action, and lowered likelihood for initial and residual.</td>
<td>0.10</td>
<td>0.23</td>
<td>0.35</td>
<td>0.47</td>
<td>0.57</td>
<td>0.70</td>
<td>$2,000</td>
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<tr>
<td></td>
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<td></td>
<td>FY 14 scope with a two year delay.</td>
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<td>GMC sent the product and it wasn't properly certified.</td>
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<td>(03/15/16)</td>
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<td>06/19/17 - All five major procurements for this year have been received without issue.</td>
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<td>10/3/18 - C/VA kept failing and was replaced by vendor. Installation of new equipment lead to fire.</td>
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<td>05/19/16 - TVAT staff (8 people) has been added. Risk has been lowered from High to &quot;Low&quot;</td>
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<td>3/30/17 - Impact of Beryllium sampling has forced the need for overtime.</td>
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<td>06/19/17 WHL for IrI work</td>
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<td>06/28/18 - 2 retirements</td>
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Report Search Parameters:

Registers: 222 S Lab Register
Status: Open, Open (Realized), Proposed

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