LLNL Facility Screening Report (SCR) for B362

G.A. Cooper

September 24, 2007
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LLNL Facility Screening Report (SCR) for B-362

Lead Preparer: Greg Cooper       Date Performed: 8/28/2007

Facility Description

Briefly describe facility use, physical structure, location and attach a building layout:
Building 362 (3,749 gross square feet) is a single-story concrete block structure with a built-up roof over steel joists. A boiler/chiller/electrical room is located in the West center portion of the building. B-362 is located near the center of the Laboratory at the corner of West Inner Loop Road and Fifth Street and is approximately 859 meters (2,818 feet) from the nearest site boundary.
B-362 is houses laboratories supporting biological activities including the use of radiological tracers.

Define facility type:
Check:
☑ Single Structure or Area: (B/Tr/A) B-362
☐ Complex of Buildings: Designation ________
☐ Segment* of Bldg or Complex: ________
    Seg.# ______
*Attach justification for segmentation

Owner Organization:
Directorate: Chemistry, Materials, and Life Sciences
Facility AD: Tomas Diaz de la Rubia

Final Facility Classification: (Check)
☑ LSI  ☐ Low  ☐ Moderate  ☐ High  ☐ Nuclear Facility  ☐ Accelerator

Concurrence Signatures for Facility Classified as LSI**:
Lead Preparer: [Signature]          Date: 8/30/07
AB Section Leader or designee: [Signature]          Date: 8/30/07
ES&H Team Leader or designee: [Signature]          Date: 8/30/07

Approval Signature for Facility Classified as LSI**:
Facility Management: [Signature]          Date: 8/30/07

Supporting Documentation Appended
Check as appropriate:
☐ Justification for Segmentation
☐ Chemical Hazard List
☑ Radiological Hazard List
☐ Explosive Hazard List
☑ Building Layout

Comments:

** Signatures are not required on this form for facilities classified as Low, Moderate or High. Approval signatures for these are on the cover of the Tier 2 or Tier 3 SBDs.
Identification of Operations, Inventories, and Hazards

List key operations that are conducted within the facility:

Research involving analytical chemistry and microbiology.

Work with small amounts of radioactive tracer elements (C-14 and tritium)

<table>
<thead>
<tr>
<th>Nearby Facility threats?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Did Facility Management receive any notifications of credible external threats from nearby LLNL facilities (&gt;TEEL2 after mitigation)?</td>
</tr>
</tbody>
</table>

If yes, list the following for each notification:

<table>
<thead>
<tr>
<th>Source Facility:</th>
<th>Facility Contact(s):</th>
<th>Phone # (s):</th>
</tr>
</thead>
</table>

Describe hazard(s) associated with nearby facility:

<table>
<thead>
<tr>
<th>Hazard Identification Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>Check the hazard types found in the facility.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Not Authorized</th>
<th>Authorized</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>☒</td>
</tr>
<tr>
<td>☐</td>
<td>☒</td>
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<td>☐</td>
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<tr>
<td>☐</td>
<td>☒</td>
</tr>
</tbody>
</table>

- Biological Hazards: Complete block I, below
- Chemical Hazards: Complete block II, below
- Explosive Hazards: Complete block III, below
- Radiological Hazards: Complete block IV, below
- Industrial Hazards: Complete block V, below
### I. Biological Hazards

**Check BioHazard Type**

- **Non-Select Agents**
  - Check highest group in facility:
    - RG1 Agents
    - RG2 Agents
    - RG3 Agents

- **Select Agents**
  - Select highest group in facility:
    - RG1 Agents
    - RG2 Agents
    - RG3 Agents

- Other BioHazards (e.g., nucleic acid, lab animals, contaminated needles/sharps, animal/human tissues & fluids)


**Applicable Control Level for Biohazards**

Check highest Biological Safety Level (BSL) in facility, as applicable:

- BSL-1
- BSL-2
- BSL-3 and/or
- Bloodborne Pathogens Standard (Note: AB classification = LSI)

### II. Chemical Hazards

**Check ChemHazard Type**

- Flammable, volatile or fuming
- Toxic materials (acutely toxic, toxic, bio-derived toxin, systemic toxin, toxic gases)
- Corrosives/irritants
- Reactive materials (e.g., air/water sensitive; pyrophoric; thermally, shock, or friction sensitive; perchlorate)
- Carcinogens, mutagens, reproductive hazards
- Pesticides
- Beryllium
- Materials of special concern (e.g., alkali metals, fluorine, asbestos, lead, mercury, PCB)
- Other regulated metals (e.g., chromium, copper, nickel, zinc)
- Other: ____

**Do any chemicals exceed LSI classification?**

- YES
- NO

For chemicals that exceed LSI classification, attach maximally planned chemical inventory listing.

### III. Explosive Hazards

**Check**

- Primary High Explosives
- Secondary High Explosives
- Propellants/Low Explosives
- Firearms Ammunition

**Do any of the explosive types checked above have any of the following associated hazards?**

- Fragmentation Hazards (Primary Fragments)
- Group L Explosives

Attach maximally planned inventory listing for each explosive type checked.

### IV. Radiological Hazards

**Check Sum of Ratio**

- <1 of RQ thresholds (40 CFR 302.4 Appendix B)
- >1 of RQ thresholds < Cat. 3 Thresholds (DOE-STD-1027-92, Table A.1)
- >Cat. 3 Thresholds (DOE-STD-1027-92, Table A.1) < Cat. 2 Thresholds (DOE-STD-1027-92, Table A.1)

**Does facility contain the following?**

- Radiation Generating Devices:
  - Radiation generating devices not covered by DOE O 420.2A (e.g., X-rays, Electron Beams, Radiography Equipment): class
  - Radiation generating devices covered by DOE O 420.2A (Accelerators).

- Exempted materials:
  - Radioactive Certified Sealed Sources
  - Rad. In Type B Containers with current certificates of compliance
  - Either in quantities> Cat. 3 thresholds (DOE-STD-1027-92, Table A.1)

Attach listing of maximally planned radiological materials inventory.
## V. Industrial Hazards

<table>
<thead>
<tr>
<th>Check if hazard present</th>
<th>Industrial Hazard</th>
<th>Examples of industrial hazard(s) for each general category. (Select Industrial Hazards found.)</th>
<th>List industrial hazard(s) that could directly impact the public (fence-line) or colocated worker (100 m).</th>
</tr>
</thead>
<tbody>
<tr>
<td>☑</td>
<td>Electrical</td>
<td>☐ Battery banks, ☐ Cable runs, ☐ Diesel generators, ☑ Electrical equipment, ☐ Heaters, ☐ High voltage (&gt; 600V), ☑ Motors, ☐ Power tools, ☐ Pumps, ☑ Service outlets, ☑ Fittings, ☑ Switchgear, ☐ Transformers, ☑ Capacitors, ☑ Magnetic fields, ☐ Transmission lines, ☑ Wiring/underground wiring, ☐ Other: ______.</td>
<td>None</td>
</tr>
<tr>
<td>☑</td>
<td>Thermal</td>
<td>☑ Boilers, ☑ Bunsen burner/hot plates, ☑ Electrical equipment, ☑ Electrical wiring, ☐ Engine exhaust, ☐ Furnaces, ☐ Heaters, ☐ Lasers, ☐ Steam lines, ☐ Welding surfaces, ☐ Welding torch, ☐ Other: ______.</td>
<td>None</td>
</tr>
<tr>
<td>☑</td>
<td>Kinetic</td>
<td>☐ Acceleration/deceleration, ☑ Bearings, ☑ Belts, ☑ Carts/dollies, ☑ Centrifuges, ☐ Crane loads (in motion), ☑ Drills, ☑ Fans, ☐ Firearm discharge, ☐ Fork lifts, ☐ Gears, ☐ Grinders, ☑ Motors, ☐ Power tools, ☐ Presses/shears, ☐ Saws, ☐ Vehicles, ☐ Airplane, ☐ Vibration, ☐ Other: ______.</td>
<td>None</td>
</tr>
<tr>
<td>☑</td>
<td>Potential (pressure)</td>
<td>☐ Autoclaves, ☑ Boilers, ☐ Coiled springs, ☐ Furnaces, ☑ Gas bottles, ☐ Gas receivers, ☑ Pressure vessels, ☑ Vacuum vessels, ☑ Pressurized system (e.g., air), ☐ Steam header and lines, ☐ Stressed members, ☐ Other: ______.</td>
<td>None</td>
</tr>
<tr>
<td>☑</td>
<td>Potential (height/mass)</td>
<td>☐ Cranes/hoists, ☐ Elevated doors, ☐ Elevated work surfaces, ☐ Elevators, ☐ Lifts, ☐ Loading docks, ☐ Mezzanines, ☐ Floor pits, ☑ Scaffolds and ladders, ☐ Stacked material, ☐ Stairs, ☐ Other: ______.</td>
<td>None</td>
</tr>
<tr>
<td>☑</td>
<td>Internal Flooding Sources</td>
<td>☑ Domestic water, ☑ Fire suppression piping, ☐ Process water, ☐ Other: ______.</td>
<td>None</td>
</tr>
</tbody>
</table>

### Hazard Classification

Select the appropriate hazard level from the dropdown menu:

| Biological | LSI       |
| Chemical   | LSI       |
| Explosive  | Not authorized |
| Radiological materials | LSI |
| Radiation generators | Not authorized |
| Industrial | LSI       |
**Controls for LSI Hazards:** (Controls for Low, Moderate and High hazards are addressed in Tier 2 or Tier 3 SBDs.)

**Briefly describe controls developed to assure that facility operations do not exceed the facility classification:**

1. Biological operations will be limited to those that can be performed at BSL-2 controls or less. All biological activities shall be reviewed via the IWS process and the LBOC prior to starting.

2. Inventories of individual chemicals shall be maintained below the lesser of the Q-values Q1 at 100 meters or Q0 at 600 meters.

3. CMLS manages its programmatic inventory of radiological materials to maintain and comply with a Facility Safety Basis Envelope (SBE) of LSI for B362. A Radioactive Materials Inventory System is maintained by facility management. It is reconciled as frequently as necessary to ensure that the facility radiological inventory remains below the Final RQ limits in 40 CFR 302.4 Appendix B on a cumulative sum-of-the-ratios basis for all isotopes. Inventory reconciliation more frequent than annual shall be performed if the inventory exceeds an administrative control level of 75% of the RQ limits. Prior to receipt, additions are verified not to cause the radiological inventory to exceed the RQ limits. Additions not fully characterized are estimated using field measurements and owner knowledge.

4. Industrial hazards are managed by facility management at the LSI level.

**Other controls?**

Briefly describe:

None

**List what document(s) through which the controls will be implemented:**

CMLS-332, “Chemical Management Plan”.
CMLS-406, “Radioactive Materials Inventory Management Plan”.
Individual Integration Worksheets (IWSs).
### B362 RADIOLOGICAL INVENTORY

<table>
<thead>
<tr>
<th>Nuclide</th>
<th>Initial Quantity [activity or mass]</th>
<th>Units</th>
<th>Initial Activity [Ci]</th>
<th>Reference Date</th>
<th>Specific Activity [Ci/g]</th>
<th>Halflife [sec]</th>
<th>Decay Corrected Activity [Ci]</th>
<th>Final RQ [Ci]</th>
<th>RQ Fraction</th>
<th>Cat III Threshold [Ci]</th>
<th>Cat III Fraction</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-14</td>
<td>1.86E+04</td>
<td>uCi</td>
<td>1.86E-02</td>
<td>04/11/07</td>
<td>4.46E+00</td>
<td>1.81E+11</td>
<td>1.86E-02</td>
<td>10</td>
<td>1.86E-03</td>
<td>4.20E+02</td>
<td>4.44E-05</td>
</tr>
<tr>
<td>H-3</td>
<td>1.17E+04</td>
<td>uCi</td>
<td>1.17E-02</td>
<td>04/11/07</td>
<td>9.65E+03</td>
<td>3.90E+08</td>
<td>1.15E-02</td>
<td>100</td>
<td>1.15E-04</td>
<td>1.00E+03</td>
<td>1.15E-05</td>
</tr>
<tr>
<td>I-129</td>
<td>1.00E+00</td>
<td>uCi</td>
<td>1.00E-06</td>
<td>04/11/07</td>
<td>1.77E-04</td>
<td>4.95E+14</td>
<td>1.00E-06</td>
<td>0.001</td>
<td>1.00E-03</td>
<td>6.00E-02</td>
<td>1.67E-05</td>
</tr>
</tbody>
</table>

Inventory table represents the typical types and quantities of nuclides used within this facility, the exact types and quantities may change somewhat over time, however, total nuclide inventory will be maintained within LSI classification limits.