SNL - Life Cycle Materials Management Project
Chemical Management Process Recommendations
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Presented at the EFCOG CSLM TTG Meeting
10/20/2015 by
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1. Requested Decisions
2. Background
3. Methodology
4. Recommendations
   A. Graded Approach Working Group
   B. MAQs
   C. SDS Management
   D. Inventory Management
      1. Practices
      2. Program/ES&H
      3. Line
1. Requested Decisions

1. Approve working group to define graded approach for Chemical Management

2. Establish responsibility for management of Chemical MAQs and SDS

3. Define inventory management responsibilities and practices
2. Background

In Fiscal Year 2015, the objective of the Chemical Management Initiative component of LCMM was to:

1. Establish SNL chemical laboratory management practices as defined by line.
2. Clarify chemical management policy.
3. Validate chemical management policies meet regulatory requirements.
4. Gather requirements for information technology (IT) tool(s)
5. Complete a detailed plan for implementation of recommendations in FY16.
3. Methodology

1. Regulatory Requirements and Policy Gap Analysis
2. Structured Improvement Activities
3. One-on-One Interviews and Line Organization Group Sessions
4. Benchmarking Activities
5. Evaluate Industry and Governmental Chemical Management Practices
A. Establish working group to enhance our current Graded Approach to Chemical Management

1. Define hazard levels and other risk factors for chemical inventory
2. Apply criteria to chemical categories
3. Define the criteria for how to determine the hazard related to samples and synthesized chemicals and the process for handling (labeling, SDS, etc.)
4. Close policy gaps relating to decisions made on the above issues
4. Recommendations
Establish responsibility for managing MAQs

B. Maximum Allowable Quantities Constraint

• **Option A**
  - Provide line users access to MAQ information and allow the line to purchase chemicals without holds.
  - Notifications would be sent to owners and managers on MAQ violation and timeframe to correct.

• **Option B**
  - As-is state where FP reviews purchases against MAQ levels
  - Address any MAQ limitations on a building-by-building basis
4. Recommendations
Establish responsibility for managing SDS

C. Safety Data Sheet Management

Improve search capabilities during purchasing. JIT vendor to provide manufacturer SDS at time of purchase. Allow purchaser/line to upload SDS.

• Option A
  - Purchaser/owner responsible for associating the most accurate and compliant SDS with each purchase.
  - Notifications would be sent to owners and managers if no SDS is associated and timeframe to correct.

• Option B
  - Supplier will select SDS as part of delivery and CIS Program can change SDS association as necessary.
4. Recommendations
Establish responsibility for managing inventory

D. Inventory Management Practices and Responsibilities

• Practices
  - Develop static inventory practices clarification and changes. Review by graded approach working group.
  - Support centralized storage for Chemical Exchange chemicals and other chemicals as agreed to by line.
  - Improve disposition process communications.

• Program/ES&H
  - Develop and track measures and metrics.
  - Development of Guideline Document, revisions to policy and vetting of changes with Safety and Clearinghouse Committees.
  - Accountable for identifying and resolving regulatory compliance issues.
4. Recommendations
Establish responsibility for managing inventory

D. Inventory Management Practices and Responsibilities

• Line
  - Allow to upload multiple inventory changes to maintain accuracy of data (owner, location, expiration, TBD)
  - Annually reconcile chemical inventory. If approved can delegate to Program annual inventory. Reconciliation of discrepancies still line responsibility.
  - Define criteria for how and when to manage samples and synthesized chemicals.
Back-up Information
# Overall Process Flow

<table>
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<tr>
<th>Acquire</th>
<th>Manage</th>
<th>Dispose</th>
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<tr>
<td><strong>Start</strong></td>
<td><strong>Stop</strong></td>
<td><strong>End</strong></td>
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<tr>
<td>Plan Acquisition</td>
<td>Plan for material acquisition including disposition of waste.</td>
<td>Determine if NDU materials can be reapplied, reused or transferred.</td>
</tr>
<tr>
<td>Purchase</td>
<td>Obtain approvals for acquisition.</td>
<td>Determine if NDU material can be recycled.</td>
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<tr>
<td></td>
<td>Acquire chemical and biological materials.</td>
<td>Identify/characterize materials for disposition.</td>
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<td></td>
<td>Prepare for Use</td>
<td>Identify general disposition path.</td>
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<td></td>
<td>Receive and prepare material for use.</td>
<td>Prepare materials for disposal: package, label and accumulate.</td>
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<tr>
<td></td>
<td></td>
<td>Submit material for reapplication or disposal.</td>
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</tbody>
</table>

- **Acquire**:
  - Plan for material acquisition including disposition of waste.
  - Obtain approvals for acquisition.
  - Acquire chemical and biological materials.
  - Receive and prepare material for use.

- **Manage**:
  - Maintain accurate inventory of materials.
  - Work with materials safely and effectively.
  - Inspect materials.
  - Identify materials with no defined use (NDU).

- **Dispose**:
  - Determine if NDU materials can be reapplied, reused or transferred.
  - Determine if NDU material can be recycled.
  - Identify/characterize materials for disposition.
  - Identify general disposition path.
  - Prepare materials for disposal: package, label and accumulate.
  - Submit material for reapplication or disposal.
  - End
Manage Chemicals To-Be Process

1. **Prepare for Use**
   - Is item hazardous?
     - Yes: Prepare and implement a Technical Work Document (TWD) before working with the chemical. (ref. ESH100.2.ENV.3)
     - No: Item use/produced/analyzed new chemical compound(s) or analytical sample?
       - Yes: Process resulted in byproduct?
         - Yes: Assume byproduct is hazardous until determined otherwise (cmd 110 A1 D)
         - No: Synthesized item/analytical sample to be retained overnight?
           - Yes: Process does not apply
           - No: Maintain management tool as material status changes (expended, quantity, transferred, relocated, etc.) (ref. ESH100.2.ENV.27)
       - No: Material is highly hazardous?
         - Yes: Inventory Reconciliation
         - No: Monthly, notify owner inspection, and reconciliation is plus
2. **Expiration date updated?**
   - Yes: Manager approves new expiration date
   - No: Provide justification for new expiration date to manager (tool request #2)
3. **Item has defined use?**
   - Yes: Expiration date valid for defined use?
     - Yes: Monthly, notify owner inspection, and reconciliation is plus
     - No: Provide justification for new expiration date to manager (tool request #2)
   - No: Material is highly hazardous?
     - Yes: Inventory Reconciliation
     - No: Monthly, notify owner inspection, and reconciliation is plus
Manage Chemical To-Be Process

Division ES&H industrial hygienist conducts hazard assessment of synthesized material/analytical sample (rmnd II.F.3.1).

Hazard information extracted from Safety Protocol form to management tool db fields (rmnd II.E.8).

Create a Safety Protocol form, upload form to management tool (rmnd II.F.3.2).

Contact the TSCA SME. (ref. ESH100.2.H.18)

Will new chemical 1) be produced under a CRADA or WFO agreement, 2) have potential commercial purpose, or 3) be produced more than 100 kilograms/yr?

Yes

Create SDS for new material (rmnd II.A.5).

No

Division ES&H industrial hygienist conducts an exposure assessment (ref. ESH100.2.H.18).

Label new compound with identity, hazard warnings, and manufacturer/importer/responsible party. (ref. ESH100.2.H.4) (rmnd II.A.5).

Item is empty gas cylinder to be returned to vendor?

Yes

No

Item no longer needed but still usable?

Yes

Do not remove inventory item label; request container pick-up from vendor.

No

Vendor scans item, provides upload file to update management tool data.

Disposition and Preparation

End

Will chemical be exported?

Yes

Complete SF 2001 NEC, Notice of Export for Chemical Substances (ref. ESH100.2.H.18).

No

Export and update chemical management tool that material is no longer in inventory (ref. ESH100.2 ENV.27).
Results and Recommendations

A. Policy Gap Closures

1. Reference Worker Safety and Health Program Plan, PG470246, in ESH100.2.IH.4,

2. ESH100.2.IH.4 - require that byproducts of produced chemicals are assumed to be hazardous until properly evaluated

3. Update ESH100.2.IH.4 and ESH100.2.IH.18 for produced chemicals to define:
   • When SDS is required
   • Labeling of hazards, even when in small quantities
   • Time frame for hazard assessments
   • Communication of hazards to workforce
Results and Recommendations

C. Exceeded Maximum Allowable Quantities (MAQs)

1. Address issues building-by-building; strategies may include:
   - Inventory reduction
   - Movement of materials to other buildings or fire zones
   - Upgrade of building to create additional fire zones

2. Tool to create what-if scenarios to determine impact of new purchases

3. Provide line users access to MAQ information

4. Integrate chemical management, purchase request, and MAQ systems

5. Ensure chemical locations can be easily traced to Fire Protection zone designations
Results and Recommendations

D. Disposition

• Improve communication so users:

1. Understand what information is required on WDDRs
2. Are informed of changes that could affect their ability to dispose
3. Are aware a WDDR results in disposal or recycling
4. Know that ECCs can assist in the WDDR process
5. Clarify instructions for packaging for disposal requests
Results and Recommendations

E. SDS Management - Short Term

1. Recommend identification of SDS when planning a material purchase
2. Improve search capability for selecting SDSs during purchasing
3. Require JIT vendors include digital manufacturer SDSs in the upload file
4. Associate same SDS used at purchase as SDS of record when received
5. Warn user when purchasing that a manufacturer’s SDS is better than a generic SDS
6. Allow additional users to upload manufacturers’ SDSs and related data
Results and Recommendations

E. SDS Management - Long Term

6. Investigate commercial SDS services
7. Automate upload of SDS hazard information
Results and Recommendations

F. Inventory accuracy - General

1. Drive compliance through measures and metrics
2. Investigate root cause of inventory accuracy anomalies for continued improvement
3. Study feasibility of centralized storage and use of chemical coordinators
4. Establish physical repository for Chemical Exchange
5. Allow line users to upload multiple inventory changes
6. Investigate commercially available chemical management tools
7. Expand static inventory to biological materials
F. Inventory Accuracy - Static Inventory

1. Update ESH100.2.ENV.27 to clarify relationship between static inventory not-to-exceed quantities/volumes and MAQs
2. Include static inventory in Chemical Laboratory Management Guidelines
3. Require inventory update when static inventory is moved
4. Establish process to allow users to
   - Request new static inventory items
   - Request increases in not-to-exceed quantities
Results and Recommendations

F. Inventory Accuracy - Static Inventory
5. Verify static inventories do not exceed MAQs
6. Allow line users access to queries used by ES&H SMEs
7. Standardize process to review SDSs regardless of type of inventory
F. Inventory Accuracy - Samples and Synthesized Chemicals

1. Graded Approach working group to:
   - Define the criteria for samples and synthesized chemicals inventory
   - Determine time frame for hazard assessments and communication

2. Create a Safety Protocol in lieu of an SDS for hazard communication/documentation
Key Next Actions

1. On-board staff to support material management program - 11/2015
2. Define graded approach and procedures for managing samples and synthesized materials - 12/2015
3. Establish excess inventory stockroom - 1/2016 (contingent on funding)
4. Validate and approve to-be process flows - 2/2016
5. Implement various CIS and ChemPRO changes to address SDS short term recommendations, CEO and static inventory management improvements - TBD
Key Next Actions

7. Complete remediation plans for exceeded MAQs by building - 4/2016
8. Verify cumulative not-to-exceed quantities in locations with static inventory do not exceed MAQs - 4/2016
9. Update policies and procedures to close gaps and reflect to-be process changes - 6/2016
10. Detail tool requirements including long-term recommendation for SDS management - 8/2016