Requirements Management Overview & RMS Database Demo

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Agenda

• Overview of LBNL Reqs Mgmt Program 10 min
• LBNL Policy Manual (RPM) 10 min
  – Platform, structure
  – Demo
• LBNL RMS Database 25 min
  – General info
  – Structure, capabilities
  – Associations (relationships)
  – Deliverables
  – Demo
  – Summary comments
LBNL Requirements Management (RM) Program

Translated from Contract 31 and related standards and regulations, the Lab’s policies and procedures define the operating framework for Laboratory community members to successfully produce outputs that are on time, within budget, and of high quality.

- **RM Program**: Implementation of a Lab-wide system that simplifies the task of finding, understanding, and implementing requirements, comprising:
  
  - A process to manage new/changed requirements through implementation (**DEFINITION**).
  
  - A hierarchal structure describing the relationships among institutional requirements, documents, and information. (**TRACEABILITY**).
  
  - A process for tailoring institutional policies and procedures to allow end users to effectively & efficiently meet requirements. (**ACCURACY** and **USABILITY**).
Mapping: Flow-down and Processes

1. Clear Definition
2. Traceability
3. Accuracy Usability

FIND + UNDERSTAND + ACT ⇒ TIMELY RESULTS

Pre-C31
- Added efforts starting 2/2013

In C31 (RM Program)
- Focused efforts since 11/2010

Contract 31 Requirements

Lab Policies

Lab Procedures

DOE, State, Local, UC, etc.

Monitor Process

Contract Change Process

Requirements Management Process

Document Management Process

RM Database
Tailoring a Program for Customers: Challenges

• Transitory population (nearly 50%!!)
  – Need **FIND** + **UNDERSTAND** quickly to convey the essential requirements for work
  – But: Documents not always readily available nor easy to read.

• Centralization & Standardization:
  – Necessary for efficiencies and cost; sets up quick find for transitory folk
  – But requires all of Ops+ to play by the same rules:
    • Counter to culture of independence & creativity
    • No Lab precedent for an all-encompassing system
RM Program Key Elements

OBJECTIVE:
Organized searchable, findable info for Users

Requirements Management Committee
- Manage Definition
- Champion Accuracy, User-Friendliness

Reqs Mgmt Process
Doc Mgmt Process

RM Database with Work Flows
- Capture metadata for tracking & traceability
- Help Users navigate process
RM Committee: 
Manage Definition 
Champion Accuracy, User-friendliness

Committee Charter:
Provide **centralized** coordination and communications on Contract 31 requirements and related Lab policy matters.

Committee representation:

References:  
**RM Governance, 04.04.001.002**  
**RMC Charter**
RMC Representatives: Roles & Responsibilities

- Within Division or Department (or functional assigned responsibility area), coordinates Division’s or Department’s responsibilities on requirements, policy, and related institutional matters. Serves as the Division or Department expert on the institutional RM and document management processes. Applies and promotes the institutional RM and document management processes within the functional assigned responsibility area.

- Serves as the Division’s or Department’s point of contact to the Laboratory’s RM Program as a member of the RMC.

- As delegated by his/her appointing Sr. Line Manager, has authority to accept RMC actions or assignments on behalf of his/her respective functional area.

- With support of the Sr. Line Manager, can assign policy/requirement-related tasks to divisional SMEs, and drive for completion. Typical tasks include application of expertise to analyze or interpret a DOE directive, Contract requirement, regulation, in terms of impact on institutional programs, processes, practices.

- Serves as “first pair of eyes” to provide quality assurance review of Lab policies or requirement-related analyses. Reviews information with a cross-functional view and for consistency and completeness per RM program guidelines. Follows up with SME or author as necessary to ensure written message is accurately communicated. May recommend and then assist facilitating additional inputs (RMC, respective Sr. Line Manager, other Laboratory standing committees, etc.)

- As a member of the RMC, actively participates in identifying, developing, supporting and improving the institutional RM processes. “Support” can include, for example, coaching/teaching others, demonstrating through practice, being an advocate, and so forth.

- Applies leadership and collaborative skills in working with SMEs, Working Group members, the RMC, other Laboratory standing committees. Champions, facilitates, and practices cross-functional collaboration.

- Consistently attends and participates at RMC meetings. If absence is necessary, is responsible for finding alternate.

- Communicates actions and/or assignments to respective Sr. Line Manager on regular basis.
Sr. Line Manager RM Responsibilities

- Has responsibility and accountability for managing Laboratory requirements that pertain to his/her area of responsibility, including identification of what the requirements are and implementing them through policies, programs, procedures, etc.
- Has responsibility and authority to define and implement changes in policies, programs, procedures, etc. resulting from changes to Contract 31, UC requirements, and to applicable federal, state, local laws and regulations, as well as any direction provided by supplementary letters or memos from DOE or UCOP.
- Has ownership and accountability for the technical content, accuracy and completeness of respective Function's documents. Approves institutional documents upon completion of required reviews.
- Ensures compliance with LBNL requirements and document management policies and procedures.
- Communicates to the RM PM and RMC objectives and general guidance on implementation for the policy under question.
- Reviews and approves policy and detailed implementation plans recommended by a Working Group and the RMC. Approval implies commitment of resources and funding for coverage of his/her function. For those cases where multiple functions are participating, approvals must be obtained from each participating function.
- Has responsibility for execution of approved plans for implementing mechanisms supporting a Laboratory requirement or policy, including assigning resources and funding.
- Works with the RM PM and RMC to resolve issues that may arise in the process of review and translation of requirements, policy into implementation.
RM Process and Tools

RM Process:
- Open RM Case
- Assess complexity
- Analyze risks
- Plan implementation
- Execute Plan
- Use cross-functional Working Group(s)
- Close RM Case

RM Process Tools:
- Significance Rating
- Impact Analysis
- Implementation Plan Checklist
- ROD
- Approvals

RMC Mgmt Tool:
- Contract Mod tracker
- Policy Change tracker
- Other trackers, as needed

Applied to:
- Institutional requirements, policies, documents
  - Recommended for Division/Function documents
- Pre-C31, In-C31

References:
- RM Process, 04.04.001.003
- Doc Mgmt Process, 10.06.001.001


Smartsheet collaborative spreadsheet
www.smartsheet.com
Vision: Documents & Flowdown - Search, Find, Traceability

Contract 31, Standards, Regulations, Contracting Manager Policies (UC)

**Lab Driving Requirements**
See list of examples.

- Contractor Assurance System (5520)
- Worker Safety & Health (3851)
- Site Security Plan
- Operations & Quality Management Plan (3111)
- ISM (3140)
- Radiation Protection Program
- Others

**Policy Manual**
- Institutional Taxonomy (Tree/Map)
- Institutional Glossary A to Z
- Key word search

**Lab-wide Policies**
- Lab-wide processes, procedures, other implementing docs

**Note:**
Policies & procedures may draw from more than one authority.
Vision ➔ Tangible: Wiki-RPM

- Project start: April, 2011
- Open to public: April, 2012
- Use Lab Commons platform
- 300 unique policies
  - Encompassing ALL Operations
  - Organized in 12 sections, 79 policy areas
  - Comprised of Brief, detailed Policy, Document Information
  - About 85% converted end FY13
- Institutional Glossary
- Multiple ways to search
- Demo! - [https://commons.lbl.gov/display/rpm2/Home](https://commons.lbl.gov/display/rpm2/Home)
RMS Database Detailed Overview

• Development
• Database scope
• Relationships
• Workflow
• Deliverables
• Examples/Demo
RMS Database – Development History

- Developed by Ovitas ([www.Ovitas.com](http://www.Ovitas.com))
- Project Milestones & Costs

<table>
<thead>
<tr>
<th></th>
<th>Development</th>
<th>Maintenance/ License (annual)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project initiated</td>
<td>10/2011</td>
<td></td>
</tr>
<tr>
<td>1st Release</td>
<td>11/2012</td>
<td>$170K</td>
</tr>
<tr>
<td>2nd Release (deliverables)</td>
<td>11/2013</td>
<td>$45K</td>
</tr>
<tr>
<td>Minor ease-of-use fixes</td>
<td>09/2014</td>
<td>$9K</td>
</tr>
</tbody>
</table>

- Support outsourced to Ovitas – $225/hr
- 3 Environments: Production, QA, Development
- Application Layer → Database Layer (Oracle)
- LDAP access
Database Top Level Requirements

• Overall Objectives:
  – Track changes to DOE Contract 31 and associated requirements that the Lab is obliged to follow
  – Show traceability of requirements through the Lab’s implementing documents (policies, programs, processes, procedures, etc.)

• Manage entry, maintenance, search, reporting of:
  – Requirements metadata
  – Document metadata
  – Records of Decision (RODs) on Reqs and Docs
  – Interrelationships of the above

• Manage tracking of Contract Deliverables including notifications and completion.

Reference: RM Database System Requirements Specification, 04.04.001.004
RM Database Application: Tracking, Traceability

- **Deliverables Repository (Word-docs)**
  - Deliverables metadata
  - Manual exchange

- **Berkeley Site Office Deliverables Database**
  - Deliverables metadata
  - Manual exchange

- **Work Planning & Control Application System**
  - Doc metadata
  - Auto, linked

- **Operations Functions’ document databases**
  - Doc metadata
  - Manual exchange

- **Requirements Management Database System**
  - Requirements metadata
  - Doc metadata
  - Tagging
  - View
  - *Case data entry
  - *Case reports
  - **Reports

- **Case tracker Actions, RODs, attachments**
  - *Data entry

Note:
* = Limited Access
** = 2 levels of access (admin, casual)
RMS Data Definitions:
Requirement and Document Concept Types

**REQUIREMENT Concept Types**

- Driving Requirements
- Child “component” Requirements
  (specific section or paragraph of Parent/"main")
- Embedded Requirements
  (required by reference)
- Fed, State, Local, UC
  controlled policies, forms,
  websites, etc.

**DOCUMENT Concept Types** (Lab-controlled)

- Policies
- Processes
- Programs
- Lab Driving Req Docs
- Plans
- Procedures
- Forms
- Websites
- Manuals

"Concept": An object that is stored in RMS. It is comprised of properties (title, date, owner, etc.) which include designated relationships (associations).
RMS Data Relationships: Some possibilities

- Lab Driving Req Doc
- Embedded Req
- Lab Req
- Lab Policy
- Program doc
- Procedure
- Lab Form
- External Website
- Lab Form
- External form

A relationship ("association") is a property of each of the affected concepts. No other data is shared or can pass from one to the other. This means that if a parent Req is modified, and it has a Child, the Child must be separately modified.

Note: This illustrates only some of the req → doc, req → req, doc → doc, doc → req relationships that can be set up within RMS. A chain of these establishes a hierarchy.
Case Associations Capture Change Histories

Case: A focus or topic – usually associated with a change to a requirement and/or policy and/or program. An “instance” where RM process is applied.

“wf” = workflow = sequence of steps to enter or modify a record’s data
RMS design accommodates mid-level users (SMEs)

- Owners of Late Actions
- If POLICY, RMC is alerted at Case/Initial
- If POLICY, RM PM, CSO Editor, RMC at Doc/Develop, Approve, Finalize
- For non-Policy, RM PM, RMC Function Rep are alerted at each Case step

Long term objective is for SMEs (policy owners, Inst. Doc owners) to enter & track own data with monitoring via alerts
RMS Database - Deliverables

CREATION:

User enters:

(Child) Req info + DelivDef info
Req A due annually

Req concept

RMS generates

Req A 2/1/2011
Req A 2/1/2012
Req A 2/1/2013
Req A 2/1/2014

Open DelivDoc WF concepts

RMS alerts!

Deliv owner closes wf

Req A 2/1/2011 Due!

Req A 2/1/2011 Closed!

Note: Modifying Child Req/DelivDef info results in update of any OPEN Deliv wf. Closed Deliv are not changed (good!)

DATA & RELATIONSHIPS:

Notes:
- The different concept types are searchable.
- Relationships between Child Req & generated DelivDoc wfs & Closed wfs remain established, when Child Req is modified.
- Must update Parent & Child Reqs separately.

RMS Database

Req concept

(Child) Req info + DelivDef info
Req A due annually

Req concept

Manual

Converted to
Closed Deliv
concepts

Converted to
Closed Deliv
concepts

Remaining
Open Deliv
wf concepts

Remaining
Open Deliv
wf concepts

auto

parent

child
RMS Database Output Example

- The RMS database is intended to answer such questions as:
  - If DOE Order xxx changes, what Lab documents might be impacted?
  - What documents support Policy Z?
- The data derives from Policies (SRD, Implementing Docs)
Last Comments: LBNL RMS Database

• Usage is low
  – RM PM, RMC members enter data
  – RM PM, RMC, Internal Audit, DOE/Berkeley Site Office, others search

• Highest value observed so far:
  – Tracking/reminding Contract deliverables!
  – Requirements change histories via Contract Mods
  – Policy management
  – Traceability reqs → policies → programs

• Shortcomings:
  – Managing names
  – Not quite sufficiently intuitive for non-technical folk
Extra info on LBNL RM
## Important RM Links

<table>
<thead>
<tr>
<th>Item</th>
<th>Access</th>
<th>Link</th>
</tr>
</thead>
<tbody>
<tr>
<td>RPM</td>
<td>Lab A-Z ; Home page , or Requirements and Policies Manual (RPM)</td>
<td><a href="https://commons.lbl.gov/display/rpm2/Home">https://commons.lbl.gov/display/rpm2/Home</a></td>
</tr>
<tr>
<td>RMC Charter</td>
<td>Lab A-Z: Requirements Management PROGRAM web page. Select from left panel menu</td>
<td><a href="http://www2.lbl.gov/DIR/OIA/OCA/reqs-mgmt-prog-charter.html">http://www2.lbl.gov/DIR/OIA/OCA/reqs-mgmt-prog-charter.html</a></td>
</tr>
<tr>
<td>RMS database</td>
<td>Lab A-Z: Requirements Management PROGRAM web page. Select from left panel menu</td>
<td><a href="https://rms.lbl.gov/atongui/">https://rms.lbl.gov/atongui/</a> [NOT Web accessible]</td>
</tr>
<tr>
<td>Policy Change Tracker</td>
<td>Smartsheets – RMC Workspace</td>
<td></td>
</tr>
<tr>
<td>Policy Change Tracker form</td>
<td>Smartsheets – RMC Workspace Or, RPM Home page/Updating RPM</td>
<td><a href="https://app.smartsheet.com/b/form?EQBCT=db758e3760544314a1ff9b16b70e390d">https://app.smartsheet.com/b/form?EQBCT=db758e3760544314a1ff9b16b70e390d</a></td>
</tr>
<tr>
<td>Contract Mods Tracker</td>
<td>Smartsheets – RMC Workspace</td>
<td></td>
</tr>
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</table>
Significance Rating (04.04.001.206)

1. Check the Boxes:

<table>
<thead>
<tr>
<th>Brief description of what is being analyzed:</th>
<th>Value</th>
<th>1</th>
<th>2</th>
<th>3</th>
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</thead>
<tbody>
<tr>
<td># Policy Area(s)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># Divisions affected</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td># of people</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Risk area (safety)</td>
<td></td>
<td></td>
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<tr>
<td>Risk area (business)</td>
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<tr>
<td>Risk area (compliance)</td>
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</tbody>
</table>

2. Sum, divide, get Impact # and Imp #

3. Determine intersection of the 2 numbers

4. Minimum Level of Approvals

5. Minimum Expectations for Project/Program Execution

**TABLE 1: Approvals:**

<table>
<thead>
<tr>
<th>Significance Rating</th>
<th>Approval</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Lab Director (or designee)</td>
</tr>
<tr>
<td>B</td>
<td>COO (or designee)</td>
</tr>
<tr>
<td>C, D</td>
<td>Sr. Line Manager(s)</td>
</tr>
<tr>
<td>E</td>
<td>Sr. Line Manager (or designee)</td>
</tr>
</tbody>
</table>

**TABLE 2: Minimum Required Program Elements**

<table>
<thead>
<tr>
<th>Significance Rating</th>
<th>Minimum Required Program Elements</th>
</tr>
</thead>
</table>
| D, E                | - Document gap analysis and comparison to current implementation m
|                     | - Select approach with input from users
|                     | - Develop specific communications strategies, including methods, target and venues. Document details (who, how, where, when) in Implementing Mechanisms
|                     | - Draft program/policy change for review
|                     | - User review/input as needed
| C                   | - Establish a cross-functional Working Group whose main charter is to:
|                     |   any analyses and planning, including review of all affected documents evaluation and selection final implementation
|                     |   Document gap analysis and comparison to current implementation m
|                     |   Benchmark (telephone calls and e-mails may suffice)