



# **LBLN Requirements Management Program Summary and FY2014-15 Plans**

Requirements Management Committee  
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## **Executive Summary:**

The LBNL Requirements Management (RM) Program is a major component of the Laboratory's Contractor Assurance System (CAS). It oversees the system and processes for translating Contract 31 and UC requirements into Laboratory policies, programs, and procedures that its workforce can use to effectively and efficiently meet the needs of its customers and stakeholders. The RM Program was first initiated in late 2010, and its RM Committee (RMC) will be completing its first three-year Charter in May, 2014.

The RM Program is well underway. Its effectiveness and value arise from centralized coordination and a system of institutional processes that have brought improvements to the Laboratory's overall quality in managing requirements.

- All Contract requirement owners are held to the same expectations for addressing changes to requirements.
- Completion of the Laboratory's Contract deliverables is tracked.
- The Laboratory's policy manual (RPM) was re-structured and continues to be maintained under the direction of the RM Program.
- The RM processes are straightforwardly applicable to all business disciplines.
- The RMC members are the points of contact on requirements-related and policy-related matters.
- Overall, the formalization of processes to manage requirements gives the Laboratory the means to measure its performance and to present evidence of compliance in requirements-related matters.

The RM Program practices have a good foothold in the Laboratory's Operations divisions given the youth of the Program. However, more time and work are needed to build a stronger base where a critical mass of divisions is practicing the RM processes regularly and with little direct help from the Program. To increase the certainty of sustainability, we recommend continuing the current Program course for at least another 3 years, with emphasis on coaching divisions and departments on both requirements management and document management processes and best practices for integrated/collaborative efforts and document readability, accessibility and currency.

## LBNL Requirements Management Program Summary and FY14-FY15 Plans

### 1. Purpose:

This document summarizes the progress of the Lawrence Berkeley National Laboratory Requirements Management (RM) Program from its inception in November, 2010, and presents Program recommendations for the next few years. It provides supporting information for the renewal of the Requirements Management Committee (RMC) Charter, due May, 2014.

### 2. Introduction

The LBNL Requirements Management (RM) Program is a major component of the Laboratory's Contractor Assurance System (CAS). It oversees the system and processes for translating Contract 31 and UC requirements into Laboratory policies, programs, and procedures that its workforce can use to effectively and efficiently meet the needs of its customers and stakeholders. The RM Program has three main elements:

- A RM process to manage new or changed requirements,
- A business (or database) system to manage and trace the relationships among Laboratory requirements, policies, programs, and other institutional documents and information,
- A document management process for managing Laboratory policies, programs, and procedures.

As noted by the list of key development milestones in Table 1, the Program is relatively new at the Lab. The term of its Committee's first charter ends May, 2014. The RM Program, like other institutional programs, strives toward sustainability and effectiveness over the long term. To achieve these, the RM Program must provide value to the Laboratory (effectiveness) in an efficient way. For sustainability and for efficiency and effectiveness, the Program's processes must be easily adaptable throughout the organization so that they can endure beyond the tenures of individual RMC members. The remaining sections of this document demonstrate that the RM Program even in its earliest life has impacted and provided value to the institution. However, though it appears to be on a good trajectory towards sustainability, the Program needs more time to achieve critical mass of adoption.

**Table 1:** RM Program Development Major Milestones

Milestone	Date
Plan for Program completed	November, 2010
RPM (Policy Manual) construction initiated	May, 2011
RM Committee (RMC) chartered	June, 2011
RMS database development launched	September, 2011
RPM "go-live" with 50% conversion	April, 2012
RMS database "go-live", including Contract Deliverables tracking	November, 2012
Program effectiveness review completed	February, 2013
Program scope expanded to include pre-Contract 31 process oversight	February, 2013

### **3. Requirements Management Committee (RMC) – People and Processes:**

The LBNL RM Program is led by an oversight committee (RMC) and system of processes, coordinated and guided by a RM Program Manager.

**3.a. People:** The Requirements Management Committee (RMC) has met monthly since it was first chartered in June, 2011. The initial composition included representatives from all Operations Divisions (Facilities, Human Resources, EH&S, OCFO, Public Affairs, IT) and RIIO, Tech Transfer, and OCA. Engineering representation was added mid-2012, and Protective Services provided its own representative when it split from EH&S in 2013.

Stable membership (effectively no turnover) of the Committee for two years (until summer, 2013) was a major reason for the development and spreading of the key RM processes and practices across and into Operations, and the relatively rapid development and release of the revised RPM (Policy Manual). Further, the RMC members embraced the purpose and mission of the RMC to effect change in matters related to managing and implementing requirements. This meant that the members were highly motivated to participate in the Program. They each recognized that cross-functional cooperation is key to the Lab's, the respective divisions', and the RM Program's success. The members coalesced into a highly collaborative cross-functional team. Finally, the RMC members have been recognized leaders in their own right within their divisions, and combined with responsibilities and authorities from their division directors, were quite effective in gathering inputs and efforts from SMEs (subject matter experts). The relatively uninterrupted two-year collaboration has provided the RM Program a good foothold in most of the individual Operations functions, thus beginning the foundations for a cultural shift in managing requirements and institutional documents.

Between July and November, 2013, the RMC had four changes of representatives (OCFO, Engineering, Facilities, HR). February, 2014 brought the departure of a fifth long term RMC member (IT). To date, the transitions seem to be going smoothly, a reflection on the staying power of the RM processes and RMC culture. The current RMC members believe that the committee model is working, and will be proposing a renewal Charter that retains almost all of the original intentions of the 2011 Charter.

The RMC opened its monthly meetings to Berkeley Site Office participation in mid-2012, and realizing the value gained, we extended the invitation to UCOP LMO in October, 2013. All three organizations seem to be finding value in these opportunities for dialogue on how to strengthen our partnering on management of requirements matters and to increase our understandings of the challenges that the other organizations face.

**3.b. Processes:** The original scope of the RM Program focused on the development and establishment of a system to manage Contract 31 requirements and their flow-down into the Lab's policies and programs. Keeping within the overall objective towards sustainability and effectiveness, the RM processes are based on a set of process principles, including:

1. Applying a graded approach with levels defined by a simple tool (known as "Significance Rating")
2. Performing analyses focused on impact, risks, and costs to implement.
3. Producing policies and other institutional documents that are readable, accessible and current.

4. Managing and communicating change.
5. Keeping responsibility for content and implementation in the hands of the divisions. The RM Program and RMC advise and recommend, but do not set policy or drive implementation plans or schedules, or commit resources or costs.

The first and second address efficiencies, helping frame level of implementation effort so that resources can be effectively applied. The third drives for outputs that have value for users, and is exemplified by the Requirements and Policies Manual (RPM). The fourth is critical for sustainability: maintaining accuracy, currency, and execution of our requirements and institutional documents. The last is important to both sustainability and effectiveness, and we seem to have demonstrated fairly well that it is very possible to drive and influence the organization on process without overstepping bounds of subject matter expertise or divisional management responsibilities.

In Q3FY13, the RM Program scope was broadened to encompass facilitation of pre-Contract activities to allow Lab evaluation and feedback on impact and implementation risks for proposed DOE contract changes. The July 2013 personnel changes in UCOP emphasized the need to document the what, when, how of critical handshakes and communications. We are currently working with both UCOP LMO and BSO to streamline communications, including identifying SMEs and ensuring timely quality responses.

Overall, these process principles can be universally used or adapted by the Laboratory functions and divisions. Nearly all of them are applicable to pre-Contract activities, too. Implementation of the principles is giving rise to a “common language”<sup>1</sup> that is helping cross-functional RM communications. The RM processes are accessible to the Lab community through the RM Program website.

**3.c. Evidence - some numbers or specific examples:**

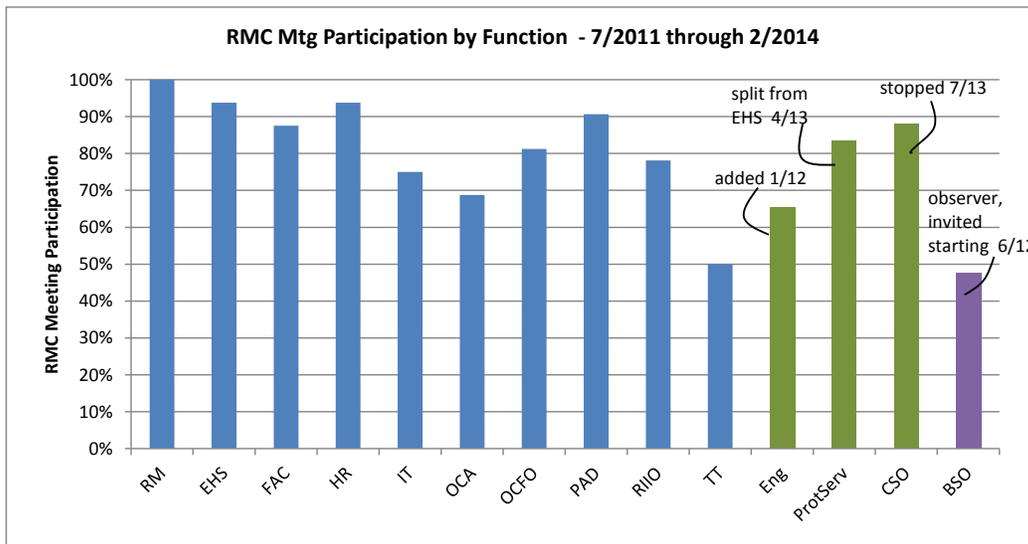
*3.c.1. Contract 31 Mods processed:* Since early 2012, over 120 line item changes in the Lab’s DOE Contract 31 have been processed under RMC’s guidance. These include all the changes from the BSO-UCOP-LBNL Contract Reform initiative, including DOE directives and H and I clauses. Modifications include addition, revision, and deletion of requirements, all of which can have impact on Lab policies, programs, processes, and Contract deliverables. The RM process objectives include making sure the change is acknowledged, assessed, and addressed in programs, policies, or documents as needed by the responsible Division.

*3.c.2. RM “cases”* are the Program’s means to manage changes to institutional requirements, policies or programs. Whereas complex changes (for example, limited smoking policy, events policy) may take time to complete (6 months to a year is not uncommon), tracking and reviewing the status of cases on a monthly basis seems to have improved the quality of the outcomes, particularly where a lot of socialization (for example, Personal Protective Equipment (PPE) program and limited smoking policy) or where cross-functional collaborations (for example, events, alcohol) are needed.

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<sup>1</sup> Some examples of terms whose frequency of use is increasing: significance rating, major/minor/editorial, impact analysis, implementing document, source requirements document

3.c.3. *Participation.* As noted above regular participation by RMC members has been key to its outputs. Figure 3-A illustrates the percent participation by division/office for the period July, 2011 to February, 2014.



3.c.4. *Influence/Impact:* Important for sustainability is that a whole organization’s behavior is aligned (or beginning to align) with a Program’s processes and intentions. Since a large organization can take a while to change its behaviors (that is, culture), we look for signs and rates of adoption by the groups making up the organization. We do have evidence of adoption or RM processes at the division level at Berkeley Lab.

For example, EH&S Division as the first adopter and partner, has applied nearly all the basic RM processes to the rewriting of its ESH Manual (PUB-3000). OCFO completed conversion of its policies first, and has since been an active participant in the upkeep of its policies, but has also proactively initiated improvements for usability by its customers.

Both these two large Operations divisions had immediate needs to apply the RM processes. Learning, buy-in, and therefore, staying power are best when an organization is ready or needs to engage. Several recent additional possibilities for “just-in-time” training have been identified. The current Fire Protection Program Corrective Action Plan (CAP) offers multiple opportunities to practice collaborative development and implementation of processes and procedures to Facilities and Protective Services. Engineering is launching a process improvement initiative, tightening up its practices in managing project/technical requirements, and adapting the style of the Policy Manual.

As noted already, certain terms and practices introduced by RM seem to be catching hold in multiple divisions. For example, there is not only a growing common understanding of what a “significance rating” is, but also what a high/low rating implies for expectations for project execution and for approvals.

**3.d. Recommendations and Focus FY14-15 (RMC and RM Processes):** The outputs of the first 3 years of Berkeley Lab's RM Program have focused on developing processes and tools for the Program, and initial application of these in Operations. Though Operations Sr. Managers have been very supportive of the RM Program, depth of adoption by the ranks in the several functions is still varied. EH&S and OCFO have the highest adoption, while the other functions continue to make progress but still require RM Program coaching. To achieve sustainability for the long term, Operations must achieve critical mass of adoption of RM processes. Therefore, we recommend:

- Continuing the RMC with minor changes to its Charter.
- Continue coaching Divisions, Departments to adopt and apply RM and document management processes and best practices for integrated/collaborative efforts, document readability, accessibility, and currency.
  - Via RMC and several high level cross-functional corrective action plan (CAP) initiatives to raise adoption level in Facilities, Protective Services, and HR.
  - Via select projects to raise adoption level in Engineering.

As we continue to coach and train at the divisional and departmental levels and as we continue our efforts with our counterparts in UCOP and BSO, we must also:

- Continue improving processes for effectiveness, added value, efficiency.
  - RMC should review and revise as needed all processes, templates written in 2011. This review cycle is consistent with the requirement set forth by the Program to review institutional documents at least every 3 years.
- Continue solidifying the RM processes and practices amongst RMC/UC/BSO and at the institutional level (Policy Manual, other institutional programs)

#### **4. LBNL Requirements and Policies Manual (RPM):**

**4a. General:** Whereas Contract 31 presents requirements for Berkeley Lab, the Lab's RPM policies interpret and translate the contract requirements into expectations for the many individuals who work at or visit the Lab. In the years just prior to the start of the RM Program, oversight of the RPM was sporadic and with little attention to consistency in presentation, accuracy, or currency, and not all Lab policies could be found in the RPM. Remake of the RPM became a foundation and most tangible output of the RM Program. The project offered an excellent first opportunity for cross-functional cooperation in ways not typical in recent Lab history. The revision and re-structuring efforts called for disciplined collection and then uniform presentation of the flow-down from requirements to Lab policies to implementing documents. These efforts also asked SMEs to write clearly and accurately, with focus on what readers are being asked to do, rather than writing discourses on why. Lastly, there was recognition and acknowledgement that some policies cross functional lines and therefore need to be reviewed by multiple groups. The making of the new RPM was very much driven by the catchphrase: "Find + Understand + Act → Timely Results."<sup>2</sup>

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<sup>2</sup> This catchphrase was taken from Sandia and modified to suit Berkeley Lab's culture.

In 2010, rather than continuing with the html technology or spending money and effort on custom software, a working RM group (predecessor of the chartered RMC) turned to the wiki-based platform (dubbed by IT as the “Laboratory Commons”) and its features and capabilities to house the RPM. At the time of its selection, the Commons was still in beta test at the Lab. Further, our intention to structure a large document was an atypical use case for the wiki-based platform, but we determined that we could succeed with relatively modest design effort. RPM development costs were thus limited to CSO (Creative Services Office) labor to design and set up the framework for the RPM – we did not have to spend any funds or efforts on the customization of the application itself.

The wiki-based platform has a number of key advantages that the older RPM did not have:

- It offers version tracking, which allows comparisons between current and previous versions, letting us to answer relatively quickly questions such as: what was published on a given date?
- It offers improved search, though the real enabler for easy searching is putting all 300 or so policies in one place.
- It offers automatic measurements of page hit rates.
- The application’s capabilities and features are relatively straightforward to use – design and maintenance can be accomplished with almost no special training.

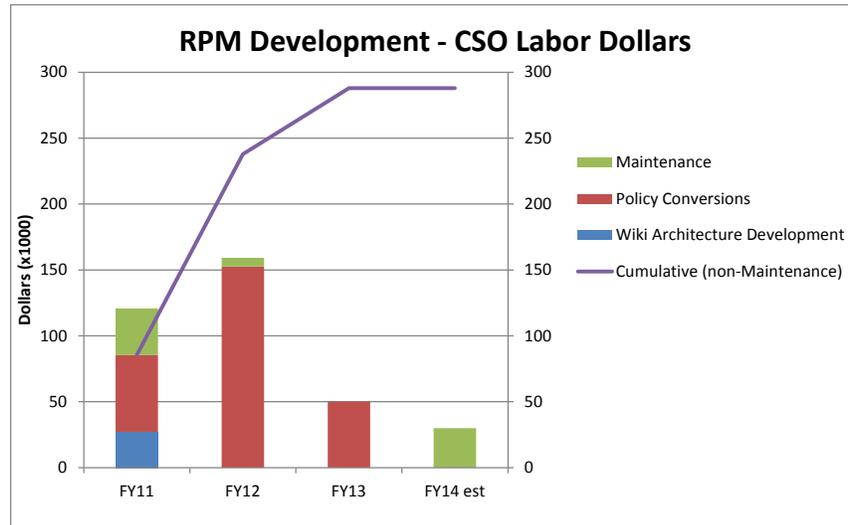
The wiki RPM was designed for reader ease of use. The RM working group devised the categories and RPM structure that are user oriented and take advantage of the ability to associate a policy with different categories. The group adopted the UC Berkeley concept of a policy brief for its user-friendliness, though the biggest benefit of this approach was that it allowed early launch of the RPM without immediately converting all the contents. The policy tab structure supported by the wiki-application provides a means to allow emphasis on the policy without the reader becoming encumbered by information about the policy. Unlike the older RPM, each policy’s driving requirements and any supporting programs, procedures or other documents are listed should the reader be interested. That is, each policy carries the flow-down from requirements toward implementation.

With approximately 88% of the policies converted to date, the wiki-based RPM is considered to be in maintenance mode. The RPM change process complies with document control requirements, and has been in practice for more than a year. SMEs (including RMC representatives) provide approved proposed changes to policies, the Lab’s Creative Services Office (CSO) edits and publishes the changes as coordinated by the RM Program Manager assisted by RMC members. In keeping with institutional policy that every policy be reviewed at least once every three years, approximately 80 policies have been reviewed and updated since spring, 2012. The RPM is considered an institutional document that must be formally submitted per DOE’s archives and records requirements. To keep the RPM maintenance budget as low as possible, the preparation of the annual “snapshot” for submission to Archives and Records is performed by OIA/OCA staff rather than CSO staff. CSO must still provide any searches of archival information dated prior to 2012.

**4.b. Some data about the RPM:**

4.b.1. *RPM Costs:* Figure 4-A shows the costs for development of the wiki-based RPM from September, 2011 through September, 2013, and the estimates for FY14 are primarily maintenance costs. The Creative Services Office edits and publishes changes to the RPM as coordinated by the RM Program Manager assisted by RMC members. The maintenance budget to cover CSO’s efforts is managed by OIA/OCA, and is about \$30K per year.

**Figure 4-A**



4.b.2. *Conversion to the wiki-based RPM:* Figures 4-B and 4-C illustrates the progression of policy conversions from 2011 through 2013. To date, the bulk of unconverted policies (approximately 40) belongs to HR.

**Figure 4-B**

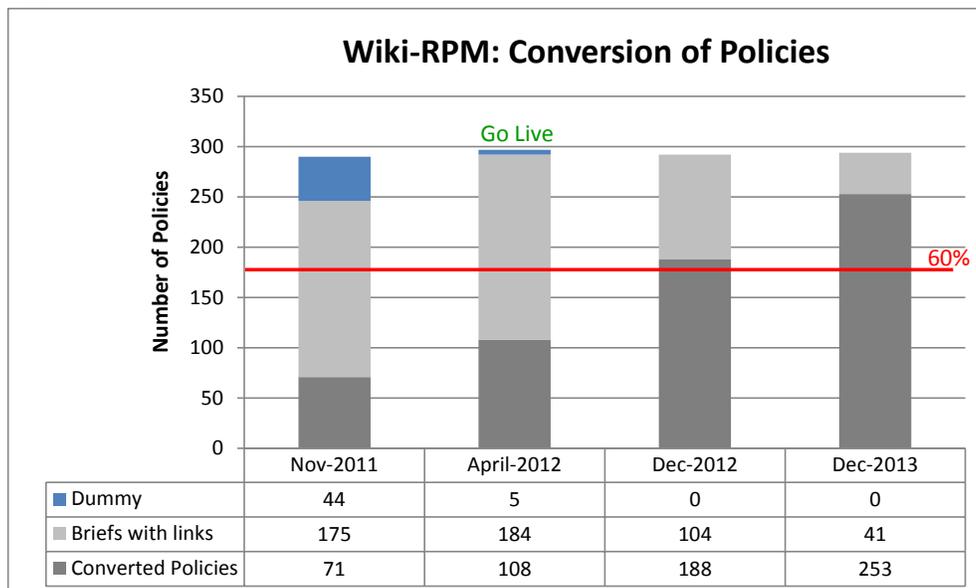
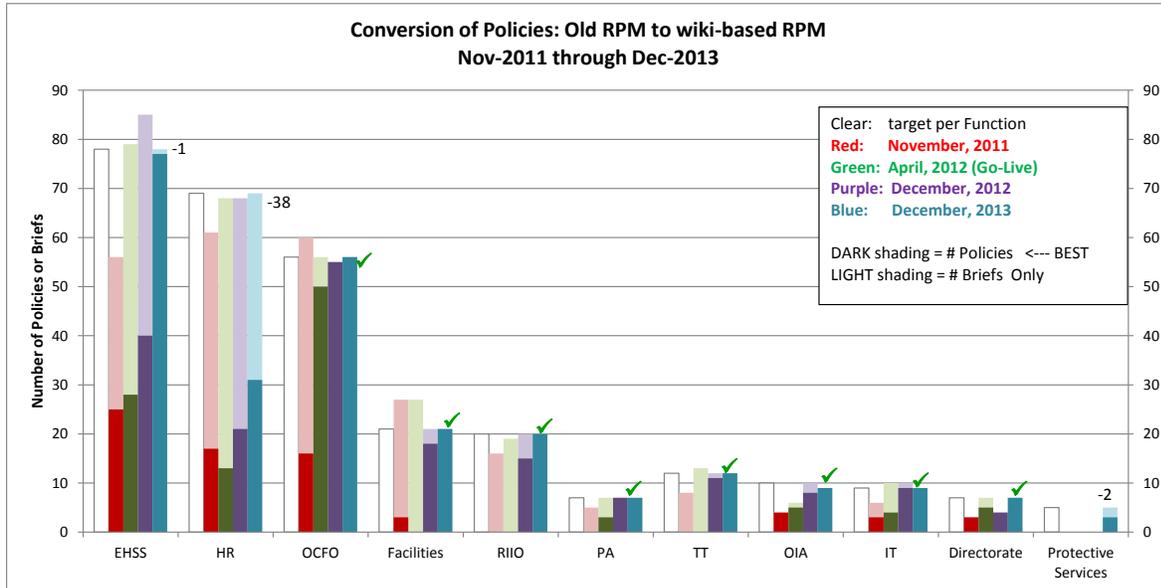


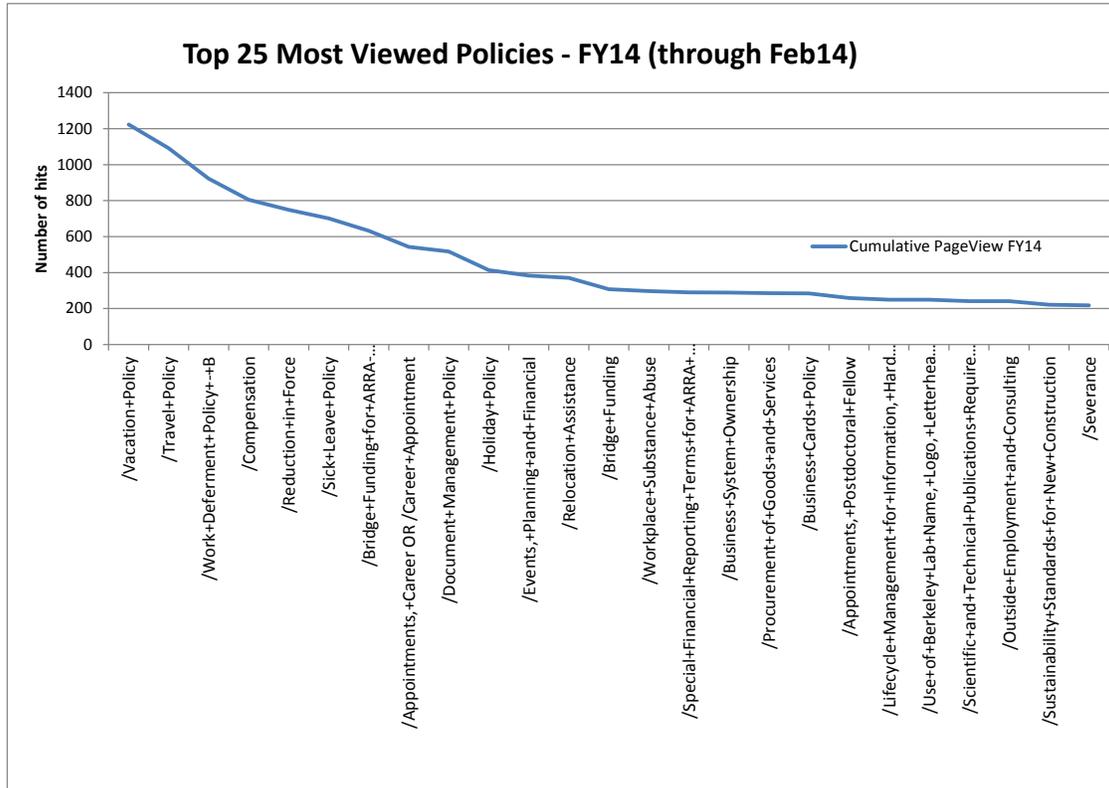
Figure 4-C



4.b.3. RPM Usage – average hits per month for first 5 months of FY14 is approximately 7600.

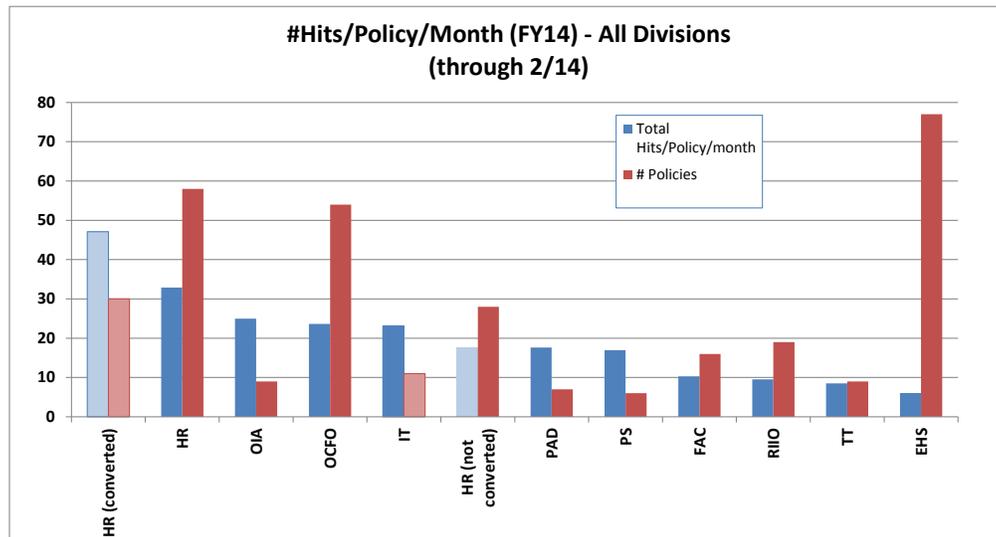
4.b.4. RPM Usage – the most viewed policies: Figure 4-D present the 25 most viewed policies during FY2014. Vacation, Travel, Sick Leave and Holiday are clearly among the most popular. Interestingly, the October 2013 U.S. Government shutdown caused the highest number of hits (894) in a single month for a single policy (“Work Deferment”). The hit rate for this policy has shrunk back to less than 10 per month since.

Figure 4-D



4.b.5. RPM Usage – averaged Division hits: Figure 4-E captures a different measure of interest: number of hits per month averaged over all policies owned by a Division. This chart shows that the HR policies that have been converted indeed are among the most viewed. Some of the groups or divisions with far smaller number of policies have relatively high hit rates per policy. The hit rates of EH&S policies is quite low as should be expected since users should be going directly to PUB-3000 (ESH Manual) first.

Figure 4-E



#### 4.c. Recommendations and Focus FY14-15 (RPM)

We recommend:

- Continuing a process and organizational structure (such as RMC) to maintain the accuracy and currency of the RPM policies, whether driven by changes to Contract or other requirements, by division initiated improvements, or by periodic reviews. CSO should continue to support editing and publication of the RPM.
- Completing the conversion of the remaining HR policies which, though linked to the new RPM, are not easily searchable because they are housed in a different platform (html) space. These unconverted policies do not consistently provide to the reader nor to the RMS database the necessary information to demonstrate the flow-down from requirements to implementing documents.
- Making ease-of-use improvements for readers that take advantage of the wiki-based application capabilities. We should complete the project to enable search by labels for interest groups (for example, policies for new employees, policies for subcontractors, etc.)
- Continue socializing the RPM when opportunities arise (for example, Emergency Management annual fair).

### 5. RMS Database:

5.a. **General:** The main purposes of the RMS database are

- (a) to capture the relationships between requirements, implementing and supporting documents,
- (b) to manage and track changes to requirements and supporting documents, and
- (c) to manage and track completion of Contract 31 deliverables.

Whereas a single policy in the RPM displays its driving requirements and its supporting documents, the RMS database provides (for example) all the policies, documents, and other requirements associated with a given requirement. A user can extract the change history of Contract requirements as well as policies and other uploaded documents.

For data entry, the RMS database uses a workflow approach that follows the basic RM process steps for the management of documents (draft, review, approval, release). Data entry functionality is available to SMEs, but is currently exercised only by RMC members. Search is open to all persons with LDAP access.

A third party supplier, Ovitax, started development on the RMS database in September, 2011, and released it at the end of 2012 so that data entry could begin. L. Young (RM Program Manager) wrote the design requirements, managed the project during development, and performed final acceptance testing. Ovitax provides application technical support and design improvements, while LBNL IT provides system support. Total cost for initial 1 year development efforts was about \$200K. Maintenance and licensing fees have been approximately \$30K per year. An improvement effort in late 2013 cost approximately \$45K.

**5.b. Contract deliverables:** Dispersed throughout DOE Contract 31 are requirements for specific reports or data, often on a periodic schedule but sometimes triggered by a specific event or circumstance. Until 2010, there was no formal tracking of completion of these deliverables. In late 2010, BSO completed development of a Share Point deliverables tracking system and followed by a comprehensive accounting of items delivered against Contract 31 starting June 1, 2005. With the Lab's assistance, BSO determined that the Lab had delivered all but one of 350 or so in total during the period 2005 through 2010. The Lab has continued to meet its commitments for the years since. The RMS database came on line in late 2012 and serves as a simple tracker that is updated once an owner has submitted his/her report directly to BSO. The system issues email reminders of upcoming due dates. The database can be used as a repository for the various reports, but we need to determine rules on the handling of confidential information before encouraging this practice. In addition, there seems to be an increasing use of direct on-line reporting.

**5.c. Some data about the RMS:** To date, usage of the RMS is relatively low, mostly due to limited marketing of its existence and utility. Advertising had been purposefully minimized while it was being populated with information drawn from the policies uploaded in the RPM. As of early March 2014, the RMS has nearly 1000 requirements records and nearly 1000 document records, representing contract deliverables and what are directly associated with contract deliverables and roughly 265 (=88%) Lab policies. Not yet entered are the remaining Contract requirements that do not directly drive Lab policy, and the requirements and supporting documents associated with the still unconverted policies.

**5.d. Recommendations and Focus FY14 to FY15 (RMS Database)**

The database is not fully populated. Several recommendations for the near term (FY14) regarding the data itself include:

- Continue building the data set. Add the Contract requirements that do not directly drive policies. Add information from newly converted policies.
- Continue using the RMS for tracking changes to requirements and uploaded documents.
- Define a quality assurance process, and then perform regular quality checks to maintain data integrity.

The database is not yet widely used for searching.

- A focus for the remainder FY14 should be to increase socialization among those who perform audits and investigations, and those who analyze/write policies. Recent training has been held for BSO staff (approximately 14 attended) and Internal Audit (approximately 6 attended).

The database functionality is good, but improvements will be identified with increasing number of users.

- Obtain more feedback on search capability. If funds permit, improve search capabilities.

Finally, currently the RM Program Manager (L. Young) is the only expert on the RMS application within the Laboratory. For business continuity reasons, we recommend

- Training at least one other person to the super-user level on data entry and maintenance of the data. This needs to be done within FY14.

- Determining the support model for the RMS database. LBNL IT-Business has the responsibility for ensuring support. Currently, all application support is provided by Ovitax engineers while system support is coordinated by LBNL IT-Business. No one in LBNL IT-Business has domain knowledge of the application.

## **6. SUMMARY**

The RM Program has made great progress since its inception in late 2010, not only developing a management system, but also undertaking the large effort of re-structuring the Laboratory's policy manual.

In terms of its effectiveness and efficiency and overall value, the RPM Program's centralized coordination and system of institutional processes have improved the Lab's overall quality in managing institutional requirements:

- All Contract requirement owners are held to the same expectations for addressing changes to requirements.
  - Responses require impact and risk analyses, with consideration to how and what Lab policies or programs may be affected.
  - Any impacts are expected to be addressed via an implementation plan, which is part of a response package
  - If changes are made to institutional policies or programs, owners are expected to include a plan to communicate the changes to the impacted personnel.
  - Responses are documented
  - Responses are tracked, and timeliness for completion is urged.
- Completion of the Laboratory's Contract deliverables is tracked.
- The RMC members are the points of contact on requirements-related and policy-related matters.
  - They are facilitators for communications between Lab functions/divisions on such matters.
  - They are facilitators for communications between the Lab and BSO, the Lab and UCOP.
- The RM processes are straightforwardly applicable to all business disciplines.
  - Adoption of a common set of rules across all of Lab Operations can facilitate cross-functional collaboration and cooperation.
- Overall, the formalization of processes to manage requirements gives the Laboratory the means to measure its performance and to present evidence of compliance in requirements-related matters.

In terms of its level of maturity toward sustainability, the RM Program's processes are in practice by much of the Laboratory's Operations divisions, though nearly all groups still require coaching to varying degrees by either their respective RMC representatives and/or RM Program Manager. Thus, to build a stronger base where a critical mass of divisions practices the RM process principles regularly and with little direct help from the Program, we recommend continuing the current Program course for at least

another three years. A summary of recommendations put forth for sustainability in the several sections of this document includes:

- Continuing the RMC with minor changes to its Charter.
- Continue coaching Divisions, Departments to adopt and apply RM and document management processes and best practices for integrated/collaborative efforts and for document readability, accessibility, and currency.
  - Via RMC and several high level cross-functional corrective action plan (CAP) initiatives to raise adoption level in Facilities, Protective Services, and HR.
  - Via select projects to raise adoption level in Engineering.
- Continuing a process and organizational structure (such as RMC) to maintain the accuracy and currency of the RPM policies, whether driven by changes to Contract or other requirements, by division initiated improvements, or by periodic reviews. CSO should continue to support editing and publication of the RPM.

**RM Program Plan for FY2014-2015:**

- Specific tasks:
  - Extend RMC Charter by end May, 2014
  - Work with HR to determine plan to reduce pile of unconverted policies to less than 10 by end FY15.
  - Complete populating RMS database with remaining Contract 31 requirements by end FY14.
  - Make minor improvements to RMS database search and report capabilities, if/when funding permits (approximately \$10K).
- On-going:
  - Continue role as Lab facilitator on pre-Contract 31 proposed modifications
  - Continue managing in-Contract 31 modifications to ensure timely flow-down into Lab programs, policies, and processes.
  - Continue maintaining policies in the Lab's RPM. This requires the assistance of CSO at approximately \$30K per year.
  - Continue managing the Lab's Contract deliverables via the RMS database. This requires an annual maintenance/license fee of approximately \$30K per year.