

Business Case Analysis

Cost/Benefit Study for Replacing SBMS  
with Commercial Software

at

Brookhaven National Laboratory

*A Four-Year Projection*

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# Table of Contents

Executive Summary.....	<b>(ii)</b>
Introduction and Overview.....	1
Assumptions.....	1
Business Impacts.....	4
Risks and Sensitivities.....	6
Summary and Conclusions.....	10
Exhibits.....	11



## Executive Summary

The Standards-Based Management System (SBMS) is a Laboratory system for managing requirements and integrating those requirements with business processes at Brookhaven National Laboratory (BNL). BNL is managed by Brookhaven Science Associates (BSA), a partnership of Battelle and the State University of New York at Stony Brook (SBU). Critical Outcomes, which represent expectations the Department of Energy has for BSA's performance, are part of the prime contract with the Department of Energy, and these Critical Outcomes are supported by the lab wide use of SBMS. It is critically important to emphasize that this business case does not, in any way whatsoever, alter the position of SBMS as a core business system and a signature feature within BNL as a Battelle Laboratory.

Pacific Northwest National Laboratory (PNNL), which is managed directly by Battelle Corporation, maintains the software and hardware we use to facilitate this effort. Concerns have been raised surrounding the ownership/operation costs, risks associated with a small user base, and technological improvements offered in a new generation of commercial "off-the-shelf" software (COTS). This business case addresses a proposal to migrate the current document set and databases to a COTS system and includes the following areas:

- *Risk Management.* The risks associated with maintaining the current application can be reduced with a move to a COTS system. The business case analysis shows a marked reduction in risk achieved through COTS.
- *Cut costs and reduce reliance on highly technical staff.* Put content management firmly in the hands of editorial staff. Currently, due to the design of the system, many content elements can be changed only by PNNL IT staff. Cost reductions on the order \$200K/year are achievable, which would be nearly 50% reduction in the software-related costs and about 25% reduction in the overall costs of SBMS at BNL.
- *Provide the Opportunity to broaden BNL electronic knowledge management.* This is a potential cross-functional applicability of a COTS solution. This type of COTS solution typically is more comprehensive than just the needs of SBMS, particularly in its ability to manage web content management and incorporate workflow within electronic document management. These have applicability within several Laboratory functional areas that have a business requirement for web content management. We anticipate that an SBMS COTS approach can be extended to provide a solution for these other areas.
- *Improve efficiency of Editorial process.* Improving system response time for Editorial staff by physically locating hardware on-site at BNL will allow significant improvements to the workflow with in-context editing tools and address design issues that impact BNL SBMS office operations. This is quite important in a heavily over-loaded and resource-constrained SBMS Office at BNL.

- *Position BNL better with respect to data standards.* XML has emerged as the universal format for structured documents and data on the Web. SBMS content is not in XML format now, and it should be. Cost analysis shows it would be more cost effective to migrate BNL's SBMS content to a system that is designed around this standard, rather than to train PNNL software engineers in XML and convert our current system to this standard.
- *Leverage industry knowledge.* The SBMS is a web-based document- and content-management system. An entire industry has evolved in this area, where ten years ago it was virtually non-existent. Many features that the current SBMS lacks are considered to be industry standard (e.g. workflow; file/link management tools, etc.). Additionally, a COTS approach allows BNL to leverage the research and development of new features driven by the commercial market.
- *Vendor ownership of significant issues.* The ownership of the current SBMS is split between PNNL and BNL. All enhancements and issues are addressed as costs to both PNNL and BNL. This would not be the case for a COTS product since the vendor's maintenance agreement would cover the cost of software fixes and upgrades. This spreads the cost across the vendor's entire user base (p. 24).

This business case has been supplemented by the utilization of a consulting firm (DocuLabs) to assist in the development of SBMS requirements, fit those requirements against COTS solutions and provide an assessment of the state of the industry.

The conclusion of this business case is that SBMS should be moved to commercial software as expeditiously as possible. The primary drivers are, in order of priority: (a) leveraging of the large user base and user-driven improvements inherent in commercial software; (b) improvements in the efficiencies of the software itself in a highly resource-limited BNL SBMS office; (c) direct cost savings; and (d) the gateway that a COTS SBMS would provide for broader electronic document and knowledge management at BNL. Additionally, a decision to move SBMS to a COTS application is indicative of a very clear BNL commitment to SBMS as a management system, through proactively addressing the limits and risks associated with the current application. Finally, we want to point out that there is no issue with the support that has been and is being provided by PNNL. Brookhaven's ability to ramp up SBMS quickly and run it effectively has been done only because of the superb support received from PNNL.

## I. Introduction and Overview

**Subject:** This case examines the likely costs, benefits, and risks of replacing the current Standards-Based Management System (SBMS) with a commercial “off-the-shelf” (COTS) product, and moving the documents and databases of the current SBMS into the replacement system, as proposed by Brian Sack in March 2002. There are three scenarios that are explored here:

- Scenario 1: SBMS stays as is
- Scenario 2: COTS implemented at BNL
- Scenario 3: Current SBMS moves to BNL

Changing course with SBMS will require several major actions, including new database development, content modeling, data architecture, and data transfer, application development, parallel operation, and training. This analysis covers the expected cost and benefit consequences of these actions, as they are expected to impact Brookhaven National Laboratory during Fiscal Years 2003 through 2007.

The current SBMS uses a database server and a web server for each of three environments: the production site, an authoring site (collaboration and editorial processing), and a quality assurance site for testing documents before publication. There are also servers for development and for general file sharing.

## II. Assumptions

Predictions, simplifications, clarifications, and scope are as follows.

### A. Predictions

Prediction: Legacy document (LD) conversion rate will accelerate and SBMS Editorial staff will increase to meet subject area (SA) development targets; editorial emphasis (75% of resource allocation) will shift to new subject area creation during FY03-FY04.

Prediction: All COTS solutions will require standard licensing/maintenance fees (18% of purchase).

Prediction: Licensing fees for Oracle will jump significantly in FY04.

Prediction: Major system architecture changes will need to be made to the current SBMS in order to take advantage of technological improvements (e.g., XML). These changes will be delayed to FY05 if BNL stays with the current SBMS.

Prediction: COTS solutions that meet SBMS requirements will reduce the reliance on technical staff once data modeling and content transfer are completed; content control will sit squarely in the hands of Editorial. This prediction is supported by a formal technology solution review provided by Doculabs (see Exhibit F).

Prediction: A COTS solution to handle web content management, document management, and workflow will be able to meet similar business requirements in Human

Resources, Fiscal Division, Library, Records Management and possibly other functional BNL areas.

## **B. Simplifications**

Simplification: Information Technology Division will provide infrastructure support, including network infrastructure and system backup hardware/software. There are no incremental costs for these services.

Simplification: In Scenario 2, business tool development (screens, templates, forms, etc.) will be handled by SBMS staff, an application programmer at BSD, and/or a software support team provided by the vendor.

## **C. Clarifications**

Clarification: PNNL currently provides information technology (IT) resources to the SBMS Office for system administration and application support. At BNL, these two functions are split between two Divisions (the Information Technology Division and the Business Systems Division). If a COTS solution is implemented, then these IT resources will be mutually provided by ITD and BSD (details are provided in Exhibit A).

Clarification: It will not be feasible to use current hardware at BNL, because it is expected that useful life for current hardware will be over when BNL begins implementing new solution. FY03 money has been allocated for new hardware.

Clarification: A significant (\$100K) reduction in SBMS budget in FY03 prevents identified system fixes from being implemented in FY03. These issues are documented in a problem log in the SBMS Office. The cost for those fixes will be pushed into FY04 if Scenario 1 or Scenario 3 is implemented.

## **D. Scope and Boundaries: Time Frame and Organizations**

- Analysis begins Oct 2002 and ends Oct 2007.
- Analysis is synchronized with fiscal years.
- Analysis includes references to Pacific Northwest National Laboratory (PNNL) and Brookhaven National Laboratory (BNL), but the cost analysis is focused on benefits to BNL only

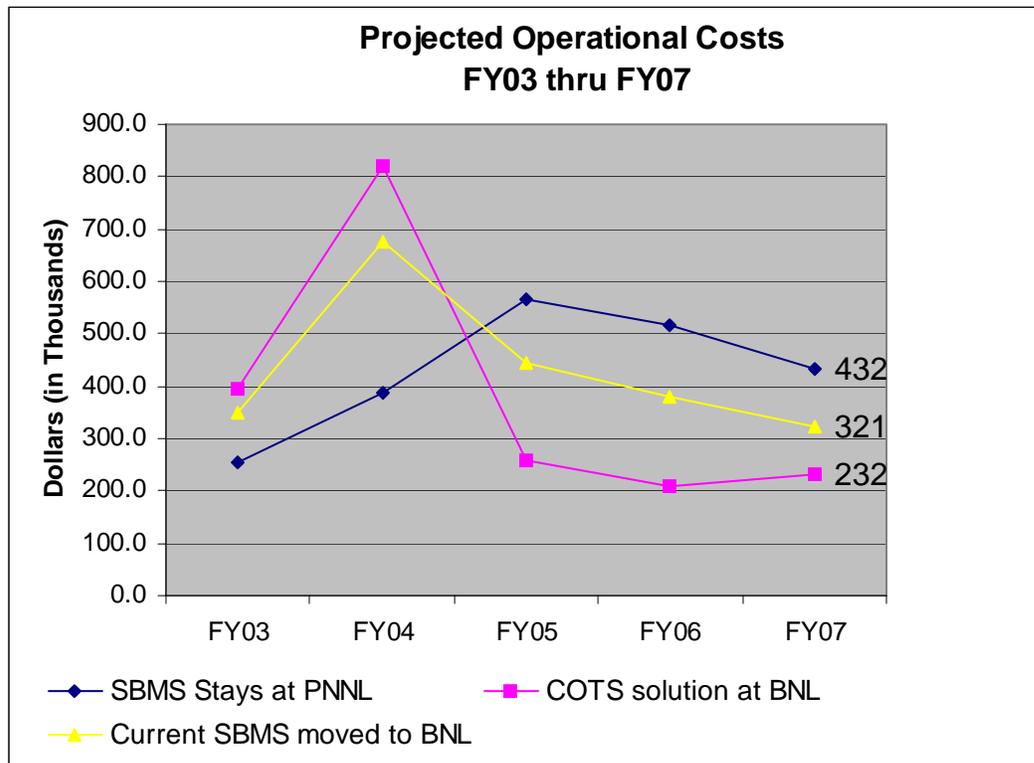
### III. Business Impacts

Yearly Operational Costs. The following table and graphic illustrate the yearly operational costs associated with each of the three scenarios. See Exhibit C for details on how these numbers drill down to a task/resource level.

**Table 1. Yearly Operational Costs, FY03 thru FY07 (in thousands of \$).**

	FY03	FY04	FY05	FY06	FY07
SBMS Stays at PNNL	254.0	388.0	564.0	516.0	432
COTS solution at BNL	396.0	821.7	259.0	210.0	232
Current SBMS moved to BNL	351.0	675.0	446.0	381.0	321

**Figure 1.**

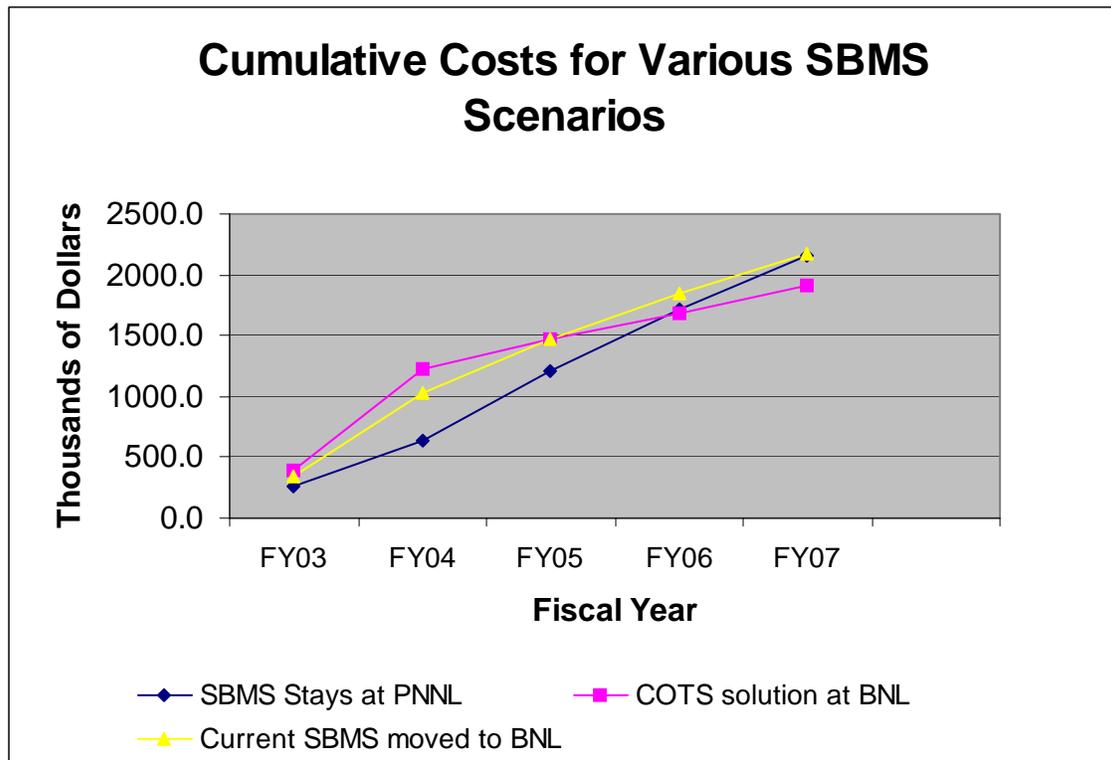


Cumulative Operational Costs. The following table and graphic illustrate the cumulative costs associated with each of the three scenarios. See Exhibit C for details on how these numbers drill down to a task/resource level.

**Table 2. Cumulative Operational Costs, FY03 thru FY07 (in thousands of \$).**

	FY03	FY04	FY05	FY06	FY07
SBMS Stays at PNNL	254.0	642.0	1206.0	1722.0	2154.0
COTS solution at BNL	396.0	1217.7	1476.7	1686.7	1918.7
Current SBMS moved to BNL	351.0	1026.0	1472.0	1853.0	2174.0

**Figure 2.**



## IV. Risks and Sensitivities

In this section we identify and analyze risks. We then identify where the conclusions of the business case are sensitive; i.e., what conditions would change the outcome of the analysis significantly.

**A. Risk Identification.**

Table 3. Risks.

Risk Factor	Description of Potential Event(s)
(a) <i>Critical staff</i>	Unexpected staff turnover or staff unavailable when critical problem evident
(b) <i>Support loss</i>	Vendor no longer supports system
(c) <i>Battelle impact</i>	Battelle is negatively impacted
(d) <i>Requirements definition</i>	Poor requirements definition impacts system development efforts
(e) <i>State-of-art technology</i>	BNL is poorly positioned to take advantage of changing technologies and newly emerging standards
(f) <i>Knowledge management strategies</i>	BNL is unable to scale system functionally to meet broader implementation goals; content cannot efficiently be used in sitewide knowledge management strategies
(g) <i>Productivity</i>	Productivity improvements impeded by system design or system limitations
(h) <i>Cost savings</i>	Operational costs exceed management expectations

**B. Risk Analysis**

The steps taken for risk analysis are as follows.

1. Identify *risk assessment parameters*. These include probability of event occurring, and the impact if event does occur. (See Table 4.) Assign numerical values to these parameters.
2. For all three scenarios, *assign a probability and an impact*. (See Table 5.)
3. *Calculate* a risk index for each scenario.

**Table 4. Risk Assessment Parameters.**

Probability of Occurrence	
Certain	70 – 100%
Probable	40 – 69%
Possible	5 – 39%
Improbable	Near 0%
Impact if Occurs	
Catastrophic (Cat)	Failure of the project or mission
High (High)	Failure to meet major requirement, unacceptable increase in cost or time to complete
Moderate (Mod)	Extensive adjustments to meet established goals
Low (Low)	Minor adjustments to meet established goals

**Table 5. Probability of occurrence, impact, and risk indices by scenario.**

<i>Risk Area</i>	<i>Scenario</i>	<b>Scenario 1 SBMS “As Is” Probab/Impact</b>	<b>Scenario 2 COTS SBMS Probab/Impact</b>	<b>Scenario 3 SBMS Moves to BNL Probab/Impact</b>
(a) Critical staff		Certain/Cat	Possible/Cat	Possible/Cat
(b) Support loss		Possible/Cat	Improbable/Cat	Improbable/Cat
(c) Battelle impact		Improbable/High	Improbable/High	Possible/High
(d) Requirements definition		Possible/Low	Possible/High	Possible/Cat
(e) State-of-art technology		Certain/High	Improbable/High	Certain/High
(f) Knowledge-management strategies		Certain/High	Improbable/High	Probable/High
(g) Productivity		Probable/High	Possible/High	Probable/High
(h) Cost savings		Probable/High	Possible/High	Possible/High
<b>Index*</b>		<u>7.1</u>	<u>4.1</u>	<u>5.4</u>

\*Higher index = greater risk; Calculation details are found in Exhibit D.

**C. Sensitivities.**

Here we describe changing conditions that could change the outcome of the business case significantly.

1. Sensitivity 1: Level of support. The cost of using PNNL IT resources is in large part determined by our Service Level Agreement (SLA) (Exhibit E), which details the issues PNNL is expected to respond to and how quickly it must respond. There is no competition for PNNL IT resources; SBMS gets the resources it needs as agreed in the SLA because BNL pays PNNL for this level of support. There has been less than 0.1% downtime for the SBMS since it was implemented. In Scenarios 2 and 3, the SBMS Office will be competing for resources with other mission-critical systems: Human Resources, Payroll, Training, etc. If the service level were to change in implementing Scenarios 2 and 3, then the business case cost analysis would be flawed.
2. Sensitivity 2: Incremental staffing. The BNL ITD and BSD organizations will be providing resources to implement Scenarios 2 and 3. The managers of those divisions have provided incremental staffing costs, and these costs have been included in the business case. If the incremental staffing needs were to change, then the business case cost analysis would be flawed.

3. Sensitivity 3: Hardware requirements. Scenario 1 requires six servers to implement; PNNL has advised against BNL's request to pare down the number of servers, citing risks in the event of system failure. Scenarios 2 and 3 require four or fewer servers; this projection is based on (1) the preliminary assessment of two COTS vendors who have reviewed our requirements and (2) the hardware that is already available at BNL to mitigate the risk of system failure. If the projection on the number of servers were to change, then the business case cost analysis would be flawed.
4. Sensitivity 4: COTS costs. The cost analysis for Scenario 2 is based in part on one vendor's preliminary proposal. This COTS solution cost estimate is probably on the average-to-low end. There are likely two or more vendors who will respond to our RFP with much higher estimates. If the COTS costs turned out to be significantly higher, then the business case cost analysis would be flawed.

## Summary and Conclusions.

Migrating the current document set and databases to a COTS system would have the following impacts and issues (as noted earlier in the Executive Summary).

- *Reduce overall risk.* The risks associated with maintaining the current application can be reduced with a move to a COTS system.
- *Cut costs and reduce reliance on highly technical staff.* Put content management firmly in the hands of editorial staff. Currently, due to the design of the system, many content elements must be changed by IT staff at PNNL.
- *Opportunity to broaden BNL knowledge management;* cross-functional applicability of COTS solution. A general COTS solution to handle web content management and workflow can handle more than just the needs of SBMS. There are several key functional areas within the lab that have a business requirement for web content management. This solution for SBMS can be extended to also provide a solution for these other areas.
- *Improve efficiency of Editorial process.* Improve system response time for Editorial staff by physically locating hardware on-site at BNL; will allow improvements to the workflow with tools like in-context editing; address design issues that impact operations.
- *Position us better with respect to data standards.* XML has emerged as the universal format for structured documents and data on the Web. Our content is not in XML format now, and it should be. Cost analysis shows it would be preferable (more cost effective) to migrate our content to a system that is designed around this standard, rather than to train PNNL software engineers in the standard and convert our current system to this standard.
- *Leverage of industry knowledge.* The SBMS is a web-based document- and content-management system. An entire industry now exists in this area, where ten years ago there was almost nothing. Many features that the current SBMS lacks are considered standard (workflow; file/link management tools), and much research and development goes into the development of new features in the

commercial market.

- *Vendor ownership of significant issues.* The ownership of the current SBMS is split between PNNL and BNL. All enhancements and issues are addressed at costs to both PNNL and BNL. This would not be the case for a COTS product since the vendor's maintenance agreement would cover the cost of software fixes and upgrades. This spreads the cost across the vendor's entire user base (p. 24).

Last, but not least, the SBMS as a Battelle laboratory signature feature *is the management system itself*, not the software application. A decision to go with a COTS product would be indicative of our clear commitment to the SBMS as a management system, in proactively addressing the limits and risks associated with the current application.

Recommendation: Replace the current SBMS system with a COTS product that first and foremost meets the requirements of the SBMS, giving stronger consideration to products that will functionally scale up or integrate well with other systems to meet the broader needs of BNL.

**Exhibits:**

- Exhibit A –SBMS IT Support Task – FY03
- Exhibit B – Hardware Replacement Schedule, Scenario 1
- Exhibit C – Cost Analysis Details
- Exhibit D – Risk Details
- Exhibit E – Service Level Agreement with PNNL
- Exhibit F – Presentation, Doculabs (12/02)

## Exhibit A: SBMS IT Support Tasks – FY03

**The following table represents IT tasks only. Other operational tasks (system support, configuration management, and content management) currently done at PNNL will need to be absorbed by the SBMS Office.**

Task currently being performed by PNNL	Scenario 2: Organization and Responsible Party Ops years ONLY	Scenario 3 Organization and Responsible Party Ops years ONLY
<b>Task 1. System Administration.</b>		
<b>NT System Administration:</b> <ul style="list-style-type: none"> <li>Provide NT system administration support for 10 BNL servers (BWPROD, BDPROD, BWAUTH, BDAUTH, BWDEV, BDDEV, SWTEST, SBMSFS, Synergy, BWAUTH2)</li> </ul>	ITD- Quarant. Server count would drop to 4.	ITD- Quarant. Server Count would drop to 4.
<ul style="list-style-type: none"> <li>Hardware setup: setup and configure new servers, replacement components, peripheral equipment</li> </ul>	ITD- Quarant.	ITD- Quarant.
<ul style="list-style-type: none"> <li>OS installation and configuration: install new versions and upgrades of server operating system, install service patches</li> </ul>	ITD- Quarant?	ITD- Quarant?
<ul style="list-style-type: none"> <li>Account administration: grant access privileges to servers, applications, and SBMS products</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Performance monitoring: review event log daily for performance degrading conditions</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Security monitoring: perform daily security checks of all SBMS servers</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>System backup and restore: backups are done daily, restores are completed, as required</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>System Virus Scanning: complete weekly virus scans of all servers, update Norton Virus tool periodically</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>Capacity planning: evaluate hard drive available space monthly</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>User education and training: support Help Desk* problem resolution, Weblogs education, etc. as required</li> </ul>	BSD- Dooling - This means that BSD will help SBMS staff understand how the product works when functionality is in question	BSD- Dooling This means that BSD will help SBMS staff understand how the product works when functionality is in question
<ul style="list-style-type: none"> <li>System troubleshooting and repair: complete diagnostic evaluations to reported problems and implement fixes, as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Technical assessments and research: respond to Help Desk* requests with WebTrends and</li> </ul>	BSD- Dooling	BSD- Dooling

<b>Task currently being performed by PNNL</b>	<b>Scenario 2: Organization and Responsible Party Ops years ONLY</b>	<b>Scenario 3 Organization and Responsible Party Ops years ONLY</b>
Microsoft IIS tools		
<ul style="list-style-type: none"> <li>Security plan development and maintenance: create SBMS Security Plans and update as required; complete and maintain Risk Assessment/Sensitivity Determination (RASD) forms.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Project level mentoring and cross training.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Operations Guide development and maintenance: create SBMS Operations Guides and update as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Ad-hoc client / developer Windows NT support: provide system administration support, as required for client and project development team</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Hardware and software inventory: complete annual inventory of hardware and software</li> </ul>	BSD- Dooling	BSD- Dooling
<p><b>Database Administration</b></p> <ul style="list-style-type: none"> <li>Provide database administration for 6 SBMS Oracle databases (bsd1.dev.irm bsd2.dev.irm, bsa1.world, bsp1.world, bsq1.world, bsq2.world)</li> </ul>	ITD- Quarant - Database configuration may change with new product; 6 may not be necessary	ITD- Quarant - Database configuration may change with new product; 6 may not be necessary
<ul style="list-style-type: none"> <li>Installation and configuration: complete installation and upgrades of databases, apply patches, as required</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>Storage management: perform space maintenance on tables each month, sizing data files, repairing chained rows in data files, database tuning for optimal performance</li> </ul>	ITD- Quarant	ITD- Quarant
<p>Security management: grant access privileges to SBMS databases, editors, and applications as required, monitor for security problems</p>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>Application support: evaluate architecture of system and how it is populated, maintain internal application job/package refreshes (db_links, db_move, etc.), as required</li> </ul>	BSD- Dooling - The specifics of the application support will be determined when the product is selected	BSD- Dooling - The specifics of the application support will be determined when the product is selected
<ul style="list-style-type: none"> <li>General database maintenance: perform snapshot refresh maintenance daily, maintain daily execution and backups of database for recovery</li> </ul>	BSD- Dooling	BSD- Dooling

<b>Task currently being performed by PNNL</b>	<b>Scenario 2: Organization and Responsible Party Ops years ONLY</b>	<b>Scenario 3 Organization and Responsible Party Ops years ONLY</b>
<ul style="list-style-type: none"> <li>Client system and ODBC data source configuration: assist clients with their system setup and configuration, as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Ad-hoc reporting: support requests for database reports, general Oracle usage reports, number of sessions, etc. as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>System troubleshooting and repair: complete diagnostic evaluations to reported problems and implement fixes, as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Documentation: provide support with development of Operations Guides, Security Plans, etc.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Installation and configuration: install and configure new applications and upgrades to existing applications required to operate SBMS</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Security management: manage security issues, including application access privileges; determine rules by which security practices will be administered across SBMS applications</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>System maintenance and repair: complete investigation of reported application and web-related problems and implement fixes, as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>System monitoring: stay abreast of SBMS performance and functionality capabilities, recommend enhancements that will enhance future operability of system</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>User education and training: support Help Desk* problem resolution, Weblogs education, etc. as required</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Documentation: provide support with development of application documentation</li> </ul>	BSD- Dooling	BSD- Dooling
<p><b>Application / Web Server Administration</b></p> <ul style="list-style-type: none"> <li>Installation and configuration: install and configure new applications and upgrades to existing applications required to operate SBMS</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>Security management: manage security issues, including application access privileges; determine rules by which security practices will be administered across SBMS applications</li> </ul>	ITD- Quarant	ITD- Quarant

<b>Task currently being performed by PNNL</b>	<b>Scenario 2: Organization and Responsible Party Ops years ONLY</b>	<b>Scenario 3 Organization and Responsible Party Ops years ONLY</b>
<b>P rocurements</b> <ul style="list-style-type: none"> <li>System software license renewals</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Replacement hardware components</li> </ul>	ITD- Quarant	ITD- Quarant
<ul style="list-style-type: none"> <li>Miscellaneous IT project team expenses (e.g. cell phone charges)</li> </ul>	BSD- Dooling	BSD- Dooling
<b>Task 2: Operations and Maintenance</b> <ul style="list-style-type: none"> <li>Problem identification, tracking and resolution Testing/Documentation (Operations procedures, Security plans)</li> </ul>		
<b>Project Management and Oversight</b> <ul style="list-style-type: none"> <li>Single Point of Contact between BNL and PNNL IT project team. All tasks coordinated through the IT Project Manager.</li> </ul>	SBMS Staff - The need for this function in the scenarios 2 and 3 is not clear.	SBMS Staff - The need for this function in the scenarios 2 and 3 is not clear.
<ul style="list-style-type: none"> <li>Monitor IT project activities to ensure all tasks are completed within budget, on schedule, within scope and in compliance with established BNL organizational and SBMS-specific procedures.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Manage all phases of software development and enhancements from requirement definition to final acceptance by the BNL Client****.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Oversee all software testing by IT project team and SBMS clients***.</li> </ul>	SBMS Office - Maugeri	SBMS Office - Maugeri
<ul style="list-style-type: none"> <li>Oversee technical "big picture" activities (e.g., coding standards, common development tools)</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Procure all hardware and software necessary for continuance of SBMS operations.</li> </ul>	BSD- Dooling	BSD- Dooling
<ul style="list-style-type: none"> <li>Provide operations reports for BNL that summarize budgets, system downtimes, and status of problems being worked during the reporting period.</li> </ul>	SBMS Office - Maugeri will compile downtime and track problems	SBMS Office - Maugeri will compile downtime and track problems
<ul style="list-style-type: none"> <li>Coordinate weekly operations status meeting with BNL and PNNL staff.</li> </ul>	SBMS Office - Maugeri will coordinate regular meetings with BSD application Programmer	SBMS Office - Maugeri will coordinate regular meetings with BSD application Programmer
Total FTE and Cost: Included within System Administration and Operations and Maintenance Tasks  PNNL – 2 FTEs	Total Incremental Labor FTE: BSD – 1 ITD – 0 SBMS – 1	Total Incremental Labor FTE: BSD – 1 ITD – 0 SBMS – 1

\*PNNL "Help Desk" requests are created when the BNL SBMS Office - Maugeri reports a problem or requests an enhancement.

\*\*\*"BNL Client" or "SBMS Clients" refers to the SBMS Office – Maugeri

**Exhibit B: Hardware Replacement Schedule, Scenario 1 (SBMS stays at PNNL).**

<b>Item</b>	<b>Units</b>	<b>Unit Cost</b>	<b>Total</b>	<b>Priority</b>
DLT Tapes	20	\$55	\$1,100	1
DLT Cleaning Tapes	2	\$40	\$80	2
Tape Library	1	\$4,000	\$4,000	3
Window 2000 Upgrd Servers*	7	\$450	\$3,150	4
Monitor	6	\$15,000	\$90,000	5
Monitor	1	\$1,400	\$1,400	6
<b>Total Cost</b>			<b>\$99,730</b>	
<b>Phased-in Costs</b>				
<b>FY 2002</b>				
DLT Tapes	20	\$55	\$1,100	1
DLT Cleaning Tapes	2	\$40	\$80	2
Tape Library	1	\$4,000	\$4,000	3
Window 2000 Upgrd	7	\$450	\$3,150	4
<b>Total FY 2002</b>			<b>\$8,330</b>	
<b>FY 2003</b>				
Servers	2	\$15,000	\$30,000	5
Monitor	1	\$1,400	\$1,400	6
<b>Total FY 2003</b>			<b>\$31,400</b>	
<b>FY 2004</b>				
<b>Total FY 2004</b>	2	\$15,000	\$30,000	5
			<b>\$30,000</b>	
<b>FY 2005</b>				
<b>Total FY 2005</b>	2	\$15,000	\$30,000	5
			<b>\$30,000</b>	

\* Server costs range is 12 - 15 K. Hardware should be less expensive over time.

**Exhibit C: Cost Analysis Details.**

Line Item Num.	IT RESOURCE	FY03			FY04- Transition to COTS			FY05			FY06			FY07			
		PNNL: Scenario 1 (a)	BNL COTS for FY04: Scenario 2 (b)	SBMS moves to BNL in FY04: Scenario 3 (c)	Scen 1	Scen 2	Scen 3	Scen 1	Scen 2	Scen 3	Scen 1	Scen 2	Scen 3	Scen 1	Scen 2	Scen 3	
		Operation Costs	Acquisition and Implementation Costs	Operation + Appl. Dev. Costs	Operation + Appl. Dev. Costs	Operation Costs											
1	Hardware Costs	Server system purchase or upgrade (4 for COTS solution, 6 for PNNL)	30	30	30	30	60	130	30	0	10	30	0	10	30	0	10
2																	
3		Storage space purchase	0	0	0	0	0	20	0	0	0	0	0	0	0	0	0
4		Peripheral HW	8	8	8	0	0	0	0	0	0	0	0	0	0	0	0
5	Software Costs	Operating Systems	3	3	3	0	3	3	0	3	3		3	3	0	3	3
6		Web Server: WebLogic licensing (BNL location)	0	0	0	0	6	6	0	6	6	0	6	6	0	6	6
7		Secure Site Certificates	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8		Application purchase, one-time charge	0	0	0	0	150	0	0	0	0	0	0	0	0	0	0
		Application Licensing	0	0	0	0	30	0		30	0	0	30	0	30	0	0
9		Database Licensing	6	86	6	6	16	16	20	16	16	20	16	16	20	16	16
10		Search Engine	0	0	0	5	5	5	5	5	5	5	5	5	5	5	5
11		Conversion software for moving content to XML, loading databases	0	0	0	0	8	0	50	0	50	0	0	0	0	0	0
12																	
13	Personnel Costs: IT Staff	Preplanning costs	0	50	20	0	60	10	0	0	0	0	0	0	0	0	0
14		HW Installation Labor	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15		Server Prep, shipping, handling	0	0	0	0	0	5									
16		Professional Services:															
17		Install at Server	0	0	0	0	3.2	5	0	0	0	0	0	0	0	0	0
18		Architecture Defined	0	0	0	0	9	0	15	0	15	0	0	0	0	0	0
19		Content Transfer	0	0	0	0	83	5	0	0	0	0	0	0	0	0	0
20		Training costs (professionals)	0	0	0	0	10	4	0	0	0	0	0	0	0	0	0
21		Travel	0	5	0	0	2.5	15	0	0	0	0	0	0	0	0	0
22		Deployment	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0
23		Documentation	0	0	0	0	3	5	0	0	0	0	0	0	0	0	0
24		Project Management	0	10	0	30	15	25	30	0	0	30	0	0	30	0	0
25		IT support for SysAdmin and HelpDesk	110	110	110	110	210	210	120	110	110	130	110	110	130	110	110
26																	
27		<b>Professional Services Total:</b>	<b>110</b>	<b>125</b>	<b>110</b>	<b>140</b>	<b>338.7</b>	<b>274</b>	<b>165</b>	<b>110</b>	<b>125</b>	<b>160</b>	<b>110</b>	<b>110</b>	<b>160</b>	<b>110</b>	<b>110</b>
28		Systems Support	56	56	56	58	42	50	60	43	0	62	44	0	64	46	0
29		Task management and Testing	35	35	35	43	42	50	65	15	65	65	10	65	44	10	65
30		Application Customizing	0	0	0	100	50	100	160	25	160	160	0	160	100	0	100
31	NW & Comms	Network and Communication Costs	3	0	0	3	0	0	3	0	0	3	0	0	3	0	0
32	Other Costs	Procedural changes, testing: Cost impact on staff productivity	2	2	2	2	10	5	5	5	5	5	5	5	5	5	5
33																	
34																	
		<b>Total Cost to BNL</b>	<b>254</b>	<b>396</b>	<b>351</b>	<b>388</b>	<b>821.7</b>	<b>675</b>	<b>564</b>	<b>259</b>	<b>446</b>	<b>516</b>	<b>210</b>	<b>381</b>	<b>432</b>	<b>232</b>	<b>321</b>

Item Details:

Item 1: Server system purchase or upgrade (4 for COTS solution, 6 for PNNL)

In Scenario 1, upgrades to six servers will take place 2 per year, at a cost of 30K each year.

Item 3: Storage Space Purchase. Represents necessary purchases for storing hardware.

Item 4: Peripheral Hardware. Represents Tapes, Cleaning Tapes, Tape Library.

Item 5: Operating Systems. Represents upgrade to Windows 2000 for 7 servers/workstations and necessary IIS software (web server software) for Scenario 1.

Item 6: Webserver. The cost of IIS for Scenario 1 is rolled up into Operating System Costs (line 5).

Item 7: Secure Site Certificates. Self explanatory.

Item 8: Application Software, one-time charge. Represents content management/document management engine

Item 9: Database licensing. For Oracle

Item 10: Search Engine. PNL SBMS upgraded their search engine to an Inktomi one during FY02. Scenarios 1 and 3 values are represented by the cost for the Inktomi license; Scenario 2 assumes that the licensing would be part of the application licensing costs.

Item 11: Conversion software for moving content into XML, and loading databases.

Item 13 - Preplanning costs. Represents (1) resources needed from PNNL to plan transition from current SBMS system to new COTS and (2) contracting support from Doculabs. Does not include SBMS Office, ITD, or BSD staff resource contribution, since these are not incremental costs.

Item 16 -Professional Services. Represents resources needed from COTS vendor to support implementation.

Items 17-23. Details of Professional Services tasks.

Item 24 - Project Management. Scenario 1: SBMS' austerity budget for FY03 means no system enhancements or fixes, so project management resource

needs are essentially zero dollars. In FY04 and outyears, it is assumed that fixes and enhancements will resume.

Scenario 2 and 3: For FY04, some Project Management resources will be purchased from COTS vendor. For FY05 and outyears, Project Management will be absorbed by BSD, ITD, and SBMS Office staff at no incremental cost.

Item 25 - IT System Administration. Represents the following tasks specific to SBMS operations, which are currently done by Dan Alexander (PNNL) and supplemented by student interns at PNNL. Some form of these tasks will need to be included in any COTS solution. The only BNL incremental resources considered are \$100K for an applications programming position in the BSD.

- Installation and configuration: install and configure new applications and upgrades to existing applications required to operate SBMS
- Security management: manage security issues, including application access privileges; determine rules by which security practices will be administered across SBMS applications
- System maintenance and repair: complete investigation of reported application and web-related problems and implement fixes, as required
- System monitoring: stay abreast of SBMS performance and functionality capabilities, recommend enhancements that will enhance future operability of system
- User education and training: support Help Desk problem resolution, Weblogs education, etc. as required
- Documentation. Provide support with development of application documentation.

Item 28 - Systems Support Represents role currently performed by Heather Gelhaus at PNNL., which are detailed below. Estimates for Scenarios 2 and 3 are based on a new SBMS Office employee at the I-2 level. Estimates for Scenario 1 assume a 3% yearly escalation.

- Maintain configuration of files in QA Test Area (QA) in such a manner that QA website replicates full functionality of Production.
- Maintain configuration of files in Production area to ensure only current and authorized files are available to BNL staff.
- Maintain configuration of files in Copy of Production (ProdCopy) to provide working copies of production files to editors on an as-needed basis. (Note: Files are not refreshed from Production due to potential viral contamination of publicly available files).

- Maintain configuration of files in archive repository (SBMSHist) to provide a history of the files that were available to staff at any given time.
- When requested by SBMS editors, refresh Authqa work area with files from ProdCopy to ensure editors are working with the latest versions of files.
- Facilitate testing of new/revised content files and also coordinate any problem resolution.
- Promote files from QA to Prod, ProdCopy and SBMSHist after testing has been successfully completed and authorization from BNL SBMS POC has been provided.
- Update content metadata (Titles of documents, sections, forms, etc) in Products Table database to ensure navigational pages are maintained current with new/revised files.
- Notify BNL subscribers to SBMS Change Notification Subscription Service when major revisions to content files have been made.
- Promote database changes (e.g., Categories/Keyword Index) from QA to Production via DBMove at end of each day.
- As requested, run queries of database using MS Access and provide results to BNL.
- Make updates to content contained in the SBMS Contact List when requests for change are made.
- Obtain and place WebTrend reports in AuthQA website on monthly basis.
- Develop, maintain, and integrate desk-level operational procedures with BNL SBMS staff to ensure configuration management processes are documented and available to backup support staff.
- Participate in trouble shooting problems related to content files, website, or applications.
- Convert all Lessons Learned documents from MSWord files to HTML files according to established format and obtain authorization for test/release to staff from BNL POC.
- Convert all Facility Use Agreements from MSWord files to HTML files according to established format and obtain authorization for test/release to staff from BNL FUA POC.
- Run converter against documents (FUAs, subject areas, etc) to make “global changes” and obtain authorization for release from appropriate BNL POCs.
- As requested, convert and or edit Subject Area files from native MSWord files to HTML and obtain authorization for test/release to staff from BNL POC.
- Test 30% of new documents and 10% of revised documents to make sure they meet minimum QA acceptance criteria (versioning, format, file naming convention, link functionality, etc).
- Coordinate testing of all system (software) and application changes against established requirements and test plans.

- Report test-related problems to either content POC or IT POC for adequate problem resolution.

Item 29 - Task Management and Testing. Represented mostly by the role currently performed by of Jeff McGarrah at PNNL. In Scenarios 2 and 3, this responsibility would be performed partly by an existing position (Advanced Technology Engineer) and partly by a new system support position (see item 28 also).

The costs for task management and testing are directly correlated to the costs for application customization.

- Assist in testing 30% of new documents and 10% of revised documents to make sure they meet minimum QA acceptance criteria (versioning, format, file naming convention, link functionality, etc).
- Coordinate testing of all system (software) and application changes against established requirements and test plans.
- Report test-related problems to either content POC or IT POC for adequate problem resolution.

Item 30 - Application Customization. For Scenario 1, represented by the cost of implementing the FY03 "Priority-2" and "Priority-3" fixes from the SBMS Problem Log (Exhibit 2) in FY04 and FY05. In FY06 and thereafter, an additional 60K is anticipated for retrofitting SBMS for XML.

For Scenario 2, represented by the cost of customizing a COTS product to address issues in the SBMS Problem Log and those issues that are not solved by an out-of-the-box solution.

Item 31- Network and Communication. For Scenario 1, BNL ITD maintains software and hardware to keep a necessary firewall up, protecting BNL and PNNL networks. This is represented here as the cost for licensing of the software and hardware maintenance. The cost noted here is very conservative. The existing hardware and software are operational, but are not being supported by the vendor. The next hardware or software failure will probably involve complete replacement of the system.

Item 32- Procedural Changes, testing, content freezes; cost impact on staff productivity

For Scenario 1, represented by estimates of previous year's scheduled downtime for fix implementations. For Scenario 2, estimated to be 10 working days productivity loss over FY04 (using 2088 productive hours in a year).

**Exhibit D: Supplement to Sec. IV, Risks and Sensitivities.**

Doculabs is a research and consulting firm that helps companies plan for, select, and optimize emerging technologies through project-based services. Doculabs has provided services to BNL and is cited below where their services are relevant to risk mitigation.

(a) Critical Staff. Relying on critical staff to perform critical functions puts the organization at a high risk; staff turnover can become a crisis. The current hardware/software configuration is only used by two sites (PNNL and BNL) and is critically supported by three technical staff members at PNNL. BNL's SBMS budget was cut in FY02 and FY03, which in turn reduced the amount of money available to fund PNNL staff; critical staff at PNNL have been assigned alternative duties. If Scenario 1 is implemented, the SBMS Office will continue its reliance on three critical IT staff members to address complex root cause analysis and implement solutions. The impact of staff turnover or staff reassignment at critical times will be severe. In Scenario 2, a COTS system outsources the majority of this risk to a commercial vendor whose business is to support this application; BSD resource management will provide mitigation of the minor application support provided by BSD.

(b) Support loss. BNL is PNNL's only external customer for the SBMS system. PNNL could decide at some point to change strategy and go with a COTS solution. If so, BNL may be poorly positioned to implement a new solution. With a COTS solution, the event could occur if the product is dropped from a vendor's line or a corporate takeover occurs; both these risks are mitigated by using Doculabs's industry assessment before vendor selection.

(c) Battelle impact. BNL's utilization of the PNNL, another Battelle laboratory, presents certain cost benefits and prestige to one of their laboratories and Battelle, respectively. These benefits could be at risk with Scenarios 2 and 3, and there could be a perception of BNL abandoning the SBMS product. This perception can and should be mitigated with the clear message that in proactively addressing the risk associated with the SBMS application, BNL is indicating its complete commitment to the true Battelle signature item: The Standards-Based Management System itself.

(d) Requirements definition. The requirement specifications for PNNL's SBMS are dated and/or incomplete for various features of SBMS. System documentation is not complete. For the system development stage of a COTS solution, this risk is mitigated by utilizing Doculabs to define our requirements.

(e) State-of-art technology. Changing technologies and newly emerging standards for web-content management provide cost-effective solutions for meeting SBMS goals to improve productivity and to offer better products. We are poorly positioned to take advantage of these technologies and standards.

(f) Knowledge management strategies. BNL has broad knowledge-management needs that would be well addressed by an integrated approach; that is, content-management solutions that can easily interface with other mission-critical systems at BNL. A solution that scales up functionally from the SBMS function, or integrates with other solutions to meet broader implementation goals (records management, human resources, fiscal, for example), represents a tremendous opportunity to streamline BNL's information/knowledge management processes. A slightly riskier approach than Scenario 2 would be Scenario 3, where the application management for SBMS and other mission-critical systems would be consolidated into one division at BNL. The highest risk for lost opportunity is in Scenario 1, where SBMS is maintained by application programmers at PNNL who have no understanding of BNL's larger knowledge management needs and could not be expected to have imaginative thinking about meeting those needs.

(g) Productivity. Several productivity improvements have been proposed for the current system and shelved due to high implementation costs (e.g., database changes). Some issues prevail due to the location of the servers. For example, production staff at BNL depend on the responsiveness of the Internet in order to get their day-to-day work done. And the current networking configuration, which is necessary to provide adequate cyber security to BNL and PNNL, requires SBMS desktops be handled by BNL cybersecurity, ITD support, and SBMS workstation users on an exception basis.

(h) Cost savings. Our operational costs could be lowered by \$200K per year once implementation of a COTS solution is complete.

### **Risk Index Calculations.**

Indexes for Probability of Occurrence:

Certain - 4

Probable - 3

Possible -2

Improbable -1

Indexes for Impact:

Catastrophic - 4

High - 3

Moderate -2

Low - 1

Scenario 1.

Risk Factor	Probability of Event Occurrence		Impact if Event Occurs		Index
	$P_E$		$I_E$		$P_E \times I_E$
(a) Critical staff	Certain	4	Cat	4	16
(b) Support loss	Possible	2	Cat	4	8
(c) Battelle impact	Improbable	1	High	3	3
(d) Requirements definition	Possible	2	Low	1	2
(e) State-of-art technology	Certain	4	High	3	12
(f) Knowledge-management strategies	Certain	4	High	3	12
(g) Productivity	Probable	3	High	3	9
(h) Cost savings	Probable	3	High	3	9
$\sum_{index}$					71
$\sum_{index/10}$					7.1

Scenario 2.

Risk Factor	Probability of Event Occurrence		Impact if Event Occurs		Index
	$P_E$		$I_E$		$P_E \times I_E$
(a) Critical staff	Possible	2	Cat	4	8
(b) Support loss	Improbable	1	Cat	4	4
(c) Battelle impact	Improbable	1	High	3	3
(d) Requirements definition	Possible	2	High	3	6
(e) State-of-art technology	Improbable	1	High	3	3
(f) Knowledge-management strategies	Improbable	1	High	3	3
(g) Productivity	Possible	2	High	3	6
(h) Cost savings	Possible	2	High	4	8
$\sum_{index}$					41
$\sum_{index/10}$					4.1

Scenario 3.

Risk Factor	Probability of Event Occurrence $P_E$		Impact if Event Occurs $I_E$		Index $P_E \times I_E$
(a) Critical staff	Improbable	1	High	3	3
(b) Support loss	Improbable	1	High	3	3
(c) Battelle impact	Possible	2	High	3	6
(d) Requirements definition	Possible	2	Cat	4	8
(e) State-of-art technology	Certain	4	High	3	12
(f) Knowledge-management strategies	Probable	2	Mod	2	4
(g) Productivity	Probable	3	High	3	9
(h) Cost savings	Probable	3	High	3	9
$\sum_{index}$					54
$\sum_{index}$					5.4

## **Exhibit E: Service Level Agreement with PNNL**

Brookhaven National Laboratory (BNL)

# **Standards-Based Management System (SBMS) Service Level Agreement**

*February 18, 2002*

*Version 2.0*

### **Approvals**

### **Date**

Terry Maugeri

\_\_\_\_\_

BNL SBMS Manager

Rex (Trav) C. Stratton

\_\_\_\_\_

PNNL IS&E Business Information Systems II Manager

Jerry Johnson

\_\_\_\_\_

PNNL IRMS Steward

**Revision History**

<i>Revision No.</i>	<i>Description</i>	<i>Release Date</i>
1.0	Original version	7/18/00
1.1	FY02 version, 1 <sup>st</sup> draft	1/16/02
1.2	FY02 version, 2 <sup>nd</sup> draft	1/17/02
2.0	FY02 final version	2/18/02

**Purpose**

The purpose of this document is to define the Service Level Agreement (SLA) for fiscal year 2002 between the Pacific Northwest National Laboratory's (PNNL's) Information Sciences & Engineering (IS&E) Standards-Based Management System (SBMS) project team leadership and the Brookhaven National Laboratory's (BNL's) SBMS leadership for the operation and management of the BNL SBMS production information systems environment. Service levels described in this document will form the basis for PNNL support of the BNL SBMS environment, allocation of supportive resources, and establishment of performance levels required for effective and efficient system operation. The SLA provides a definition of required services, support levels, and remedy processes.

**Roles and Responsibilities**

Internal Sponsor	Who provides IS&E SBMS project oversight?	Business Information Systems II Technical Group Manager	Rex (Trav) C. Stratton
Project Manager	Who represents the services provided by this agreement?	BNL SBMS Project Manager	Tim Strycker

**Term of Agreement**

This agreement is effective through the end of the current fiscal year. It will be automatically renewable each fiscal year thereafter beginning on October 1. If any terms or conditions of this agreement need to be modified, the SBMS Project Manager will work with the other points of contact to update the document and have it approved by the same representatives (or their successors) that approved this document. This agreement will remain in effect until superseded by a new agreement or explicitly voided by all parties.

**Scope**

The BNL SBMS operational environment consists of six Windows NT-based servers and associated software. These computer systems are owned by BNL. The server names and locations are:

<u>Name</u>	<u>Location (at PNNL)</u>
BWPROD	Math/1316
BDPROD	Math/1316
BWAUTH	Math/1316 (to be replaced by authqa2 server, which will be located at BNL, on or about 3/1/02)
BDAUTH	Math/1316
BWDEV	Math/1316
BDDEV	ISB1/208

BNL SBMS uses certain components of the PNNL infrastructure in the conduct of its operations. The two development servers (BWDEV and BDDEV) currently reside on the PNNL network. The BNL SBMS also utilizes a fiber optic link from the PIX (VPN) through existing PNNL networking infrastructure to ESNET in order to connect to Brookhaven.

This use is conditional on minimal or no-impact to existing applications resident on the PNNL servers. If the BNL SBMS causes degraded performance or other infrastructure impacts, BNL will upgrade hardware, if appropriate, or will discontinue use of the PNNL infrastructure within a period of time agreeable to both PNNL and BNL.

FY02 BNL funding to support the terms of this agreement will be \$145K. System Administration and general support of the servers will be funded at \$85K and Help Desk support for operational support and problem resolutions will be \$60K.

## Services Provided by PNNL

The PNNL will provide the following basic support to the BNL SBMS:

### Service Levels:

Three levels of PNNL support and problem resolution will be provided.

- Priority 1 or critical system failures (Laboratory staff cannot use any given production-level SBMS product, application, or utility and it impacts work assignments). Action will be taken immediately after problem notification. Problem resolution will normally be achieved within 2 hours, or status will be provided on the progress of the work and expected restoration time.
- Priority 2, non-critical system failures (bugs or problems that do not prevent use of SBMS). Problem investigation will begin within two working days of problem notification. Problem resolution will normally be achieved within four weeks, or as otherwise negotiated. Weekly reporting will be performed and priorities of work assignments will be made by BNL.
- Priority 3, low priority system failures (system upgrades, cosmetic changes, and equipment relocation). Problem resolution will be started as staff become available, part of a normal upgrade or version change process, or not at all. For these problems, commitment to resolution shall be discussed and negotiated as to whether or not the problem should be addressed.

All reported problems will be tracked on a problem log and all work in resolving these problems will be approved by BNL.

### Primary Service Hours Support:

The SBMS environment is designed to be available to BNL staff 24 hours a day, 7 days a week. PNNL's primary hours of operation (in Pacific Standard Time) are 7:00 a.m. to 4:30 p.m. Monday through Friday, excluding PNNL holidays. Primary hours of operation are defined as the period when system availability and support from staff resources are optimal. During primary hours of operation, initial response to detected problems or failures will not exceed those times outlined in the Service Levels section of this document.

### Off-Hour Support:

Off-hour support is available for all system services through an on-call program. The on-call program affords off-hour support for Priority 1 problems by providing one PNNL staff member from the SBMS project team as a point of contact. The on-call person will be responsible for initiating a problem resolution process, including reporting the problem to appropriate project management and contacting the system administrator(s) responsible for resolving it. Resolution of problems that are something other than Priority 1 will not be initiated until the primary hours of operation. The on-call staff member will attempt to correct the problem from a remote location. If the problem cannot be resolved remotely within 2 hours, the staff member will travel to the site (PNNL) and continue problem resolution.

### System Recovery

#### Equipment Failure

Initial response will be immediately upon notification of the failure. Replacement of SBMS components will be performed with on-site spares when possible. If the parts are not on-site, replacement parts will be ordered from the vendor as soon as practical, but no later than within 48 hours.

### **Power Outage**

SBMS equipment is connected to a UPS with sustained power support of 30 minutes. The probability of power failures that will last longer than the capacity of the UPS are expected to occur no more frequently than 3 times per year, based on prior history, resulting in an average down time of 2 – 3 hours per occurrence. A process is in place to notify the PNNL on-call staff whenever power failures occur. Refer to “Off-Hour Support” for Priority 1 problem resolution.

### **Regular Maintenance and System Backup:**

Service packs and upgrades to operating system and services will be applied to systems during scheduled outages in concert with corresponding upgrades to similar systems managed by the project. Every effort will be made to schedule routine maintenance outside of primary hours of operation. The schedule of routine maintenance will be announced in advance to the SBMS users via the online “Scheduled Maintenance” link. Upgrades and patches to software will be done first on development equipment and will be fully tested. All upgrades and patches to production equipment will be scheduled and approved in advance by BNL.

Data stored within the SBMS environment on the servers will be backed up during non-business hours each business day using differential backups and backed up weekly using full backups. A five-week rolling pool of full weekly backups will be kept in a secure facility and will be verified at the time the backup is performed. The most recent system backups will be stored offsite.

### **Configuration Management:**

The SBMS project will provide the configuration management of all SBMS equipment. All changes to the equipment, the operating system, services, and application software will follow procedures specified in the SBMS Configuration Management Plan. BNL will be provided notification of any configuration change that may affect this system.

### **Other Services Provided**

Additional support services provided by PNNL include specific services and documentation that modify the production BNL SBMS environment. It also includes support services for applications and procedures that are not part of the standard BNL SBMS environment. These include:

- SBMS strategic planning (representing the BNL SBMS site in PNNL resource planning)
- SBMS weekly, monthly and quarterly reports
- Application bug fixes
- Root cause analysis determinations and problem investigations (after system diagnostic check)
- Maintenance of system operating procedures/documentation
- Travel in support of BNL SBMS systems
- Training for SBMS specific hardware and applications (e.g. WebTrends, Oracle, etc.)

### **Services Not Covered By This Agreement**

BNL SBMS may require additional support services that are not included within this agreement. These services include:

- System development and enhancements

- Creation and update of procedures and system documentation associated with system enhancements
- Server room floor space charges, if applicable
- Authqa2 server support (see Appendix A for details of this server's support)
- Content development and content configuration management

## **Appendix A - Authqa2 Server Support**

The Authqa2 server will physically reside at BNL and be configured to function as a web server or a combination web and database server, depending on the needs of the site. This server will eventually replace the authqa server currently residing at PNNL. Support of the server will be provided by BNL and PNNL, with BNL providing first-tier support and problem resolution response. The specific support responsibilities for both sites are as follows:

### **BNL**

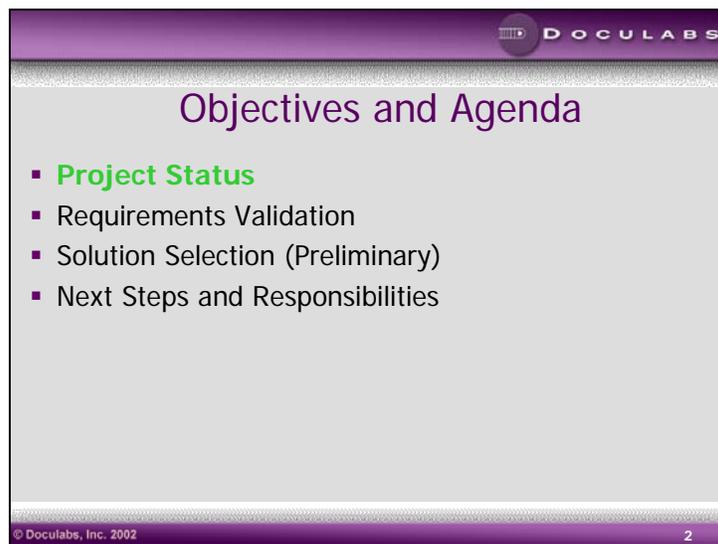
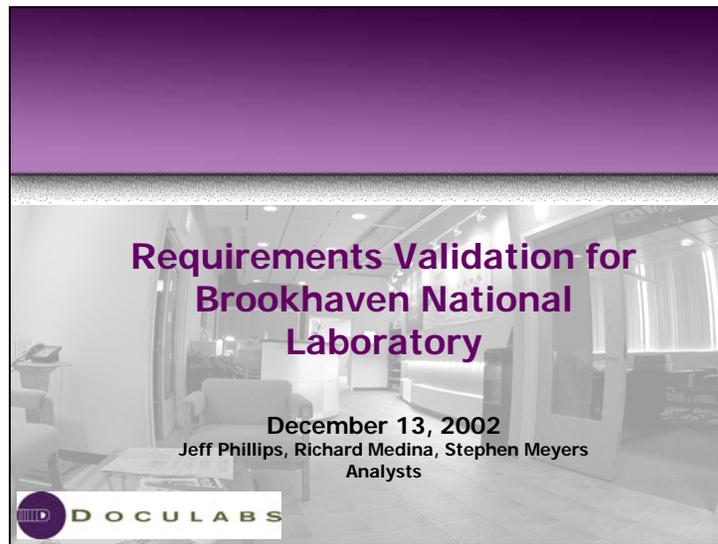
Server hardware maintenance  
Virus Scan  
Backup/Restore  
Capacity monitoring  
Performance monitoring  
Security updates, audits, and administration  
Primary web administration  
Primary Oracle administration  
Primary OS maintenance and administration  
System modifications and updates  
Network infrastructure  
Software licensing and renewal  
Operations Guide updates

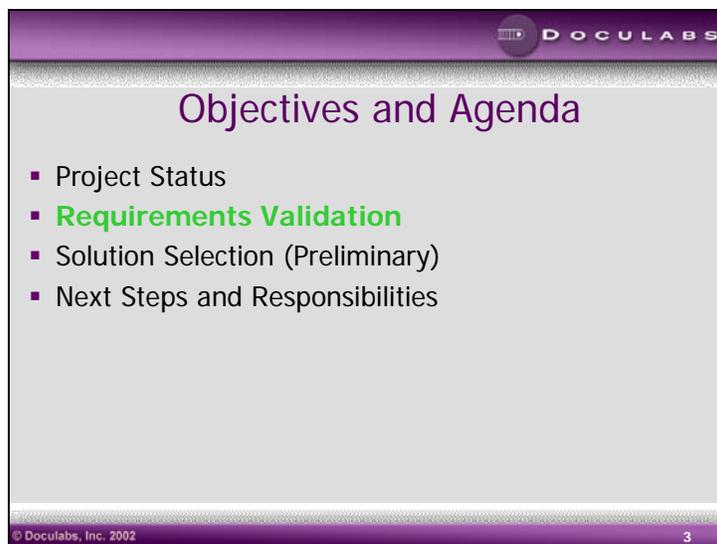
### **PNNL**

Initial creation of server Operations Guide  
Application administration -- second-tier support for trouble-calls from BNL clients  
Web and Oracle support -- second-tier support for trouble-calls from ITD  
Application updates -- SBMS application updates needed to support client enhancement requests  
Database data management -- Database architecture and schema changes

**BNL will keep PNNL informed of all modifications to the SBMS application as well as the IIS /web, Oracle, OS, and server configurations. BNL will implement a shared system configuration log that documents any changes to the system.**

**Exhibit F: Presentation, Doculabs (12/02)**





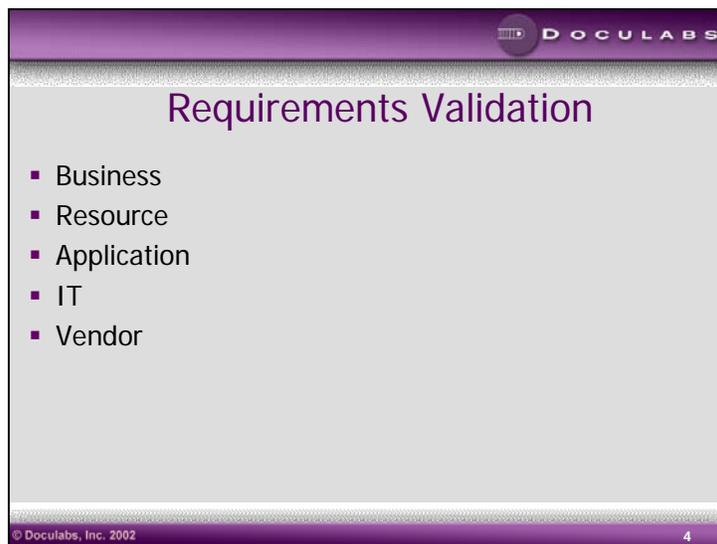
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## Objectives and Agenda

- Project Status
- **Requirements Validation**
- Solution Selection (Preliminary)
- Next Steps and Responsibilities

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## Requirements Validation

- Business
- Resource
- Application
- IT
- Vendor

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## General Conclusions

- Primary focus: to enable BNL staff to manage external requirements and associated processes
  - Editorial, database, requirements management
- SBMS currently fails in several critical areas
  - Business, resource, application, IT, vendor requirements
  - Fails at basic requirements, precludes extension to standard and advanced requirements
- Secondary focus: to address business requirements in other BNL processes

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## General Conclusions

- Balancing business values (benefits, resources, risks)
  - BNL's ECM strategy is extremely constrained by resource and risk issues
  - Any modification of SBMS must have low TCO, require few resources to develop, deploy, administer, maintain, use
  - It must minimally provide the same level of functionality

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## General Conclusions

- **Balancing business requirements**
  - Requirements management has complete priority
    - ◆ Address other processes insofar as that doesn't jeopardize the primary focus
    - ◆ ...and insofar as they provide a better chance of primary focus success
  - But BNL must have an ECM strategy for the other processes
    - ◆ This will be key factor solution selection and deployment strategy

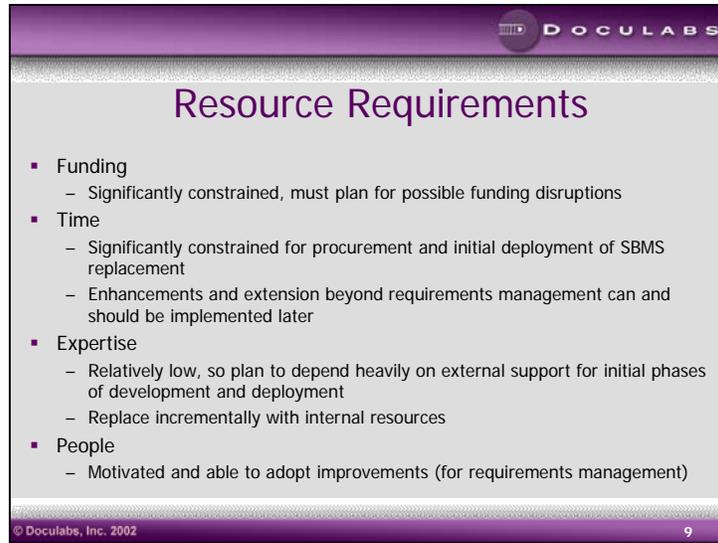
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## Business Requirements

- **Cost reduction**
  - Eliminate PNL license fees, reduce support costs, eliminate expensive custom development
- **Operational efficiency**
  - Reduce cycle time of document creation and publishing
  - Oversight, communication, collaboration
- **Risk reduction**
  - High, increasing risk of software and support failure
- **IT Consolidation, strategic enablement**

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## Resource Requirements

- Funding
  - Significantly constrained, must plan for possible funding disruptions
- Time
  - Significantly constrained for procurement and initial deployment of SBMS replacement
  - Enhancements and extension beyond requirements management can and should be implemented later
- Expertise
  - Relatively low, so plan to depend heavily on external support for initial phases of development and deployment
  - Replace incrementally with internal resources
- People
  - Motivated and able to adopt improvements (for requirements management)

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## SBMS Application Requirements

- Web Content Management
- Document Management
- Lifecycle Management
- Process Management
- Imaging
- Search and Retrieval

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## Web Content Management Requirements

- Web interface for creation and authoring
- Integration with Front Page and Dreamweaver
- Support for multiple content types
- Support for version control
- Support for business rules in templates (e.g. mandatory fields)
- Reusable templates for layout and design
- Support subscription/notification services

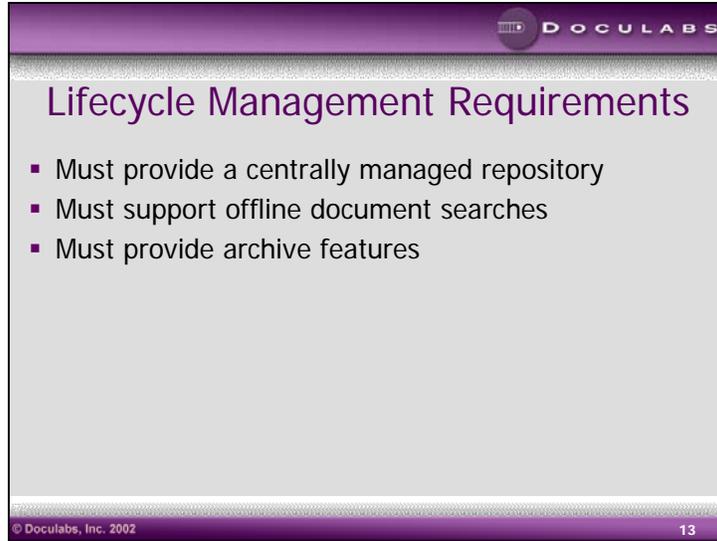
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## Document Management Requirements

- Near term format support: images, HTML files, e-mail, Microsoft Word, Visio, and PDF files
- Version control
  - Documents are revised daily
  - Essential for Editors to collaborate with SMEs
- Must support library services
  - Current workflow doesn't use library services, but would benefit from it
  - Future collaborative workflows will require it

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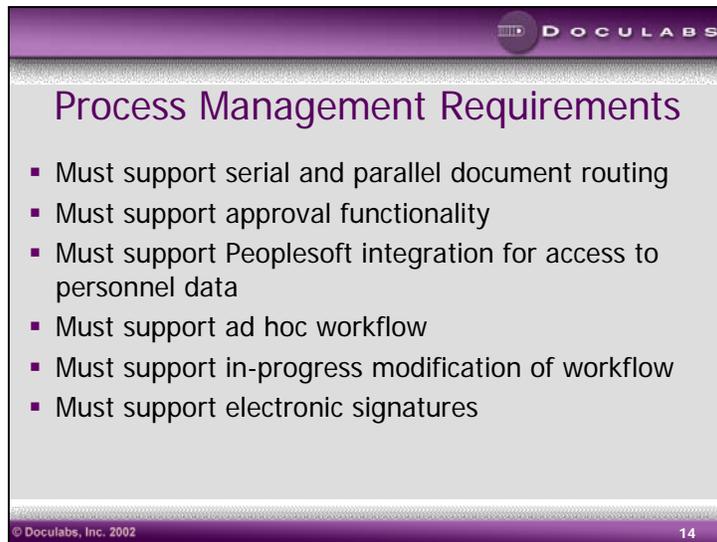
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## Lifecycle Management Requirements

- Must provide a centrally managed repository
- Must support offline document searches
- Must provide archive features

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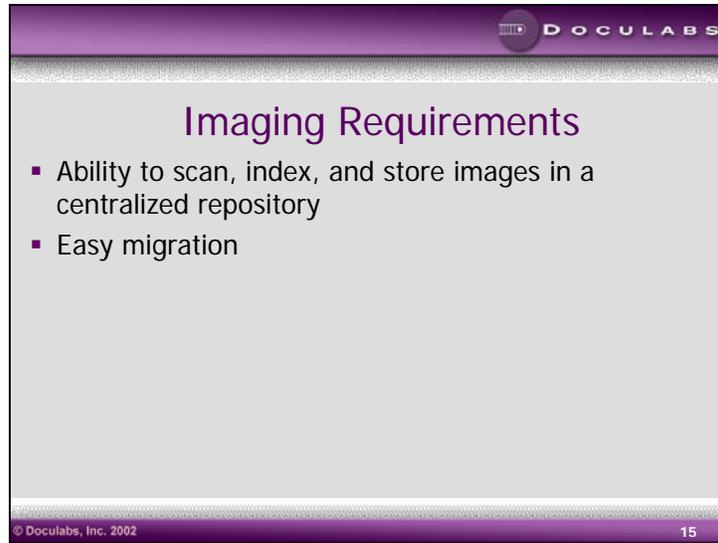
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## Process Management Requirements

- Must support serial and parallel document routing
- Must support approval functionality
- Must support Peoplesoft integration for access to personnel data
- Must support ad hoc workflow
- Must support in-progress modification of workflow
- Must support electronic signatures

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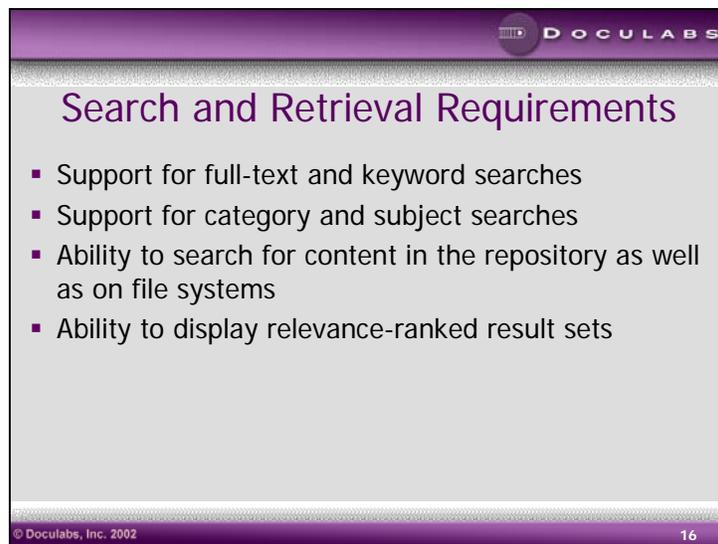
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## Imaging Requirements

- Ability to scan, index, and store images in a centralized repository
- Easy migration

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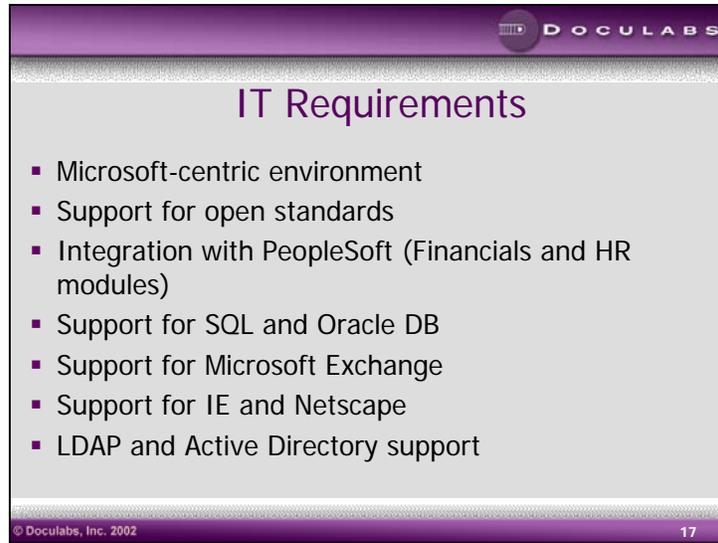
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## Search and Retrieval Requirements

- Support for full-text and keyword searches
- Support for category and subject searches
- Ability to search for content in the repository as well as on file systems
- Ability to display relevance-ranked result sets

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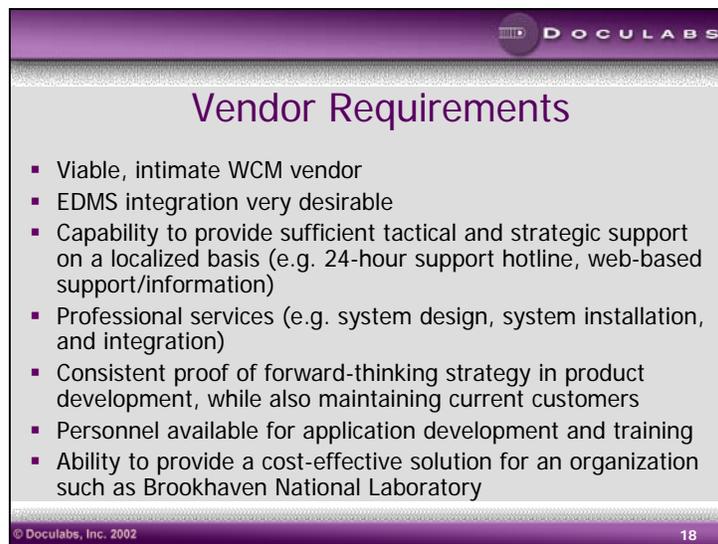


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## IT Requirements

- Microsoft-centric environment
- Support for open standards
- Integration with PeopleSoft (Financials and HR modules)
- Support for SQL and Oracle DB
- Support for Microsoft Exchange
- Support for IE and Netscape
- LDAP and Active Directory support

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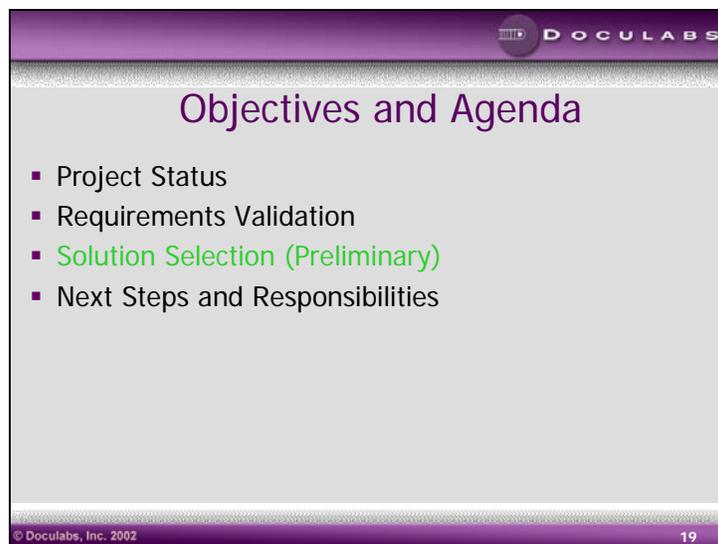


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## Vendor Requirements

- Viable, intimate WCM vendor
- EDMS integration very desirable
- Capability to provide sufficient tactical and strategic support on a localized basis (e.g. 24-hour support hotline, web-based support/information)
- Professional services (e.g. system design, system installation, and integration)
- Consistent proof of forward-thinking strategy in product development, while also maintaining current customers
- Personnel available for application development and training
- Ability to provide a cost-effective solution for an organization such as Brookhaven National Laboratory

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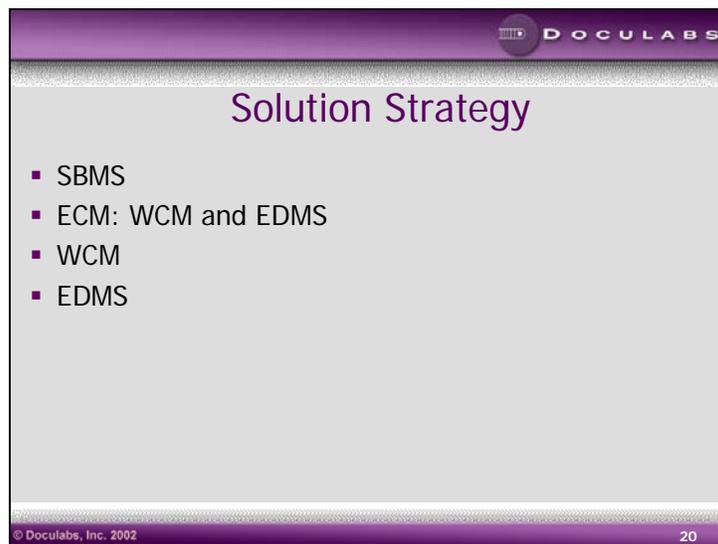
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## Objectives and Agenda

- Project Status
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## Solution Strategy

- SBMS
- ECM: WCM and EDMS
- WCM
- EDMS

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## Short List

- FatWire
- Stellent
- Gauss
- Identitech
- Hyland

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## Objectives and Agenda

- Project Status
- Requirements Validation
- Solution Selection (Preliminary)
- **Next Steps and Responsibilities**

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## Next Steps and Responsibilities

- Solution Comparison and Recommendation (Doculabs)
  - Compare several vendor solutions and recommend the best fit for BNL's needs
- RFP Creation (BNL)
- RFP Review and Feedback (Doculabs)
- Distribute RFP (BNL)
- Vendor Facilitation (Optional – Doculabs and BNL)
  - Vendor presentations and in-depth question/answer session

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23