MANITOBA HYDRO

2012/13 & 2013/14 ELECTRIC GENERAL RATE APPLICATION

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Request at Transcript Page #5098-5099

MH to file the historical CPJ's for the Enterprise Asset Management Program.

Response:

Please see the following table for a summary of the EAM project estimate and in-service date. Please note that the in-service date provided in MH Exhibit #97 (MH undertaking #81) of July 2013, should have indicated an in-service date of October 2013.

The CPJ for the Enterprise Asset Management Program is attached.

Item	Date Approved	Amount	In-Service	Comments
CPJ	December 2011	$19.3 million	December 2012	The scope of the project is confined to current user areas of AMPS in Power Supply (Generation South, Generation North, HVDC, and Engineering Services) and Transmission (System Support, Communications) including their associated maintenance engineering, design, and project departments. The project shall consist of the following: - Implementation of core functionality (Personnel, Equipment Hierarchy, Work identification, Planning, Scheduling, Execution, Documentation and Analysis), - Personnel availability and shift schedule creation in HR, - Accounting structure creation, - Tool and parts ordering, - Event entry tied to Power-Up and HDS&R, - Change management and workflow, - Lockout/tagout to a level sufficient to identify clearance points and print permits and tags, - Mobile computing and predictive maintenance tasks created to allow equipment condition data to be entered during work orders, - The interfaces to Equipment Condition for Asset Investment Planning, Reliability Centered Maintenance and Root Cause Failure Analysis software, the Laboratory Information Management System (LIMS), and the Communications GIS, and - Development of new processes and training of users.
Update to Estimate	April 2012	$18.6 million	December 2012	The amount was adjusted by accounting which was a reduction in overhead allocated to the project to accommodate a transition to IFRS.
Update to In-service date	November 2012	$18.6 million	October 2013	The change in the in-service date resulted from the requirements gathering phase being more involved than anticipated.

MANITOBA HYDRO
CAPITAL PROJECT JUSTIFICATION

Project Name

Enterprise Asset Management (EAM) Phase 2

Recommendation

Replace the computerized maintenance management system known as AMPS (Applied Maintenance Planning System) with an EAM, at an estimated total project cost of $19.3M with a planned start date of January, 2011 and completion date of November, 2012.

Project Scope

The scope of the project is confined to current user areas of AMPS in Power Supply (Generation South, Generation North, HVDC, and Engineering Services) and Transmission (System Support, Communications) including their associated maintenance engineering, design, and project departments. The project shall consist of the following:

- Implementation of core functionality (Personnel, Equipment Hierarchy, Work identification, Planning, Scheduling, Execution, Documentation and Analysis),
- Personnel availability and shift schedule creation in HR,
- Accounting structure creation,
- Tool and parts ordering,
- Event entry tied to Power-Up and HDS&R,
- Change management and workflow,
- Lockout/tagout to a level sufficient to identify clearance points and print permits and tags,
- Mobile computing and predictive maintenance tasks created to allow equipment condition data to be entered during work orders,
- The interfaces to Equipment Condition for Asset Investment Planning, Reliability Centered Maintenance and Root Cause Failure Analysis software, the Laboratory Information Management System (LIMS), and the Communications GIS, and
- Development of new processes and training of users.

Background

AMPS is the system used by Power Supply Generating and Converter Stations and Transmission Communications and System Support to manage maintenance and operations work, materials and tools. The program was initially placed in service in the early 1990's, and is a text based DOS-aged application. AMPS has approximately 1200 users.

The Power Supply IT Steering Committee approved formation of a team in January, 2005 with the mission to "Provide a fully integrated Computerized Maintenance Management System (CMMS) that supports Asset Management processes for current user areas of AMPS in Power Supply and Transmission." The team, with the firm Synterprise Global Consulting, completed a present state analysis of all user areas and reviewed two potential vendors to confirm available functionality and establish costs and potential benefits. The team recommended implementation of an EAM, phased into a Data Integrity phase to clean operating data and implement standard work process, followed by implementation of the Core Functionality of the EAM (Phase 2).

Power Supply has completed a Work Management System, consisting of process standards and accompanying measures to move towards best in class performance. Work Management System measures are in place for all stations, and are being used to guide improvement. Data Integrity will be completed by December, 2010.

JUSTIFICATION—BUSINESS CASE ANALYSIS (SUMMARY):

Justification and Link to Corporate/Business Unit Goals

The recommended alternative is to replace AMPS with EAM as per the Context Diagram.

The most significant financial benefit from implementation of EAM is derived from avoiding a future decrease in availability. This is achieved by ensuring all required operations and maintenance work is completed in an optimal fashion, and equipment condition information, maintenance tactics, and work processes are supported to maximize availability. Significant opportunity for improvement was noted by a quantitative analysis completed in conjunction with Synterprise Global Consulting in May, 2005, and confirmed by the work completed by the EAM Data Integrity team and Power Supply process measures.

The value of this benefit is estimated at $4.85M per year as per the EAM Benefit Summary.

EAM is expected to provide compliance reporting for quality, legislated, and customer specified programs (safety, environment, Dam Safety, NERC, MISO).

EAM is required to provide accountability for operations and maintenance work performed to support Joint Venture partnership agreements. The present systems do not provide auditable reporting inclusive of all work groups.

EAM will improve the accuracy and usability of asset data, and will provide an improved user interface. EAM will also provide technology improvements and supporting processes to capture equipment information, preventing loss due to retirements and preparing staff for the future. EAM provides the foundation for achieving the Power Supply Asset Management strategy.

The recommended alternative primarily supports Power Supply Goal 2: Provide a reliable and dependable supply of power…and Goal 5: Optimize operations, exports and development to minimize net cost to Manitoba customers, and Transmission Goal 4: Maintain, operate and expand the system efficiently and cost effectively. The recommended alternative has been pursued by all leading utilities in North America. Maintenance for Distribution equipment was moved into SAP in 2006.

The “Do Nothing” alternative results in decreased availability, reduced performance and prevents compliance with safety, environment, Dam Safety, NERC, MISO, and Joint Venture partnership reporting requirements. The Do Nothing alternative does not support the required processes for Asset Management, and jeopardizes the investment in Data Integrity.

Deferral has resulted in a loss of annual benefits, a loss of qualified staff, and a loss of corporate knowledge. Continued deferral will undermine current efforts to support and build upon a system of standards, leading to further deterioration /diversification of work processes that will increase future project cost. Deferral may also result in non-compliance with safety, environment, Dam Safety, NERC, and MISO program requirements. Deferral will prevent creation of auditable Joint Venture partnership reports.

Upon project completion, additional operating costs will be required for Information Technology Services ($479k per year for software annual maintenance) and may be required for Power Supply (up to $500k per year for centralized support personnel).

Capital Project Justification

ANALYSIS OF ALTERNATIVES:

Economic Analysis		
Discount Rate	**For current corporate rates see G911 6.1%**	**For clarification on hurdle rates, contact the Economic Analysis Department**

Recommended Option	NPV (= PV of BENEFITS - PV of COSTS)
EAM (Business case based on an 15 year software lifetime)	$19.4M

Other Alternatives Considered	NPV (= PV of BENEFITS - PV of COSTS)
Do Nothing	0

Risk Analysis

There is a risk of failure to maintain data integrity and process standardization in all work groups, resulting in loss of project benefits and increased costs from Phase 2. The mitigation strategies are to continue Executive sponsorship, to maintain the process measures, to ensure compliance with the change management process, and to complete change during the project period with project personnel.

There is a risk of loss of personnel with Asset Management process knowledge to continue to meet project needs, resulting in project schedule delays and increased project costs due to interest and escalation and deferred benefits. The mitigation strategy is to train replacement staff (many Planner courses completed).

There is a risk of loss of personnel with process knowledge to continue to meet operating needs, resulting in operations and maintenance work completion problems. The mitigation strategy is to train replacement staff (many Planner courses completed), to centralize change, and to backfill essential positions during the project..

There is a risk of scope increase in Communications and System Support due to lack of Data Integrity work prior to the project. This has been addressed by adding dedicated Subject Matter Experts to the project team.

The most significant intangible cost of this work is the significant process change. This has been mitigated by process consistency implemented during Data Integrity, and the addition of trainers and Change Management personnel to the project team.

There is a risk of project cost estimate errors. This risk was mitigated by comparing the EAM costs to other major IT projects, by completing significant prework on user processes and data integrity, by involving a consultant in the project vendor selection and costing, and completing a cost estimate sensitivity analysis to ensure adequate project contingency.

There is risk that the benefits will not be obtained if users do not adopt the new software functionality. This was mitigated by incorporating user approval and buy-in at the beginning of Phase 2, and continued discussions with Engineering Services and the Maintenance Engineering departments. The project has governance and leadership in place to ensure benefits are obtained.

RESOURCE REQUIREMENTS AND CAPITAL BUDGET ESTIMATE:

Resource Requirements

The following internal resources are estimated to complete the EAM project:

		2010/11	*2011/12*	*2012/13*	*Total*
Phase 2	**EAM Staff Team (Hrs)**	**7,400**	**47,100**	**28,200**	**82,700**

The following consultant resources are estimated to complete the EAM project ($M):

		2010/11	*2011/12*	*2012/13*	*Total*
Phase 2	**Consulting**	**0.21**	**1.65**	**0.58**	**2.44**

The following total project costs are estimated to complete the EAM project ($M):

		2010/11	*2011/12*	*2012/13*	*Total*
Phase 2	**Total Project**	**3.12**	**8.82**	**7.36**	**19.30**

Proposed Schedule

EAM Phase 2 is proposed to start in January, 2011 with an in-service date of December, 2012.

Related Projects

AIP (Asset Investment Planning)
PRIMAVERA to SAP Integration
Meridium (Reliability Centered Maintenance)
Mobile Infrastructure Setup

Reference Documents

CER - EAM Phase2
EAM Benefit Analysis Summary
EAM Phase 2 Project Cost Estimate
EAM Phase 2 Project Plan
Project Team Organizational Charts
Context Diagram
Input & Summary Sheet and Breakeven bar-graph
EAM Phase 2 Project Staffing Strategy/Operational Budget Implications

Available on MPower:

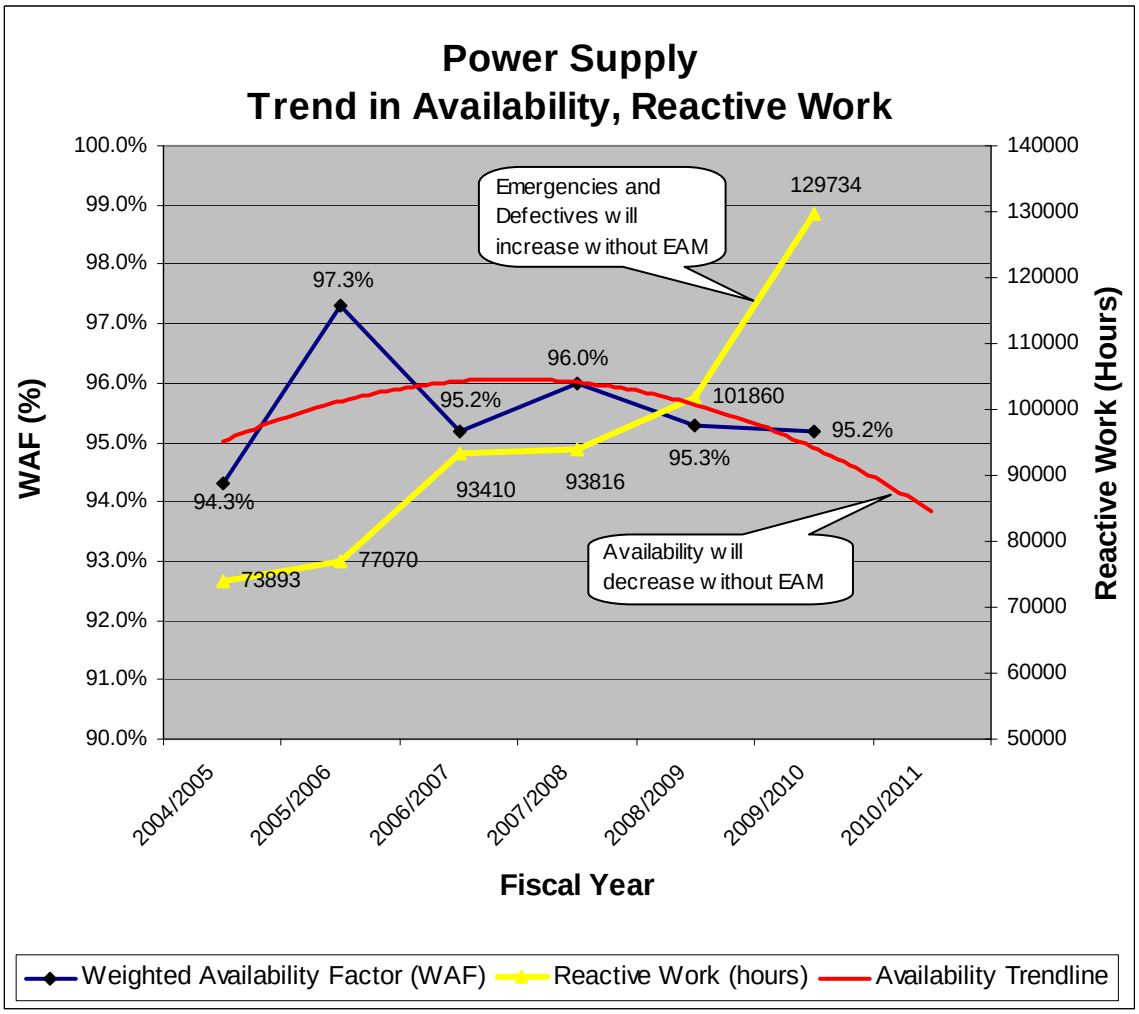
- CMMS Replacement Business Case – Synterprise Global Consulting, June 2005.
- Power Supply Work Management System Standards
- EAM User Requirements

EAM Benefit Summary

The annual benefit of implementing EAM is estimated as $4.85M per year for 15 years from system in-service.

The most significant financial benefit from implementation of EAM is to provide functionality to ensure all required operations and maintenance (O&M) work is completed in an optimal fashion, and to support the use of equipment condition information, maintenance tactics, and work processes to maximize availability. Significant opportunity for improvement was noted by Synterprise Global Consulting in May, 2005, and confirmed by the EAM Data Integrity team and Power Supply process measures. If the EAM is not implemented, it is forecast that Power Supply availability gains in early 2000's will be lost and reactive work will increase, causing availability to decrease as per the following graph:

Figure 1 - Forecast Power Supply Availability



EAM will also realize benefits in the following areas:

O&M Budget Reductions: EAM will provide improved functionality and efficiency to reduce O&M additions to meet increasing workloads.

Safety, Environment, Dam Safety, NERC: Increased system utilization by all groups (including Engineering), improved work planning and scheduling, and the integration of data from other sources to improve work execution and reporting will lead to improved performance and reduced non-compliances in these key programs.

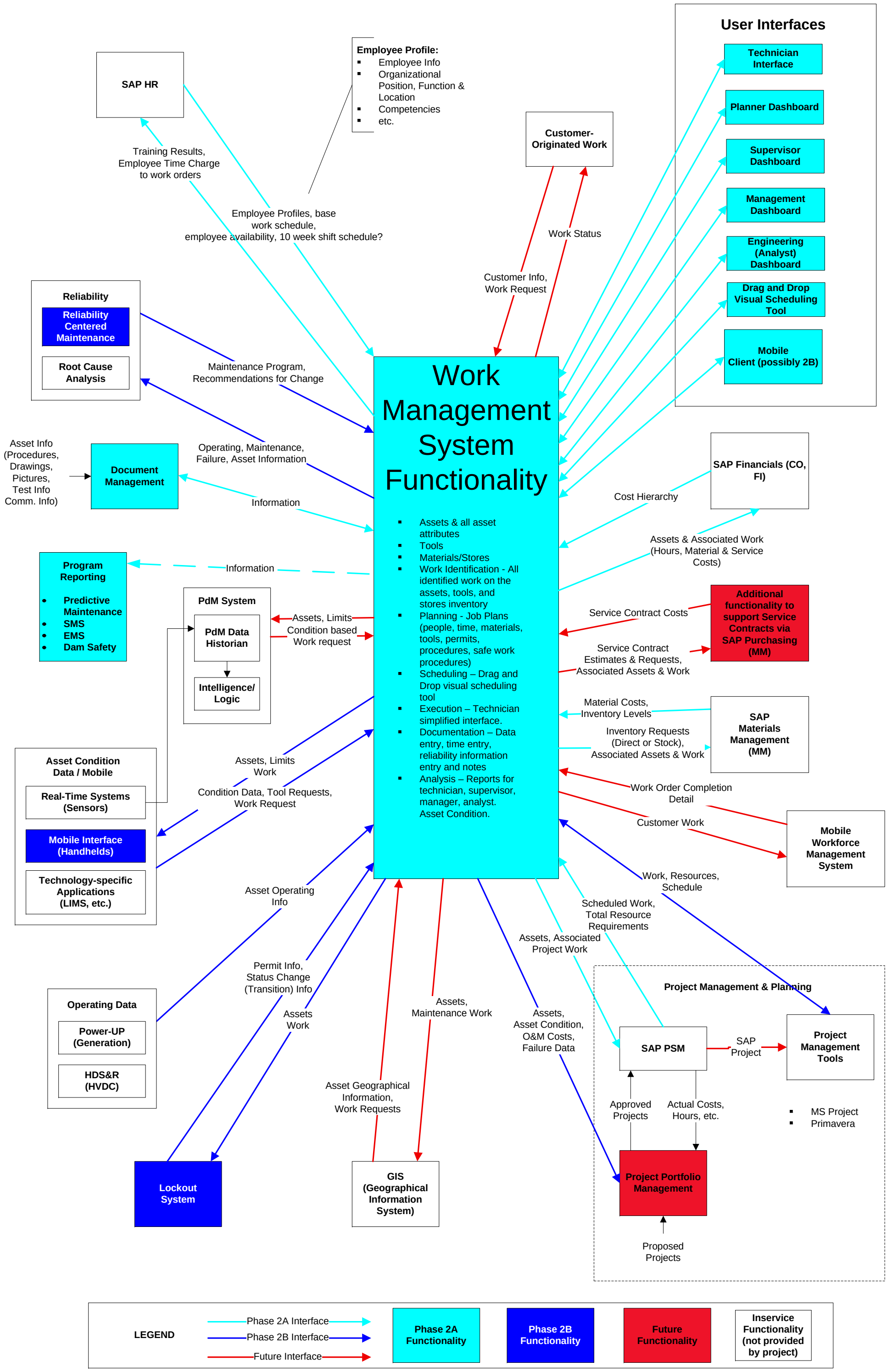
Capital Budget Reductions: EAM will reduce equipment replacement costs through improved integration of capital work with station work processes and improved knowledge of equipment condition in making repair/replacement decisions.

Partnership Agreement: EAM is required to provide reports to justify charges to Partners for operation and maintenance of shared assets.

Reliability Analysis Processes: EAM will decrease analysis costs and improve integration of Reliability Analysis, Reliability Centered Maintenance and Root Cause Failure Analysis with the maintenance work processes.

Improved Data Integrity: EAM will avoid duplication of human resource data, asset data, documents, operating data, financial data, materials data, and predictive maintenance data. EAM will allow removal / avoid development of duplicate systems and processes for this data.

EAM Project - Context Diagram (2009)



EAM Project – System Context Diagram