

SAP DEPLOYMENT AT SASKPOWER MAKES UTILITY A SHOWCASE FOR OTHERS

By Don Horne

Today's utilities are feeling the ravages of age: the departure of decades of knowledge through retirement, and assets that demand more and more maintenance to keep functioning.

How do you pass along decades of knowledge from retiring workers to a

SaskPower is a utility that serves 441,000 customers and owns 3,056 MW of generation. In 2005, the company reported \$1.3 billion of revenue (US\$1 billion) and employed a total of 2,425 full time employees. Fuel and purchased power made up 41% of all SaskPower's operating expenses in 2005, with operations and maintenance at 28% of total expense of \$1.19 billion. About 47% of SaskPower's generation capacity is coal-fired, using Saskatchewan lignite resources. Three lignite plants – Shand, Poplar River, and Boundary Dam – are the subjects of this business value case study (see Figure 1).

younger, smaller workforce? And how do you cope with aging assets, balancing uptime and maintenance schedules without blowing the budget?

SaskPower in Saskatchewan, Canada turned to SAP Canada for solutions to this double-threat – and has emerged as a pace-setter for achieving low levels of unplanned outages.

“Utilities are looking at 50 to 60 per cent of their workforce retiring within a five to 10 year window,” says Cathy Tough, Director, Energy & Utilities SAP

Canada Inc.

“There is a lot of intellectual capital locked in those heads, and we facilitate transferring that knowledge into automated knowledge tools.”

Ten years ago, the company initiated a system replacement planning project to meet the demands of the industry. The company reengineered business processes, implemented SAP, evaluated the initial implementation, and put into action a comprehensive implementation plan for new processes at three lignite generation plants - plants that represent 65% of the operations and maintenance budget for SaskPower Power Production.

For SaskPower, they knew they were doing something right when repre-

sentatives from American utilities were coming to their facilities for seminars on maintenance.

“We are strong believers in a system, and SAP has provided a true enterprise system,” says Garner Mitchell, vice president of Power Production, the generation business unit of SaskPower.

“We know that in 20 years from now, SAP will be here. Every three years there is an update, ensuring we have state-of-the-art technology. We didn't want to buy into a system that couldn't expand or could become out-of-date in five or seven years. SAP is a growing system throughout the industry.”

The initiative has created an increase in rolling five-year average



Figure 1

equivalent availability factor (EAF) to 85.2% at a commercial value of \$50.1 million; an increase in number of work orders that can be completed using existing staff - and planned/scheduled work has increased from 50% to 80%.

“People want to be a part of a well-oiled machine, and the SAP system has changed us from performing reactive maintenance to being proactive,” says Mr. Mitchell.

“When we did a scheduled major turbine overall, we found a crack in the casing. That was great news,” says Mr. Mitchell. “Great news because we found it at the start of the maintenance schedule, and were able to take corrective action, repairing the turbine in parallel with the outage. Now, when we perform our next scheduled check on that turbine, we will be able to determine if it was a manufacturing defect or some other problem.

“Finding the crack during a scheduled maintenance check instead of just blundering through and having the unit fail saved us and our customers a lot of money.”

A routine three-week overhaul for a 300 MW plant ranges in cost from \$2.5 million to \$4 million. For a major overhaul, \$15 million to \$20 million can be spent in six to eight weeks. Unexpected outages due to failure of aging equipment can cost between \$450,000 and \$700,000 a day depending on the market price of replacement power. When critical equipment fails, the plant must be brought offline, but there is still an obligation to meet load.

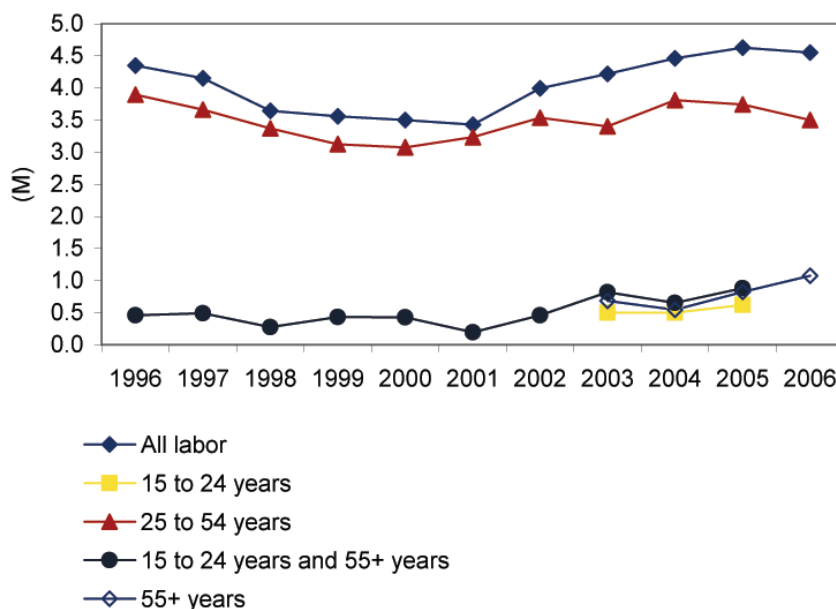
With the SAP system, plant managers can now access the cost of maintaining assets at a specific functional location over the asset life cycle.

Near-real-time availability of planned versus actual data

With millions spent on the average overhaul, timely access to data is critical to keeping projects on budget.

SAP has received widespread acceptance at SaskPower Power Production because workers at every level recognize its value and leadership supports its use and continuous training. SAP provides access to the information employees need to do their jobs and do them well.

Although SaskPower was



Source: StatCanada, 2006

Figure 2

pleased with the SAP technology, they wanted “outside eyes” to confirm that they were on the right path.

“Outside eyes see the best,” says Mr. Mitchell. “That is why the reports from all of the independent auditors and the case studies from IDC praising the work we were doing with the SAP technology gave us the encouragement we needed to stay the course.

“As a utility accountable to the citi-

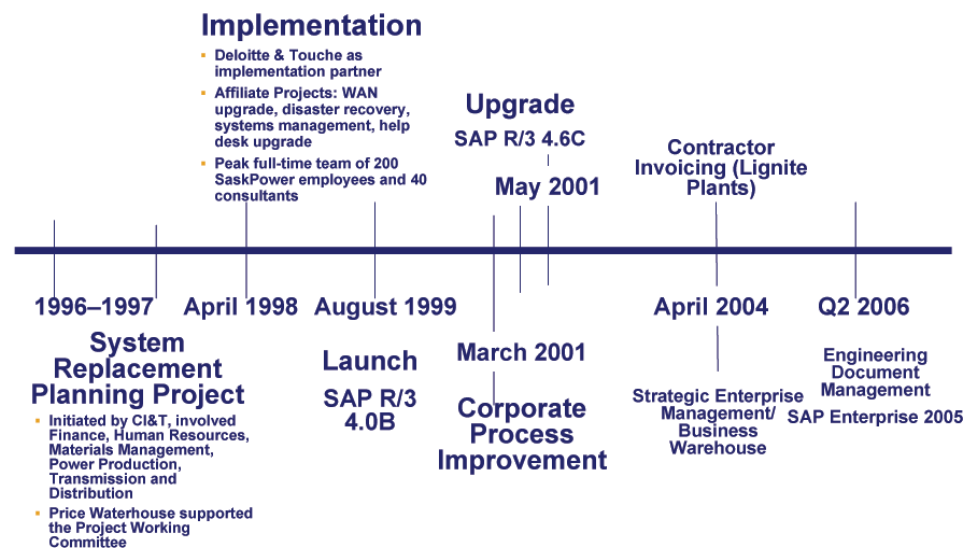
zens of Saskatchewan, we needed these independent bodies telling our customers that their money was being well spent.”

Although SaskPower is small in relation to other North American electricity utility providers, it is its generation base and relative isolation from other grids that make it a perfect example for others to study.

“Our primary source of generation comes from coal, so that garners a lot of

Continued on Page 20

Approach: Continuous Process Improvement



Source: IDC, 2006

Figure 3

SAP deployment

Continued from Page 19

interest from utilities who rely heavily on coal or natural gas.

“We had power people from Israel come over in the spring and they spent a week here. They had a 10,000 MW system and used a lot of rough coal (from South Africa) and oil for their primary generation. They took a close look at our system and they were impressed,” he says.

“Representatives from Australia, Ireland and the U.S. are interested in what we’re doing, and they are encouraged that they can do this too.”

The changing face of SaskPower’s workforce has meant transferring knowledge and skill sets from tried and true, hands-on people to younger, more computer-savvy engineers and electricians.

“A lot of our people who are retiring are taking their expertise with them, locked away in their memory or written on the back of cigarette packages,” says Mr. Mitchell. “The SAP system is an enabler, allowing us to transfer knowledge to the younger men and women who are used to computers, and they have adapted to the new SAP system readily.”

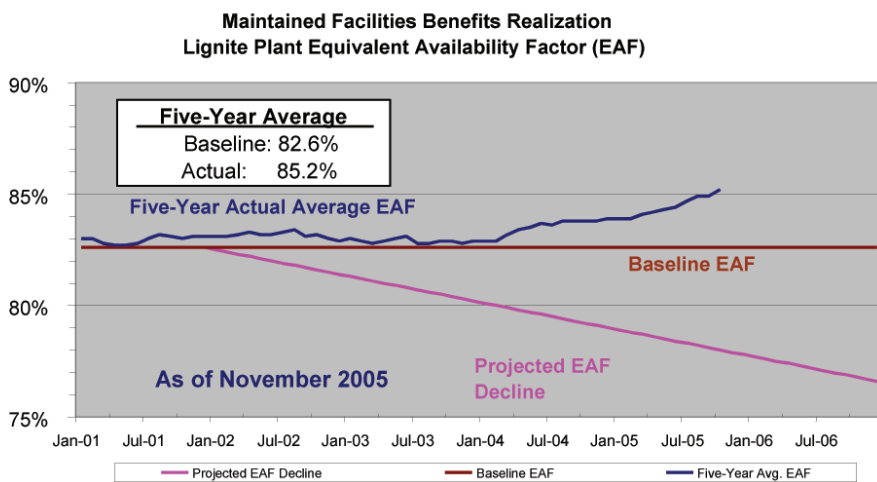
The transfer of knowledge has always been a difficult one, traditionally based on a master/apprentice relationship where younger employees would follow experienced hands around the plant, learning as they went along. Unfortunately, they would not encounter all of the duties or problems that might present themselves, and that is where the knowledge would have to be learned again.

“Basically, we’ve saved reinventing the wheel,” points out Mr. Mitchell. “The equipment histories, the condition the equipment was left in, what traditionally needs more or less maintenance... all of this knowledge that is disappearing with the retirement of the baby boomers is now available on the computer for the next generation.”

Coal-fired units at SaskPower were commissioned between 1959 and 1992. They represent nine generating units within the three plants. The use of lignite coal, which has a hard quartz base, puts extra wear and tear on equipment, resulting in higher maintenance requirements.

In addition to contributing to operations and maintenance costs, the three lignite plants make up a significant per-

Power Production Maintained Facilities Benefits Realization



Source: SaskPower, 2006

Figure 4



Source: SaskPower, 2006

Figure 5

centage of the capital investment SaskPower Power Production makes in power plants. Power Production is planning \$576.5 million in capital investment in major projects over five years, with 80% of this capital investment going to life extensions and equipment upgrades at the three lignite plants.

Figure 3 is a timeline of major milestones. Since the implementation, the company has had an opportunity to realize the benefits of this major initiative.

The increase in EAF is important because it translates into increased revenue opportunities. During times when

SaskPower has surplus capacity, that capacity can be sold to customers outside of the SaskPower service territory and delivered through transmission grid interconnections. In times of high demand, SaskPower might have to purchase power on the spot market to fulfill contract obligations. Using a benchmark price developed in the original business case without adjusting for market movement — a conservative approach — an improvement in EAF translates to accumulated benefits of \$50.1 million (US\$42.5 million). This information is displayed in Figure 5.