

Arizona Public Service

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The major event that started this case study was a catastrophic fire that destroyed five transformers at an Arizona Public Service (APS) substation. That fire impacted 400,000 customers, caused millions of dollars worth of damage, and required a rebuild of the substation.

As part of the corrective action plan that was approved by the Arizona Corporation Commission (ACC), which is an Arizona regulatory body, APS agreed to incorporate leading practices into its substation maintenance processes and to implement a scheduling tool. The goal was to increase reliability by ensuring the substations were maintained in an effective and efficient manner.

The challenges following the Westwing Substation fire provided a “burning platform,” both in a literal and figurative sense, that required APS to look at Substation Maintenance and determine the gaps between “leading practices” and current practices.

There was also a challenge because of company values. How does one incorporate change into a company with employees that have an average of 17 years of service? Or into a company that is undergoing incredible growth because Arizona is the second fastest growing area in the United States? So, in the midst of this substation crisis, the company was also having to handle more customers than ever before. To put that growth in perspective, the number of APS customers has doubled every 20 years. In 1980, APS had 400,000 customers. and in 2005 customers topped the million mark. In 2020, it is projected that APS will serve 1.6 million customers. The growth in the past ten years alone translates into 7,600 additional miles of new wire and 65 new substations. During this time, the number of APS employees has remained essentially unchanged; however, forecasts suggest that a large percentage of APS employees eligible for retirement may take that option within a few years. Therefore, like most US companies, APS is faced with an exiting work force and an emerging work force that may not be able to fill its needs.

Finally, how does one enroll Substation Maintenance employees in a Business Process Management (BPM) initiative, and, once the first part of the initiative is completed, how does one integrate continuous improvement into ongoing efforts?

To meet the challenges of increasing reliability and of becoming aligned with “leading practices,” APS brought in a “leading practices” expert and focused on documenting the “as-is” processes and capturing issues, opportunities, gaps, problems, and unanswered questions. Once the as-is processes were documented, the group focused on addressing the issues and creating a “future state” process that reflected the leading practices. The processes had Process Owners, and they attended all of the process meetings along with process teams who reflected a SIPOC (Suppliers—Input—Process—Output—Customers) perspective. The two layers of management above the section leaders also attended the sessions periodically to show support and provide the incentive from leadership. The “voice of the customer” was to reduce the number and age of the work orders and to implement a scheduling system that would support planning for five weeks out.

In addition, there is a monthly continuous improvement meeting. Currently, the focus of the meeting is to review the form that crew leaders complete to identify where the process may be improved or what worked correctly for them. The form is reviewed, and the Process Owner is responsible for addressing concerns or requests for improvement.

The methodology is the APS BPM methodology, which is largely based upon the Rummler-Brache approach. The tools are a combination of BPM best practices, Lean, and Project Management. The modeling tool is Casewise Corporate Modeler.

Implementing best practices required changes in how work was distributed and changed job duties. The leaders were exemplary in being there to support that what was being done was the “right” thing. They let people work through their problems with the changes, but reassignment for

people who were not in alignment was an option. Management provided a consistent message and culture change happened. Throughout all of this, the focus on process enabled people to envision what was needed to meet the ACC requirements and to become more proactive in their work. This picture in Figure 3 shows the Substation Maintenance Process System.

In 2007, Substation Maintenance met or exceeded all of their reliability metrics. Before the process effort, they had not met more than 80% of the metrics. Before the process effort, 80% of their work was reactive, now 20% is. They have created acceptable ranges for the number and age of work orders.

Substation Maintenance Process Owners are process aware. Periodically, the processes are reviewed to find new areas of improvement. For example, one review showed that the plan to schedule out to five weeks was not being met. The process was reviewed and changed based on input for the process team. The end result was that they are now scheduling out to 15 weeks. The biggest impacts are to

1. The department that is responsible for scheduling substation outages for Substation Maintenance, Transmission Construction, and the Lines Department because it allows for more planning and
2. The ability to have the parts ordered earlier and, therefore, available for the scheduled work.

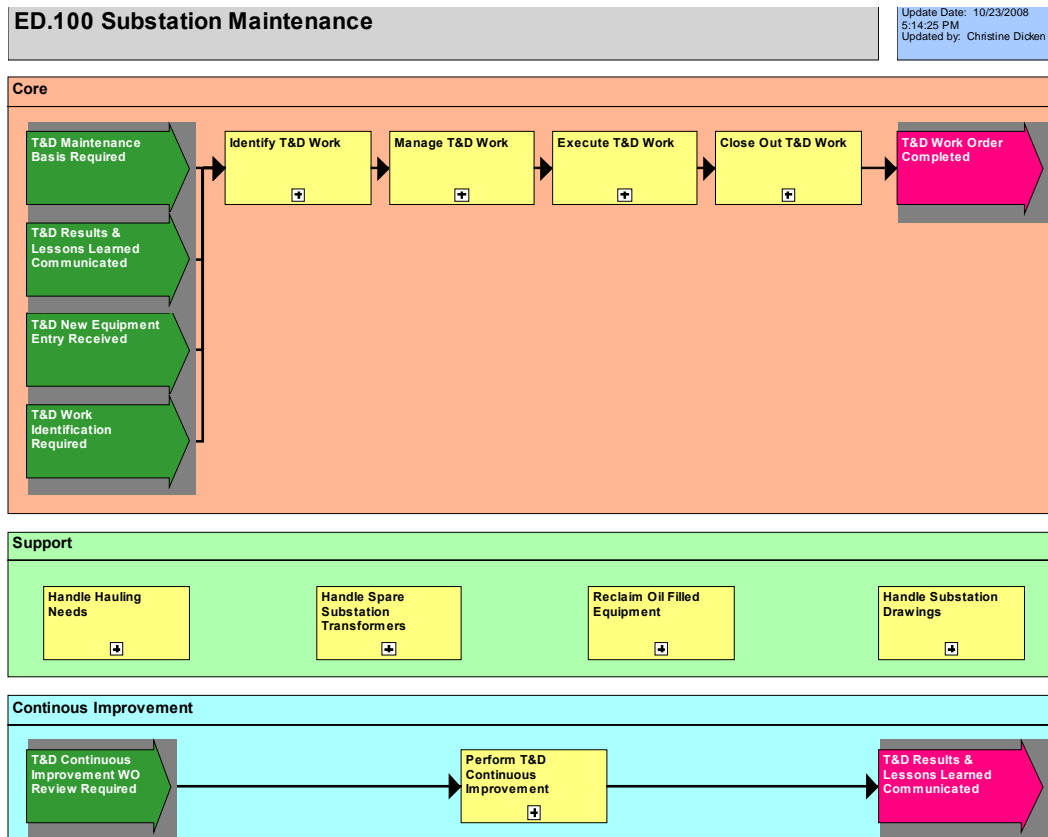


Figure 3. The Substation Maintenance Process System.

Through the end of September 2008, APS is on track to establish all-time best years in reliability measurements that track the average number of service interruptions per customer and average outage duration per customer. In fact, comparing APS' 2000 figures with 2008's projected numbers, customers are experiencing a 34% reduction in outages per customer and a 14% decrease in average outage duration per customer.

The greatest proof that the Substation Maintenance Process effort was successful is that once Substation Maintenance met the goal of operational excellence they were able to support an innovative project. That project is the Transformer Oil Analysis and Notification System (TOAN). TOAN allows APS to automatically monitor transformer oil data, receive notification of abnormalities nearly in real-time, and take necessary preventive actions. The net result is that catastrophic transformer fires may one day be a thing of the past, resulting in fewer customer outages and greater reliability. BPM methods were used to capture this highly cross-functional process, to develop new processes to implement and monitor the vast amount of data that is gathered, and to resolve the issues with implementation. This cross-functional process goes across a number of departments: I/S (Information Services) Communications, I/S Construction & Maintenance Systems, Substation Maintenance, Transmission Construction Projects, and the Reliability and Management Department. BPM allowed these team members to have a facilitated conversation about what was needed to implement TOAN and a systematic way of resolving issues. The TOAN Process System overview is pictured in Figure 4.

The TOAN project earned APS the 2008 Edison Award – the electric utility industry's highest honor – for its innovation and operational excellence. TOAN was also a contributing factor for APS' Information Services being named in the 2008 edition of the InformationWeek 500 as the No. 1 energy utility for information technology (IT) innovation. APS also ranked among the top 10 overall U.S. companies and highest among those based in Arizona.

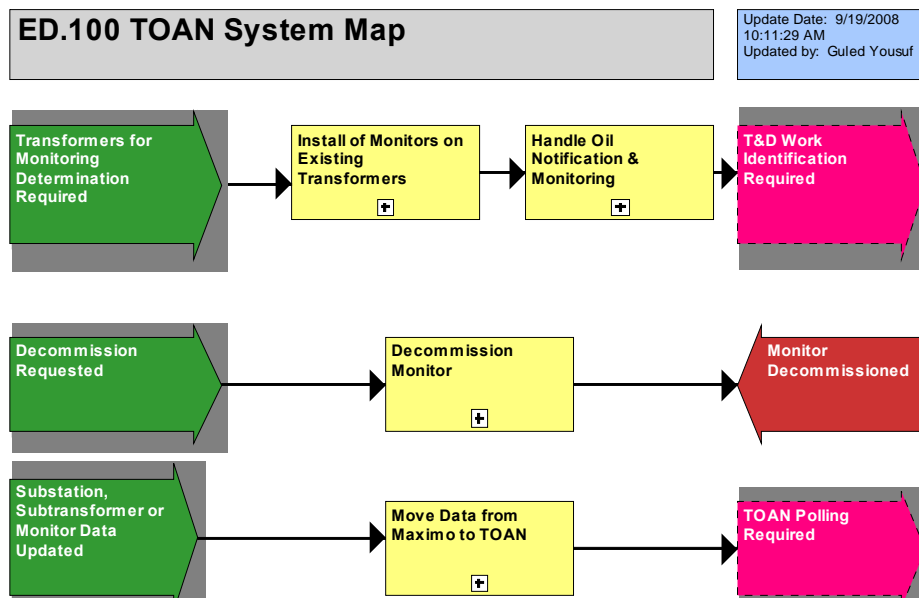


Figure 4. The TOAN Process System overview.

Actions speak loudest. And sponsorship speaks volumes for the success in progress in creating APS as a process-based organization.

The Substation Maintenance and the TOAN staff review their processes every nine to twelve months to detect areas for improvement or to update the process documentation so that it can be used for Knowledge Management and APS BPM methodology.

The successes of the Substation Maintenance Improvement Project and TOAN resulted in the Vice President for Energy Delivery starting an initiative in 2008 for Standardized, Optimization, Automation, and Reporting (SOAR). The purpose of the multi-year initiative, which is process-based, is to assess processes, procedures, technologies, capabilities, and organizational and operational effectiveness and performance to identify areas for improvement. The cross-functional areas in the initiative included Asset Management, System Planning, System Operation, Design and Engineering Construction, Project Management and Standards, Design and Configuration Management.

In early 2008, a “franchise” of CPE certified BPM facilitators was established to meet the process needs of Palo Verde Nuclear Plant.

There is also an I/S initiative for Business Process Transformation with the CIO stating, “Business process optimization will soon become I/S’ most strategic offering.”

Currently, the APS Center for Process Excellence (CPE), a corporate BPM group that provides process expertise, is involved in most major projects and has customers advocating for “process first.” Yet, most of CPE’s work is by referral or repeat business and, since CPE acts on a consultant basis, the services are charged back to customers.

The modeling standards are currently being examined for the adoption of BPMN (Business Process Modeling Notation) as a step to standardize in preparation for a BPMS (Business Process Management Suite).

BPM is seven years old at APS. There was an IS Project to capture and improve IS processes in 2002 that led to the establishment of the Center for Process Excellence. It is common knowledge that many BPM or continuous improvement efforts do not survive. This case study is the story of building on the BPM successes to integrate process thinking at APS.

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