STREAMLINING THE METEOROLOGICAL MONITORING PROCESS

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Background

TVA's Total Quality Initiative makes use of functional and task teams to address problems using a six step problem solving process. The steps include reason for improvement, problem definition, analysis, solutions, results, and process improvement. Functional quality improvement teams are voluntary teams aimed at improving business practices in a specific functional area. Task quality improvement teams are appointed by management to address a specific problem area. Experience has shown that not all problems warrant rigorous and formal application of the six-step process. In these cases, an informal team uses the most appropriate portions of the six-step process to address the problem. Streamlining of the meteorological monitoring process for TVA nuclear plants was determined to be one of these situations.

Reason for Improvement

The meteorological monitoring program at TVA has been performed by the Resource Group (RG) organization for the TVA Nuclear (TVAN) group. The budget was reduced by 13% from fiscal year 1995 to 1996 and another at least 5% cut was planned for fiscal year 1997. However, the RG was asked to perform the same level of support with the reduced funding. This necessitated implementing process improvement to reduce costs and increase efficiency. Therefore, RG management appointed an informal task team to:

1. Examine the meteorological monitoring process,

2. Identify improvements and changes that could be made while continuing to meet customer requirements, and

3. Provide justification for the budget needed to meet the requirements.

The team was made up of thirteen members including a team leader, team advisor, members from each of TVA's nuclear plants and corporate group, and seven members from various support groups in the RG. The team chose to be called the Nuclear Meteorological Monitoring Informal Task Team, or NuMMITT.

Problem Definition

The method for problem definition depends on whether the work is cost-driven or process-driven. The team decided that meteorological monitoring is process-driven. Therefore, the first activity was to flowchart the process. The process was divided into six subprocesses. These were based on RG organizations and included Field Engineering (i.e., sensor exchange and preventive maintenance), Instrumentation (i.e., sensor calibration), Engineering Data Services (i.e., data validation), Information Services (i.e., computer support), Quality Assurance (i.e., document control), and Atmospheric Sciences (i.e., ODCM support). Since this process is also driven strongly by regulatory requirements, the requirements associated with each subprocess were identified. Those activities that are not process-driven, such as administrative, training, and some quality assurance activities were not included. Therefore, about 70% of the meteorological monitoring work was included in the flowcharts.

After the team completed the flowcharts, each step was included in an activity list by organization. The team member from each organization identified a range of time for each step for time spent waiting before the step could be performed and for time to perform the step. The member also identified whether there was a handoff to someone else after completion of the step. The final action involving the activity list was to perform a value analysis of each step. This identified whether the step is definite or suspect. Criteria used to make this decision included how critical the step is to the customer and what the significance would be if it were left out. Input from the TVAN customers was very important in making this determination as was the requirements that might be impacted by the various steps. An example of a completed activity list is provided in Table 1. Completion of the flowcharts and value analysis identified about 950 process steps. Of these, about 22% were classified as suspect. However, further examination of suspect steps is needed to decide their disposition.

Analysis

Review of the wait times from the activity lists indicated that cycle time was not a problem. Verification of the requirements indicated that there were no basic changes in what was required. The root cause of the problem was determined to be that TVAN can only be competitive by continuously cutting costs; however, all regulatory requirements must be met for continued plant operation. A total of 24 action items were created to examine the suspect steps and to decide how to streamline the process.

Solutions

Table 2 summarizes the action items that were identified by the task team and the status. Implementation of the action items was impacted by two other events which occurred while the team was meeting. First, a problem evaluation report (PER) was initiated as a result of a TVAN QA audit of RG. It stated that TVAN was not providing sufficient guidance and oversight of RG's support to TVAN. Several interim corrective actions were implemented including use of work

orders for onsite work and onsite review of RG procedures. Second, budget negotiations for fiscal year 1998 led to evaluation of moving some of the RG support directly to TVAN. The Information Services support is being moved and the instrument mechanic support will likely be moved. Although these events had a significant impact on the process the team was trying to streamline, the decision was made to continue meeting. This permitted NuMMITT to provide significant input to the resolution of these events. For example, the activity list and range of time required to perform the work prepared by NuMMITT were critical in the budget negotiation process. This information better enabled RG to determine a "bottom line" funding level.

Summary

The informal task team formed by TVA to streamline the meteorological monitoring process has been functioning for about a year. It has met eleven times in person or by videoconference. Average attendance by members has been 85%. It's success has led to formation of a standing committee made up of many current team members as a permanent corrective action to the identified PER. This committee will approve procedures, provide configuration management of the monitoring components, and will approve any modifications to the system and process.

The RG budget for fiscal year 1998 will show at least a 25% reduction from fiscal year 1997. Without the work of NuMMITT, continued compliance with requirements at the reduced level would not have been possible. The team will continue to track improvements and cost benefits and revise the process flowcharts accordingly. The team will also seek to share its success with others who may benefit from this streamlining example.

TABLE 1 - ACTIVITY LIST FOR TEMPERATURE SENSOR CERTIFICATION

Instrumentation		Wait Time			Process Time (hrs)		Handoff,
RTD CERTIFICATION (ES-11.26)		Minimum	Maximum	Value	Minimum	Maximum	Rework, Other
	START						
IN-A01	*Receive sensors (from FE-F06/F22)*			D	0.25	0.5	
IN-A02	Log into inventory			D	0.25	0.5	
IN-A03	Ship replacement sensors from stock			D	0.5	1	**Handoff** • **FE-B03** • **FE-B05**
IN-A04	**Standard up-to-date? [to IN-B05, IN-B06]**			D	0.25	0.5	
IN-A05	**CERTIFY STANDARD**			D			
IN-A06	Perform sensors "as-found" calibration (0° C)			D	0.5	1	
IN-A07	Perform sensors "as-found" calibration (40° C)			D	0.5	1	
IN-A08	Perform sensors "as-found" calibration (100° C)			D	0.5	1	
IN-A09	**Within specifications ? [to IN-B10, IN-B11]**			D			
IN-A10	Redo			D			
IN-A11	Set "as-left" equal to "as-found"			D	0.25	0.25	
IN-A12	Complete Documentation			D	0.5	1	
IN-A13	Engineer review			D	0.5	1	
IN-A14	Return to stock			D	0.25	0.25	
IN-A15	Send document to QA Records			D	0.25	0.25	Document • DS-A05
	STOP						

TABLE 2 - ACTIONS TO STREAMLINE METEOROLOGICAL MONITORING PROCESS

Task	Status
Simplify plant calibration of signals sent.	Plants have not implemented.
Automatically update plant access for instrument mechanics.	Plant did not want to pursue at this time.
Clarify single point dew point calibration.	Implemented.
Deleted redundant weekly checklist items.	Implemented.
Clarify notification of outages.	Completed.
Add missing step in RTD exchange.	Implemented.
Clarify review approval on forms.	Revised to reflect plant requirement of reviewer being qualified to perform the work.
Determine if site inspections should be performed by TVAN.	Left in RG.
Consider putting RG procedures in plant procedure maintenance program.	Implement at later date.
Decide whether to continue use of strip charts.	Not necessary but continue until they wear out. Discontinue archiving of charts.
Examine if shelf life for DVMs can be lengthened.	Keep as is.
Evaluate removal of dew point sensors.	Keep at two plants for cooling tower operation and charcoal filter heater backup. Remove other.
Evaluate lengthening sensor exchange intervals and computer calibrations from 6 to 12 months.	Under evaluation.
Evaluate replacement of wind speed, wind direction, DVM and rainfall sensors.	Sonic anemometer and rain gages under evaluation.
Evaluate oil change and maintenance interval for propane generators.	Revised to be annual instead of six months.
Evaluate feasibility of electric current check for tower lights.	Kept as is.
Evaluate method for azimuth alignment.	Tested use of digital compasses but not accurate enough. Kept as is.
Evaluate calibration interval for wind direction calibrator certification.	Keep at two years.
Evaluate removal of trouble shooting equipment from M&TE.	Kept as is.
Replace system modification request process	Software support being switched from IS to TVAN. Will use their preestablished software revision process.
Evaluate separating data acquisition and data formatting functions to facilitate easier dissemination of data to users.	Have not done yet.
Upgrade spreadsheet used for data validation.	Have not done yet.
Evaluate alternative means of data archival.	Have not done yet.
Stop continuous operation of onsite printer.	Waiting FSAR change.