



USDA's National Finance Center: A 10-Month Journey to Level 2

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The National Finance Center (NFC), an agency of the U.S. Department of Agriculture (USDA), has been honored for excellence in information technology. Government Computer News recognized NFC in March for its accomplishments in implementing the necessary software process improvements that are required to achieve Level 2 of the Software Engineering Institute's Capability Maturity Model (CMM) for software. NFC's efforts placed it among the top 30 percent of all federal organizations assessed under the CMM since 1986. This article describes the work that led to the Level 2 certification and provides insight into some of the successes, challenges, and lessons encountered along the way. The center is under the direction of John Ortego.

Preparations

The NFC performs the record keeping and software development functions for the Federal Retirement Thrift Investment Board. Under Congress' direction, the board oversees the administration and operation of the Thrift Savings Plan, the 401K-like component of the federal retirement system. The NFC's CMM efforts were centered in its Thrift Savings Plan Division (TSPD) directed by Roderick Keith.

The board became interested in the CMM in early 1995. There was an initial assessment in August 1995, followed by an interim Software Capability Evaluation (SCE) in March 1997. TSPD enlisted the help of the Software Technology Support Center (STSC) later that year to assist with strategic planning, to develop and present software process improvement workshops, and to provide specific consulting in software process improvement and preparations for CMM assessments. Charles Stensrud, former NFC computer specialist program analyst, formed the TSPD Software Engineering Process Group (SEPG) and began to document the organization's software processes with respect to the CMM key process areas and identify improvement areas, training needs, and training sources.

A 10-Month Journey

NFC's journey commenced as efforts began in earnest in November 1997 with the organization of and subsequent roll-out of several key processes. The processes included requirements management, project planning, tracking and oversight, and software quality assurance (SQA). In early 1998, the software configuration management (SCM) process was rolled out. Specific process action teams (PATs) researched the processes, which were developed and authorized by the SEPG and the Management Steering Group (MSG). The STSC presented a series of software project management workshops to personnel who were directly affected by and contributed to the new processes. The workshops were specifically tailored to the processes and included theoretical instruction in project management techniques, software tool use, and exercises in implementing the processes. The STSC continued to provide consulting services to TSPD, including document and process review, MSG

support, analysis of data and results, and additional assessment preparation activities.

In March 1998, TSPD underwent a "CMM gap analysis" assessment. The results indicated a maturity level for the organization below Level 2 and that additional work was required prior to the external assessment planned for September 1998. Linda Giffin, NFC systems accountant, led several of the PATs and was responsible for the development of several of the key project planning, estimation, and management processes.

The gap analysis "was an extremely positive, extremely painful experience," Giffin remarked, but they "thought they had made it." She concluded that although the organization was extremely disappointed with the results, it seemed to energize their resolve and vigor to improve before the September assessment. TSPD continued to gather data from their processes and to improve and institutionalize them. In the first part of September, an external assessment was performed, and on Sept. 18, 1998, TSPD was officially certified CMM Level 2. NFC's future plans are to maintain the Level 2 rating in TSPD, transition the processes and success to the other divisions of NFC, and expand efforts toward Level 3 certification.

Roderick Keith has been reassigned and is director of the NFC's Application Systems Division (ASD) and has asked Giffin and Stensrud to lead the ASD effort to achieve CMM Level 2.

Challenges and Successes

A number of challenges were encountered and overcome by TSPD in its journey to Level 2. Perhaps the strongest challenge was to manage the culture of the division in such a way as to improve the chances of success. As the CMM initiatives began, personal heroics were responsible for much of the division's success. There also was a strong sense of "things are always done this way," and a few skeptics seemed to always be present to predict the failure of any new idea. Another challenge was the time frame allotted to achieve Level 2. The board had directed that future funding for TSPD would be based on a successful Level 2 certification by September 1998.

TSPD responded to these challenges by gaining early man-

agement support for its CMM initiatives. TSPD established strong, opinionated champions throughout each level of management that ensured that the vigor of change would not be lost. The SEPG and MSG worked together to develop policies and processes and to strategically plan the steps toward successful achievement of Level 2. Skepticism was managed, successes were readily communicated, and feedback mechanisms were put in place, so everyone associated with the effort understood the plans, processes, and goals of the journey. The STSC's expertise was used to train personnel to operate in a Level 2 environment and to guide the MSG and SEPG in collecting and interpreting results and maintaining the course. In the end, the organization's culture had been managed, the changes had been successfully implemented, and the skeptics silenced—some of them becoming the most successful implementers of the new processes and ideas.

TSPD has some advice for those who find themselves struggling toward Level 2 and for those who may have just made it:

- Use SQA to your advantage. TSPD established an SQA team early on and appointed it to provide the monitoring function to meet the Level 2 goals.
- Keep management actively moving in the different processes. The effort must maintain its vigor to succeed, and management is uniquely qualified to ensure that it happens.
- Use both industry and the organization's expertise to its full

extent. If needed, acquire any additional expertise needed to meet objectives. ♦

About the Author



A. Todd Steadman is a software development engineer for TRW Avionics Systems Division. He has provided software engineering technical services to the STSC for eight years. His efforts for the STSC have focused on software project management technology, including technology research, evaluation, and tool insertion in various Department of Defense and other federal government organizations. His contributions have included *CROSSTALK* articles and project management and cost estimation technology reports produced and distributed by the STSC. He has a master's of science degree in computer science from Utah State University and a bachelor's degree in electrical engineering from the University of Utah.

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FMSO Achieves CMM Level 4

The Navy Fleet Material Support Office (FMSO) has been rated a Capability Maturity Model Level 4 organization. They were assessed Oct. 5-9, 1998 under the CMM-Based Appraisal for Internal Process Improvement (CBA-IPI).

FMSO provides information technology products and services to the Navy, Department of Defense, and other federal activities, with particular emphasis on systems that support Naval supply, inventory and material management, financial processing, and maintenance operations.

FMSO is located on the Naval Inventory Control Point complex in Mechanicsburg, Pa. It serves as the Central Design Agency for software support in the Naval Supply Systems Command.

FMSO is the first Navy activity to achieve a CMM Level 4 rating. This cer-

tifies that FMSO has the ability, commitment, and established procedures to fully satisfy the CMM requirements of a Level 4 organization and is performing based on FMSO's defined processes.

FMSO has gone from a work force of more than 1,410 employees in 1990 to a little more than 880 in 1998. Faced with personnel reductions and retirements, the organization had to capture the "corporate knowledge base" and learn to capitalize on the organization's strengths. Top-level management support helped improve areas of weakness.

The first assessment (October 1992) yielded a CMM Level 1 rating. Three years later, FMSO achieved a Level 3 rating. As a CMM Level 4 organization, they look forward to the challenge of expanding their use of new technology in software development, while stepping up to attain a Level 5 on the next assessment.

FMSO's goal is to provide the integrated solutions necessary to support the complex business changes its customers need. FMSO's success is directly related to its ability to perform predictably, yet do more with less.

The assessment team consisted of Kathy Chastain, Joe Bobby, Ron Doyle, Skip McGowan, Deb Yorlets, and Dave Shupe of FMSO, along with John Smith, Ann Roberts, and Felecia Hensley of Dayton Aerospace, Inc.

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