

# Sandia undertakes new initiative to improve way software is developed at Labs

*Initiative follows Software Engineering Institute's Capability Maturity Model*

By Chris Burroughs

You can't feel it, see it, or touch it, but by leaps and bounds it is becoming a dominant force in our lives.

"It" is software that is found in everything from personal computers to complex military systems.

Because of this growing reliance on software and demands that it be fail-proof — particularly in critical areas such as weapons — Sandia has undertaken a new initiative to improve the way software is developed at the Labs.

Called the Software Improvement Initiative, it uses the Software Engineering Institute's (SEI) Capability Maturity Model (CMM) to give software-intensive organizations a path to improve — changing from an ad hoc, immature process of developing software to a mature, disciplined one.

"As we rely more and more on software, it becomes increasingly important for it to be developed following logical processes that can be retraced," says Ron Detry, Director of Nuclear Weapons Programs Integration and Studies Center 9800 and long-time quality processes champion. "CMM gives you some assurance that your software will work because you are following a logical way of development that has proven successful in the past."

A CMM appraisal results in five possible levels of software development maturity. The lowest is level 1, where the process is unpredictable and poorly controlled. The highest is level 5, where the process has been measured and controlled and is in a continuing improvement stage. Specific key processes must be followed to achieve each level.

Several Sandia centers have started on their CMM journey, Ron says. One reason is that it is seen as a way to improve software development



**CMM PLANNING** — Members of an Information Systems Development Center 9500 technical working group that is integrating current software process development systems with Capability Maturity Model (CMM) meet. They are, from left, Joe Schofield (9510), Lillian Ingham-Hill (9519), Scott Joyce (9522), and Larry Arellano (9511).

**Software Improvement Initiative Web site:**  
<http://www-irn.sandia.gov/cmm>

organizations and assess their software development methods. Working with Mike and his department members were representatives of SEI and cooperative research and development agreement (CRADA) partner SEMATECH, a consortium of major semiconductor manufacturers.

## Feet wet with SEMATECH

Dave Peercy, Dwayne Knirk, Patty Trelue, and

Sandia has opted to perform self-assessments, using Mike's group as the assessors. If DoD, DOE, or Lockheed Martin mandate CMM, the Labs would have to bring in official assessors certified by SEI.

## Requirements

The big difference, says Jim Rice, Director of Information Systems Engineering Center 6500, is that CMM operates in a pass/fail mode — if an organization doesn't meet every requirement of a level, it remains at the lower level. Using Mike's grading method, which assigns numerical ratings in each area being assessed, the organizations know exactly where their strengths and weaknesses are.

Interestingly, the Information Systems Engineering Center 6500 and the Information Systems Development Center 9500 fell short in exactly the same two process areas — software quality assurance, a level 2 requirement, and peer review, a level 3 requirement.

Paul Merillat, Director of Center 9500, has a theory about why this is so.

"It deals with the level of trust Sandians have toward each other," he says. "Sandia culture says 'I trust you to do good work.' Thus, they don't see a need for peer reviews — reviewing someone else's work — or quality assurance reviews, verifying that the required work products were actually generated."

Both Paul and Jim say that following the CMM system makes life easier for people involved in software development.

"In the past software development has been hero-based," Paul says. "People would come and devote 11 hours a day to solve a problem and get it right. Then they get burned out. Not only is this expensive, but it's costly."