



Space and Intelligence Systems employees Bruce Tomei (from left), Jonathan Fish, Steve Sichi, and Ying Feria plot Critical Chain Project Management strategy.
SALLY ARISTEI PHOTO

Keep the chain intact

S&IS speeds work on complex programs

By JOEL R. NELSON

The fact that Boeing Space and Intelligence Systems is progressing steadily on one of its commercial satellite programs is not unusual. What's noteworthy is the program's use of a progressive approach to managing projects.

That approach is Critical Chain Project Management, and it's having a measurable impact at the S&IS satellite manufacturing facility in El Segundo, Calif. On one program the approach cut by almost 60 percent the time needed to complete the front-end system design.

CCPM addresses the organizational forces and natural human tendencies that conspire to delay projects, making it especially useful for managing the complexity inherent in designing and building advanced satellite communication systems.

"We knew from the outset, given the scope and complexity of this system,

that we had to adopt a new approach to planning and managing our day-to-day execution or we were not going to be successful," said Bruce Tomei, manager of the program's System Engineering and Integration team.

The CCPM approach recognizes that uncertainty and competition for resources are inevitable; it provides three fundamental rules for managing their effects:

- Limit the amount of work in process. Stagger and control the release of work to prevent multitasking; prioritize tasks; don't start work unless it can be completed without interruption; finish tasks before starting new ones.

- Create a buffered schedule. Remove excess time in conservative estimates of task durations; aggregate this time at the overall project level for all task owners to draw upon when necessary; focus individuals on working to aggressive schedules; adopt a relay race mentality of handing off tasks as quickly as possible.

- Manage daily execution to global metrics. Monitor the remaining duration of critical tasks and the consumption of proj-

ect-level buffers; shift resources from non-critical tasks to critical ones; implement buffer recovery procedures when warranted.

On the commercial satellite program, "We made a commitment to adopt CCPM as our new operating mode, and this decision really paid off by helping us identify and focus on the most important tasks at any given time," Tomei said. "We improved our overall situational awareness, streamlined our task-to-task handoffs, and accelerated the flow of work."

The result: The team is on track to complete the system design phase in 15 months, compared to the 36 months it took on a similar program.

"We proved that if you invest the time to build a solid precedence network and identify and address fundamental behavior changes that are required, CCPM can be applied in an engineering design and development environment characterized by complex product requirements, high uncertainty, numerous iterations and complex interactions," Tomei said.

"Bruce and his team have delivered time-saving and cost-saving results by implementing CCPM on upfront design and engineering processes," said Marshall Short, director of Engineering for S&IS. "Each day at the beginning of a program is just as important as a day near the end of a program, and I applaud this team for using innovative methods to give visibility to critical chain tasks very early in the life cycle." ■

Assembling the chain

Here are the key steps in Critical Chain Project Management.

- 1. Build a quality precedence network.** Thinking through the steps to achieve a desired output offers benefits such as identifying opportunities for improvement.
- 2. Focus on mindset and behavior changes.** This helps instill a sense of urgency and engrain a "relay race" mentality.
- 3. Establish new processes.** This ensures that people are working in a coordinated manner and are focused on the right priorities.
- 4. Provide an open environment.** This removes the stigma that can come with seeking help.
- 5. Utilize a tool to manage complexity.** It's not easy to identify the critical tasks in a complicated network.