The Dec. 1 Space Quality Improvement Council (SQIC) meeting will provide a foundation for many of the subjects that will be presented at the following day’s Mission Assurance Summit in Reston, VA. It will update the SQIC membership on ongoing areas of interest. Attendees can anticipate the following highlights at the SQIC:

**AEROSPACE TECHNICAL HANDBOOKS – AN UPDATE** — In support of the Space and Missile Systems Center, The Aerospace Corporation is producing a series of process handbooks to guide MA practitioners and program managers. Titles include “Mission Assurance Guide,” “Test and Evaluation Handbook,” “Acquisition Risk Tailoring,” a revision to...
LESSONS LEARNED
Clementine and NEAR – Learning from Others’ Experiences

The Clementine mission prematurely ended in 1994 after excessive thruster firing depleted its fuel. Engineers on the Near Earth Asteroid Rendezvous (NEAR) mission picked up a key lesson from the Clementine failure, thereby saving the NEAR mission later on. More information on this excellent example of lesson learning is available online at klabs.org/mapld04/tutorials/mishaps/presentations/6_near_sue_lee.ppt.

BACKGROUND
The Clementine spacecraft successfully circled the moon and demonstrated many technologies. Soon after, however, a maneuver triggered a numeric overflow in the processor, causing it to erroneously fire its thrusters and freeze. A “watchdog timer” algorithm should have cut off the thrusters, but it could not execute because the computer had already crashed. By the time ground operators regained control, all the fuel was gone. Engineers on NEAR studied the Clementine mission and realized that a hardwired timer would have stopped thruster firing, and so they implemented this safety feature. Three years after NEAR’s 1996 launch, an engine burn aborted, and the flight computer lost control for 27 hours. During the emergency, the spacecraft fired its thrusters thousands of times. Fortunately, the thrusters had been hardwired to fire only for fractions of a second each time, and thus the fuel loss was tolerable. NEAR was saved.

LESSON LEARNED
• Apply independent fault protection, such as hardware watchdogs, to mitigate software risks.

DOD Issues Acquisition Roadmap

In line with Defense Secretary Robert Gates’ recently announced efforts to pursue a wide-ranging efficiencies initiative, the Department of Defense issued an acquisition guidance roadmap Sept. 14 along with memoranda seeking to trim costs significantly without sacrificing mission assurance while maintaining or boosting the industrial base skill set and its stability.

Among the highlights of the “Better Buying Power” program (see also the page 1 SQIC article): incentivize productivity and innovation in industry; promote real competition; improve craft services acquisition; and reduce nonproductive processes and bureaucracy. This major undertaking could impact MA and will require additional vigilance on the part of project managers to maintain and improve MA efforts.

The new goal is to obtain 2 to 3 percent net annual growth in warfighting capabilities without commensurate budget increases by identifying and eliminating unproductive or low-value-added overhead, and to transfer those savings to warfighting capability — in other words, “Do more without more.” Effective immediately, for example, Under Secretary Ashton Carter is requiring services contracts valued at more than $1 billion to contain provisions to achieve productivity improvements and cost efficiencies throughout the contract period.

Among the objectives are to deliver the warfighting capability we need for the dollars we have; get better buying power for the warfighter and taxpayer; restore affordability to defense goods and services; improve defense in-

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JMAC and the Search for Common National Space Specs and Standards

The main thrust of the Joint Mission Assurance Council (JMAC) in 2010 has been to develop national space specifications and standards (NS S&S) for use by all four of its member organizations. The JMAC is a collaborative government forum of senior mission assurance representatives from the Space and Missile Systems Center (SMC), the National Reconnaissance Office (NRO), the National Aeronautics and Space Administration (NASA), and the Missile Defense Agency (MDA). It is facilitated by The Aerospace Corporation in order to address MA challenges common to all four of these organizations.

The JMAC was established in 2008 and is currently led by Col. David Swanson, SMC chief engineer, in close cooperation with counterparts from the NRO (Dr. Tom Burns and Byron Knight), NASA (Dr. John Lyver and Dr. Michael Stamatelatos) and MDA (Karen Cushenberry and Pat Dennis).

The council meets several times a year and is the working group behind efforts to implement actions arising from senior leader forums such as the Mission Assurance Summit and the Space Quality Improvement Council (SQIC). During the acquisition reform era of the late 1990s, military specifications and standards were canceled, and acquisition contracts were written without imposing these government documents that codified years of lessons learned and best practices. After experiencing a series of mission failures, which resulted from poor practices and lack of government oversight, the government instituted a “back to basics” approach, which included the reinstatement of specifications and standards. Along the journey to reinstate solid technical practices, the initial collaboration among the four space agencies only loosely shared standards or looked for commonality. The differences are believed to have resulted in higher costs, because contractors were forced to maintain and follow multiple versions of their command media in order to comply with contracts from multiple government customers.

To address this situation, the JMAC is working to jointly develop and maintain NS S&S documents and implement them on all new contracts. Several options have been identified as means by which consistent NS S&S could be developed and maintained:
1) an existing agency standard is used by all four JMAC member organizations, or
2) an NS S&S specification is jointly developed and maintained by all the JMAC agencies, or
3) the JMAC agrees to use a single military or industry

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“DOD HDBK 340” (dealing with the application of MIL-STD-1540), “Payload Interfaces,” “Information Assurance Handbook,” and “Ground Mission Operations.” Other titles might be added during the presentation.

STANDARDS UPDATE – ENVIRONMENTAL TESTING FOCUS — This will be a brief update on the latest standards and an opportunity to assess the industry and governmental consensus on those standards, with an emphasis on recent investigations into selected MIL-STD-1540 environmental testing requirements.

PANEL DISCUSSION – PROGRAM MANAGEMENT AND MA ENGAGEMENT — An industry panel will provide perspectives on the role of MA and its place as a line management’s imperatives (typically performance, cost, and schedule). The panel and a brief period of discussion will provide an insight into the challenges of “baking in” MA. This area will complement topics at the MA Summit on “Developing the Workforce to Effectively Implement Proven MA Practices” to the extent that it includes insight into management roles on “Mission Assurance Tailoring: Guiding Project Managers Through the Tradespace.”

NATIONAL SECURITY SPACE ADVISORY FORUM (NSSAF) EARLY ALERT UPDATE AND NONDISCLOSURE AGREEMENTS (NDAS) — The NSSAF Early Alert requirements and architecture modifications currently underway are planned to be integrated with developing information technology (IT) resources for mission assurance to provide enhanced failure traceability and notification. The SQIC membership should anticipate an overview to include Early Alert system usage and content enhancements that are aimed at providing utilities such as Aerospace design advisories, technical best practice documents, and industry lessons. Participants in the NSSAF Early Alert process will be expected to have updated their nondisclosure documents.

ROUNDTABLE DISCUSSION — Taking a cue from the considerable guidance and policy documentation recently issued for government acquisitions, the SQIC roundtable topic will be “What steps are you taking to respond to recent government productivity and efficiency initiatives, and what are the likely impacts/results?” Consistent with Defense Secretary Robert Gates’ efficiency initiative and Under Secretary Ashton Carter’s memorandum on “Better Buying Power: Mandate for Restoring Affordability and Productivity in Defense Spending” (see related article, page 2), this topic will elicit industry’s responses and provide a forum for sharing perspectives.

During the outbrief, the message to government seniors will articulate how industry is interpreting and responding to government direction, with comments on anticipated results, benefits, and impacts.

For more information about the SQIC, contact Les DeLong at 310-336-5055.
To incentivize the industry, the DOD is proposing to leverage competition (vs. directed buys); use proper contract types for development and procurement (phase out award fee contracts and favor fixed-price or cost-type contracts in which the government and industry share equally in overruns and underruns); align policy on profit and fee to circumstance; share the benefits of cash flow; target nonvalue-added costs; involve small business; and reward excellent suppliers.

Other areas of MA collaboration in work by the JMAC include the development of subcontract management standards, establishment of a government “clearinghouse” for performing and sharing data from government audits of contractors, and development of a collaborative approach for combating the increasingly vexing problem of counterfeit parts in the supply chain.

The JMAC also is engaged in other MA collaboration forums such as the SQIC and the Space Supplier Council as the government action agency for MA improvement initiatives.

For additional information on the JMAC, contact Frank Knight, 310-336-5484.