

# The Reliability Analysis Center

## A Program Manager's Resource

NED CRISCIMAGNA

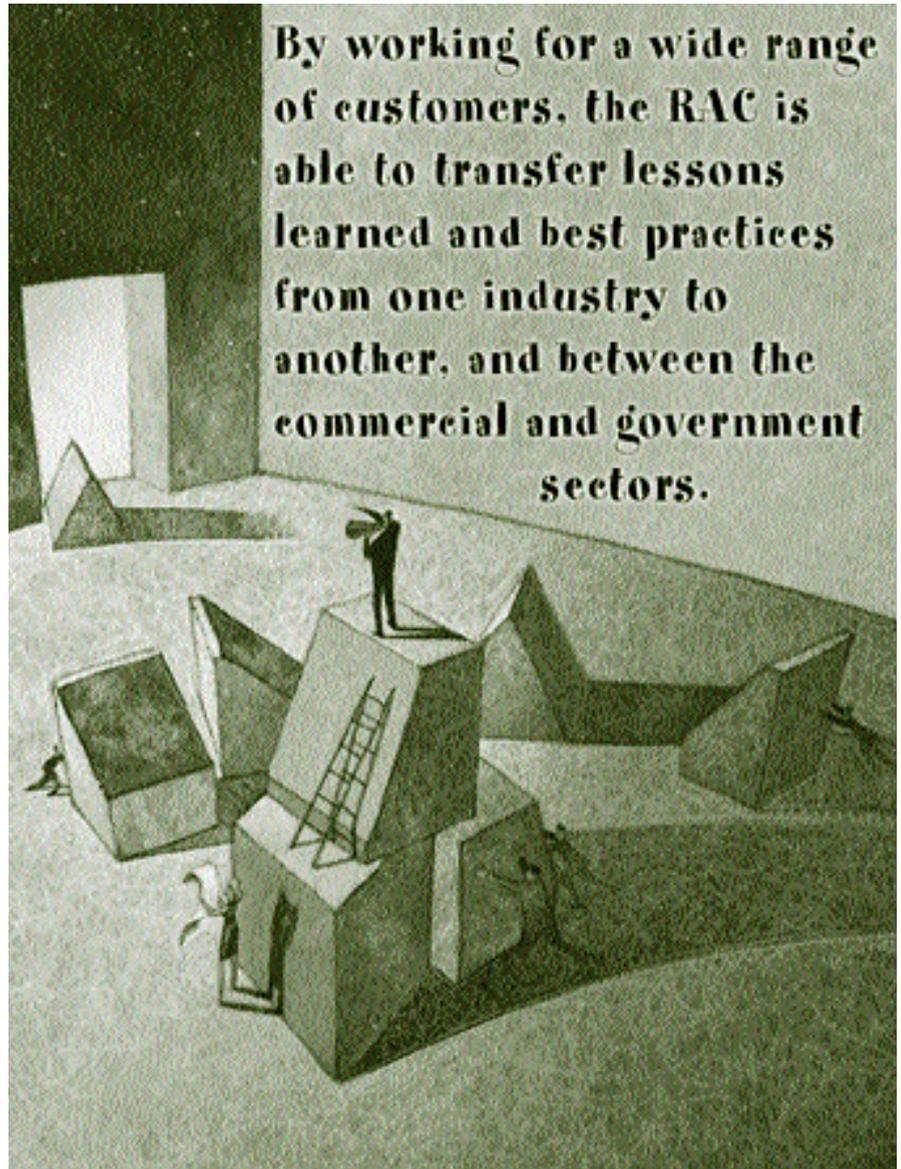
**T**he Reliability Analysis Center (RAC) provides reliability, maintainability, quality, and supportability (RMQS) resources and services to program managers, the Department of Defense, the military services, other government agencies, and industry. The RAC is one of 13 Information Analysis Centers (IAC) sponsored by the Defense Technical Information Center (DTIC). The RAC, and indeed the IAC program as a whole, can help program and project managers:

- Cope when short-staffed.
- Analyze large quantities of available information in a particular subject area.
- Ensure that any previous research is considered in their system design.
- Find information from analogous systems for their new systems.
- Search for applicable, and establish contact with, leading researchers and scientists in a particular field.

The RAC facilitates the cost-effective implementation of RMQS throughout all phases of a product's or system's life cycle.

### Support for Program Managers and Military Acquisition

RAC provides support to the defense acquisition community in general, and program managers specifically. Since its creation in 1968, the RAC has worked for a wide range of organizations in the public and private sectors. Our work for acquisition programs includes developing reliability programs, conducting selective reliability analyses, developing traditional reliability and ac-



**By working for a wide range of customers, the RAC is able to transfer lessons learned and best practices from one industry to another, and between the commercial and government sectors.**

celerated life tests, witnessing testing on behalf of the government, developing requests for proposals, and assisting in source selection.

For fielded systems, the RAC focuses on improving the availability of fielded sys-

tems. These projects include working with the Navy Depots to improve their overhaul process; with the U.S. Army Power Reliability Program to increase the availability of Command, Control, Communications, Computers, Intelligence, Surveillance, and Reconnaissance

*Criscimagna is a Science Advisor with Alion Science & Technology in Rome, N.Y., and Deputy Director of the Reliability Analysis Center. He holds a B.S. in Mechanical Engineering from the University of Nebraska-Lincoln, and an M.S. in Systems Engineering from the Air Force Institute of Technology.*

facilities; and with the U.S. Air Force Warner Robbins Air Logistics Center to improve the readiness of electronic countermeasure pods.

By working for a wide range of customers, the RAC is able to transfer lessons learned and best practices from one industry to another, and between the commercial and government sectors.

How does the RAC support program offices? Here are just a few examples.

- A Navy program office program analyst needs information on environmental stress screening for a cost-benefit analysis. She calls the RAC. Within a few hours, she has the necessary information—and at no cost.
- A logistics engineer in an Army program office is looking for commonly used and new methods for predicting basic system reliability. He sends an e-mail to the RAC and receives a reply with the information by the end of the day.
- A logistics analyst with an Air Force Program Office is trying to find a standard factor by which to reduce a contractor's failure rate predictions that will be used to determine how many initial spares should be purchased. He faxes his inquiry to the RAC and is called the next morning by the RAC engineer who gives him the answer to his question.
- A program office needs support to evaluate a reliability growth test proposed by the prime contractor and to monitor the management of the growth process. Lacking the experienced staff to do these long-term tasks, the program office quickly gets the RAC to work without going through the competitive contract process.

### **The Reliability Analysis Center is an IAC**

The RAC is an Information Analysis Center (IAC). The IACs are government organizations regulated by DoD Directive 3200.12; DoD Scientific Technical Information (STI) Program, dated Feb. 11, 1998; and DoD Instruction 3200.14, Principles and Operational Pa-

rameters of the DoD Scientific and Technical Information Program, dated May 23, 1997. The Office of the Secretary of Defense, Director of Defense Research and Engineering provides policy oversight of the IACs. Administrative and operational management is provided through the Defense Information Systems Agency by the Defense Technical Information Center (ATTN: DTIC-AI), 8725 John J. Kingman Road, Ste. 0944, Fort Belvoir, VA 22060-6218. Appointed Contracting Officer Technical Representatives (COTRs) from technical host organizations provide technical management for the IACs.

A primary customer of the RAC and all the IACs is the military acquisition program manager. IACs have scientists, engineers, and information specialists experienced in specific technical areas to help program offices locate, analyze, and use STI. The IAC staffs establish and maintain comprehensive knowledge bases, including historical, technical, scientific, and other information collected throughout the world and pertinent to their respective technical communities. They also collect, maintain, and develop analytical tools and techniques, including databases, models, and simulations. Program and project managers can capitalize on the specific skills of their staff and maximize their tight budgets by calling on the unique and specialized skills of the IACs. The IACs can provide managers with affordable short- and long-term technical services.

The RAC provides technical expertise and information in the engineering disciplines of RMQS and facilitates their cost-effective implementation throughout all phases of the product or system life cycle. Reliability is an aspect of system performance that affects mission success, system availability and readiness, support costs, mobility, and system effectiveness. Designing for maintainability ensures that systems can be safely, economically, and efficiently kept in operating condition.

Quality is and has long been an important aspect of manufacturing, installa-

tion, and other processes. Supportability considers the overall infrastructure, resources, and investment needed to support a system over its operational life.

The RAC is operated by Alion Science & Technology and is located in Rome, N.Y. Patrick Hetherington is the RAC Director. The COTR for the RAC is Richard Hyle, who is with the Air Force Research Laboratory, Information Directorate in Rome, N.Y.

A Steering Committee with voting members from the military services and from DoD provides guidance to the RAC. George Desiderio, Deputy Director, Systems Engineering, Office of the Under Secretary of Defense (Acquisition, Technology and Logistics/Interoperability) is the Chair of the Steering Committee.

### **The RAC Supports the Program Manager in Many Ways**

At the beginning of this article, we listed ways in which the RAC supports Program Offices and Program Managers. The examples given generally fall into two categories: technical support and consulting services.

#### **Technical Support**

Program managers have free access to eight hours of technical support. Technical solutions may be only a telephone call or e-mail message away. To provide quick, accurate answers we call on our staff or extended expert network, conduct bibliographic searches of our more than 70,000 references in the Reliability Analysis Center library, and draw upon our experience and other technical sources.

#### **Consulting Services**

For more extensive technical needs that go beyond our free technical support, program managers can quickly, without the need for a competitive award, get the RAC working as a member of the program office team. When a more detailed answer than can be provided using the RAC's Inquiry Services is needed, RAC can supply both short- and long-term consulting help (on-site when necessary) to satisfy your needs.

In addition to technical support and consulting services, the RAC provides three other key services.

### **Training Services**

RAC presents training courses in virtually all aspects of reliability, maintainability, and quality in both open registration and on-site formats. Courses can be tailored to meet specific user requirements. Courses stress proven approaches and techniques for the designer, analyst, and manager. The RAC teaches about 1,000 public and private sector students each year.

### **Publications and Tools**

RAC offers more than 50 authoritative publications on reliability, maintainability, quality, and supportability as well as software tools to help you design, build, and support effective systems and products. The RAC develops a wide variety of publications in the following categories:

- Analysis and Application Guides
- Commercial Practices
- Data Books
- Quality Improvement
- Reliable Application of Components
- Software Products.

The RAC develops these products leveraging the experience and knowledge that its staff gains in conducting a wide range of projects for our government and industry clients.

### **Current Awareness**

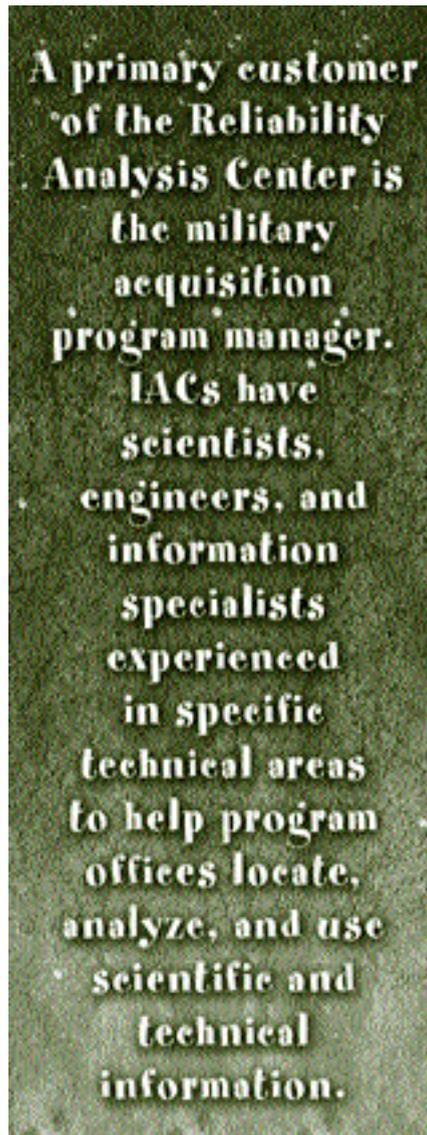
The RAC can help the technical staff of a program office to stay abreast of the latest news, advances in reliability, and the other assurance disciplines.

#### *RAC JOURNAL*

The RAC publishes a free quarterly technical journal containing articles covering engineering advances, policy and standards activities, technology applications, and upcoming events. The focus is on practical knowledge that can be applied to improve RMQS.

#### *START Fact Sheet*

The RAC publishes a series of Fact Sheets, available at no charge, entitled



*Selected Topics in Assurance Related Technologies (START)* intended to “start” the reader's knowledge in a specific technical subject area.

#### *World Wide Web Access*

Users can obtain information on related Web sites (including training, software tools, standards, etc.), conduct online searches of the RAC library, download free copies of the *RAC Journal* and *START Fact Sheets*, check the Calendar of Events, access useful tools free of charge, and order products.

### **Program Managers Have Access to RAC Resources**

The RAC has more than 60 engineers and technical staff members to support its clients. In addition to our strong tech-

nical staff, we have access to more than 1,700 other technical staff members.

### **Subject Matter Experts**

The RAC has a network of subject matter experts (SMEs) to supplement its own staff. In nearly all cases, subject matter experts provide a response gratis. Our SMEs include individuals from academia (e.g., Penn State and Rutgers), industry (e.g., ReliaSoft and JBF), and consulting (e.g., Wayne Nelson for accelerated life testing).

### **Data**

RAC is a worldwide renowned source of reliability data. It maintains extensive quantitative and qualitative databases on components, assemblies and, most recently, systems, and makes the data available through several data products. Data is collected from numerous industry and government test and field sources and is updated on a continual basis.

The RAC created and manages the Data Sharing Consortium (DSC). The DSC compiles and disseminates data on parts and systems, and is open to all commercial, U.S. Government, and foreign organizations. By sharing data, DSC members save costs from the reduction and elimination of redundant testing, and have access to a larger base of data with which to evaluate the quality and reliability of parts and systems. Types of data contained in the DSC include screening, qualification, failure analysis, and field performance of components and systems.

### **Library**

The RAC maintains a complete library that includes articles, books, journals, reports, and other technical documents dealing with RMQS topics. Many of these documents are in electronic format making searches and information retrieval quick and accurate. Our librarian ensures that an abstract, complete with key words, is entered into our library database for each document entered in the library.

An online feature allows visitors to the RAC Web site to search the library using

a concept or key word. The Reliability Analysis Center will only distribute copies of documents for which we hold the copyright, in accordance with copyright laws. In general, search results for RAC publications will indicate RAC as the "performing/publishing agency" or the "source." These RAC products can be ordered from the RAC.

### Putting the RAC to Work for You

For government clients, the process of putting the RAC to work is a straightforward and quick process. First, customers write a task white paper with RAC assistance. Then, the statement of work is sent to our COTR, who ensures

that the work is within the scope of the RAC charter, and prepares a Work Plan and Statement of Work (SOW). After the Work Plan and SOW have been finalized and approved, the RAC sends a technical and cost proposal to the customer. When all parties are satisfied with the SOW and technical and cost proposal, the customer issues a Military Interagency Purchase Request and the RAC starts work.

### 34 Years of Success

The RAC serves the RMQS communities with a wide range of products and services backed by 34 years of experience and successful work. Like all the

IACs, the RAC was established first and foremost to serve the needs of Department of Defense and military organizations. Program managers can especially benefit from the RAC because we are attuned to defense acquisition issues and concerns, can be placed on contract quickly and efficiently, and have worked on improving the reliability, availability, and readiness of many weapon systems.

Editor's Note: The author welcomes comments on this article. Contact him at [NCriscimagna@alionscience.com](mailto:NCriscimagna@alionscience.com). For more information on the RAC, go to <http://rac.alionscience.com>.

## DAU SOUTH REGION GAINS NEW STRATEGIC PARTNERS

To extend its educational strategic partnerships and leverage increased learning opportunities, the Defense Acquisition University (DAU) South Region signed Memorandums of Understanding with Drake State Technical College and Oakwood College; and Letters of Intent with Grambling State University, Tuskegee University, and Bethune-Cookman College. The sign-

ing ceremony was held at the DAU South campus, located in Huntsville, Ala., on Jan. 28, 2003.

For more information on DAU South Region Strategic Partnerships, contact Dr. Jerry Davis, Associate Dean, Outreach and Performance Support, DAU South Region, at [jerry.davis@dau.mil](mailto:jerry.davis@dau.mil). For more information on the DAU South Region, visit the DAU Web site at <http://www.dau.mil>.



Standing from left: Dr. Legand Burge, Dean, College of Engineering Technology and Computer Sciences, Tuskegee University; Dr. Aubrey Long, Chairman, Division of Business Administration, Bethune-Cookman College; James McCullough, Dean, DAU South Region; Dr. Helen McAlpine, President, Drake State Technical College; Hank Valentine, CEO, Histori-

cally Black Colleges & Universities and Minority Institutions; Dr. Delbert Baker, President, Oakwood College; Dr. Obadiah Simmons, Dean, Continuing Education and Special Programs, Grambling State University; and Army Col. Ronald Flom, DAU Commandant.

Photo by Donald Clark