

Space Systems Division



CN Total Quality Management NEWS



Strategic Defense Initiative Programs

"TOTAL QUALITY IN OUR WORK AND OUR PRODUCTS"

MARCH 1990

CNS CONTRACTORS TO JOIN FORCES

In a break from the competition tradition in military procurement, SSTS contractors TRW and Lockheed will cooperatively build a test satellite for the program. These companies had been under competing contracts to work on the surveillance system before this cooperative arrangement.

TQM encourages teaming, as well as effective relationships with suppliers or contractors. This new SSTS arrangement will give the Government access to the best of each contractor's work and will save money that would be spent on unnecessary duplication of effort. #

TQM ORIENTATION COMPLETED

The one hour *Introduction to TQM* has been presented to every program office in CN, except CNI, which had a four hour *TQM Awareness Training* instead. This satisfies the requirement that everyone in Space Systems Division receive a TQM orientation, except for those individuals who were unable to attend. A make-up session will be made available for them.

As a result of this training, members of the various CN program offices have been submitting ideas for ways to improve and possible topics for Process Action Teams (PATs). ###

CN PERSONNEL LEARN AT TQM SYMPOSIUM

Personnel from each CN program office attended the National Security Industrial Association Total Process Management for Space Systems Conference on 6-7 February at the LAX Hyatt. The conference started off with a speech by Space Systems Division commander Lt Gen Donald Cromer, who stated his and SSD's commitment to the implementation of TQM.

Following Lt Gen Cromer was former SDIO Director, Lt Gen (ret) James Abrahamson, who reiterated the importance of TQM and explained how he was now applying its principles at Hughes Aircraft. Leaders from other industries also told their progress in using TQM.

The most interesting success stories came from Xerox and Motorola. Both companies turned around loss of market-share to the Japanese to regain their leadership positions. Xerox used benchmarking of design criteria as well as extensive training of their personnel in TQM methods to regain their lead as the top copier company. Motorola emphasized variability reduction in their design to beat out 17 Japanese firms in producing the top rated pager.

Participation in the conference by CN personnel was sponsored by Mr Bill Briggs' SSD/TQM office as part of the effort to help educate workers and managers at SSD in TQM. Attendees from CN will be passing on the knowledge they gained to their respective SPOs. ###

TQM USED IN COMM DEVELOPMENT

Total Quality Management methods and tools have already been used by various contractors in the development of Strategic Defense Initiative (SDI) hardware. The following is an excerpt of a paper, recently presented at an Armed Forces Communications and Electronics Association (AFCEA) conference, giving an example of such an application of TQM:

TQM used in 60 GHz Receiver

Effective communications is essential for the Strategic Defense System (SDS) to fulfill its mission. In time of war, the Space Based Interceptor (SBI) carrier vehicles must relay tracking information to multitudes of deployed interceptor vehicles.

This must also be done in a potential nuclear environment. The interceptor vehicles use a lightweight, highly effective receiver at a frequency of 60 gigahertz (GHz) to complete their communications link.

The design and development of this 60 GHz receiver employed TQM methodology. SBI contractors Martin-Marietta and Rockwell International were responsible for the system engineering of the receiver. Their sub-contractors, Alpha Industries and Harris Corp. respectively, did the actual design, development, and testing of hardware. The program is in the early demonstration and validation phase, such that the breadboard or brassboard models of
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CNE COORDINATES LESSONS LEARNED WITH CONTRACTORS

By applying the TQM principles of encouraging quality through good communications, as well as striving for continuous improvement, CNE Program Manager Lt Col Eugene Dionne recently initiated a Systems Integration and Test Experience Sharing/Lessons Learned Conference at Lockheed Missiles and Space Company in Sunnyvale, CA. Various government and contractor agencies attended.

The conference objective was to consolidate experiences and examples of things to-do and not-to-do before Starlab goes into System Level Integration and Test. Lockheed and Kaman Aerospace Corp., the Starlab program associate contractors, felt the results were very beneficial.

Because of the success of the conference, a similar effort, aimed at Mission Operations is planned for the near future. Both Starlab contractors have taken major steps in TQM implementation by conducting a complete re-evaluation and subsequent streamlining of their entire manufacturing planning and control operations. ###

CNS STATES VISION

A well-run organization should not only have a mission statement of what its job is, but it should also have a vision of what it wants to achieve in the future.

The CNS team vision statement is: *"to make SSTS the best-run, most successful Space Systems Division program of the 1990s, as recognized throughout SSD and the community."* Such a vision will be a challenge to members of their team, as well as to other organizations. #



"Now they're even talking about TQM in kindergarten!"

PROGRAM DIRECTORS HOLD OFF-SITE

An all day, top level CN off-site meeting of was held on 4 January at Ft. MacArthur. Col Bill O'Brien, the SDI Program Director, and the CN Executive Council spent the day in free discussion and exchange of ideas on program issues and TQM. As a result of this meeting, plans for TQM implementation were solidified.

Several Process Action Teams (PATs) were recommended, including a CN-level Awards PAT. An important strategy in dealing with satisfying our customer SDIO was also established. This included improving the communications with SDIO as a united front of the SDI program offices here at Space Systems Division.

Because of the success of this off-site, it was suggested that the various SPOs also hold off-sites to better communications, to improve the way the work is done, and to help in implementing TQM. ###

TQM adage:

"What you measure, you improve."

CNS ANNOUNCES EXTENSIVE TQM TRAINING PROGRAM

A team of Lt Col Dennis Kawamura, Capt James Stewart, Capt Les Albiol, and 2Lt Michael Gehrlein are coordinating an extensive TQM training program within CNS. The objective is to educate SPO members on TQM management philosophies, applications of technical tools, and new methodologies.

The "Deming Library" videotape series is being shown to interested CNS personnel repeated twice a week in order to introduce the principles and management philosophy behind TQM. The series will be shown from 26 January to 6 April.

SSTS is trying to combine their training with their contractors. They met with contractors TRW and Lockheed to discuss ways to develop a cooperative arrangement for providing education and training to all members of the SSTS/TRW/LMSC team.

Special training in Quality Function Deployment (QFD) is being considered by CNS. Also, a Design of Experiments (Taguchi Method) course has been recommended to SPO and contractor personnel. The 4 - 6 hour TQM Awareness workshop and one week Process Action Team (PAT) training are also being scheduled.

Training of SPO personnel on new (and old) ways to improve effectiveness and program office productivity is essential, and the CNS effort is one that should be emulated by other SPOs. ###

INTERESTING BOOK ON SUCCESS TO READ:

"All You Can Do is All You Can Do..." by A.L. Williams.

PROJECT MANAGEMENT TOOLS TO USE

All of us have projects to do at work. Some projects are relatively simple and straightforward, such as doing specific tasks. Other projects may be quite complex, where the person in charge must keep track of the steps required to complete that project, the schedule, costs, and allocation of resources.

When there are many projects, even if simple ones, it is often necessary to prioritize them to maintain control. When a project is complex, it is also easy to lose control and not manage the project effectively. TQM principles teach us to use quality-enhancing tools to help us improve the way we do our work, as well as to make that work easier. There are software programs available to help handle dealing with the projects we must do as part of our jobs.

For dealing with many relatively simple projects there are commercial *Personal Information Managers* such as Symantec's GrandView and Lotus' Agenda. Complex projects require *Project Management* programs such as Microsoft Project, Harvard Project Manager, and Symantec's Time Line. The Defense Systems Management College (DSMC) Software Distribution Center also has a number of programs available as part of their Program Manager's Support System (PMSS).

Of course, if learning the software is harder than doing the work, it isn't really a good TQM tool to use. The best bet is to ask someone who has used the program for an opinion on ease of use, before investing your time and, in some cases, money. In general, though, these productivity enhancing tools are worthwhile to use and helpful. ###

TQM USED IN COMM DEVELOPMENT

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the receiver have been tested. Verification of nuclear hardening is scheduled next.

Savings as a result of using TQM has not yet been estimated, but the contractors and their sub-contractors feel it will be substantial. The development of this receiver, especially with its greater reliability and reduced cost, will be applicable to other space programs. The new Brilliant Pebbles concept bases its communications on using the SBI 60 GHz receiver. The basic principles of working to satisfy the customer, striving for quality, and continuous improvement were applied to all phases of the development work.

QFD Defines Requirements

The first goal in TQM is to satisfy your customer. A tool to assist in defining what the customer wants is Quality Function Deployment (QFD). The customer's needs are

organized and translated into design criteria. When effectively used, a QFD matrix compares customer requirements with measurable design factors. This planning tool places more emphasis on product definition so to minimize the necessity for redesign.

Rockwell International used QFD to allow System Engineering to interface with Design Engineering and flow customer requirements into design requirements. Use of a QFD matrix helped in interpreting directions from the Air Force in determining their strategy for developing breadboard and brassboard models of the 60 GHz receiver.

Concurrent Engineering Used

Concurrent engineering is a tool that can be put in effect in the early phases of a program as part of the quality effort. It consists of forming engineering teams to have cross-functional communication, doing simultaneous engineering, aiming for problem avoidance, and doing advanced development program (cont'd page 4)

TRY A "ONE-MINUTE PRAISING"

The top selling management book of a few years ago, *The One-Minute Manager*, describes a technique to improve the performance of your support personnel. They call this technique "the one-minute praising."

This method is simply to be alert to spot the good things your people do and then go over and praise that specific good work immediately. It could be a verbal praise or an "attaboy" note on a memo. Such simple acknowledgement of good work dramatically improves morale, attitudes, and future performance, claim the authors.

The book warns, though, that the

praise must be meaningful. They give an example of a manager who went around every Friday, patted people on the back, and said, "Great job." The workers thought he was nuts. His praise wasn't for anything in particular, and thus it made no impact on their performance.

Acknowledge when your support does something good, even if it is just a small thing. Acknowledge the good work done by your secretary, Aerospace help, contractor support, or anyone else who supplies work or products to you. Their continued quality work will mean that you will then be supplying better products or work to your customer or supervisor. And that's TQM in action. ###

TQM USED IN COMM DEVELOPMENT

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integration. In the development of the 60 GHz receiver, both of the SBI contractors employed forms of concurrent engineering.

Martin-Marietta combined technical areas to solve problems up front, instead of having to correct failures later on, thus taking much of the risk out of the product development. They formed multi-functional teams to identify all life-cycle issues and place emphasis on product and process definition. Martin calls these teams *High Performance Working Groups*. Martin decided to build in nuclear hardening of the receiver at the brassboard level. They tested equivalent parts and electronics for hardness beforehand.

Improvement Teams

Teams to study and improve the various processes involved in developing a product are an important tool for continuous improvement. Another way to encourage continuous improvement is for management to get the engineers and technicians more involved in the decision-making process.

Efforts are being made in all organizations to do this. Alpha Industries employs Process Action Teams for improving methodology on producing the 60 GHz receiver components. These teams discuss and recommend changes in the processes required in manufacturing of the components. Harris Corp. has what they call a PEOPLE program that aligns personnel in special work teams to develop and continuously improve their products.

Work Completed

As a result of the development work by Rockwell and their sub-

contractor Harris Corp., they were able to successfully demonstrate an end-to-end breadboard of the 60 GHz receiver to the Air Force. By using TQM in their planning strategy, they feel they will be well prepared for underground nuclear hardening testing on their model, due to its robust design.

Martin-Marietta and their subcontractor Alpha Industries are confident that their extensive planning and up-front testing of similar components will result in failure-free nuclear hardening testing of their brassboard model. They feel their programs to promote TQM within their design and testing organizations will assist in providing a more quality product to the Air Force.

Conclusion

Although the use of TQM in the development and testing of the 60 GHz receiver for the SBI program is estimated to have helped to reduce the development cost and to improve the delivery schedule, its implementation has not been complete enough to fully make the impact that is possible. Continued use of new and improved techniques in the development of our communications hardware will allow us to produce higher quality goods at reasonable costs. ###

"Success is getting up just one more time than you fall down."

Mike Tyson

CNW HOLDS THEIR FIRST OFF-SITE

Col Jim Simmons and his TQM Corporate Council held a half-day off-site on 31 January. The format paralleled that of the CN off-site, with open discussion of issues and concerns.

Major issues discussed were increasing involvement of civilians in management, civilian promotions, and formation of a PAT to improve the SPO security library. Another half-day off-site and a full-day off-site are planned. ###

SECRETARY PAT STARTED

The kick-off meeting of the CN Secretary Process Action Team (PAT) was recently held. The objective of this PAT is to improve the process of the work done by the CN secretaries. This includes both improving the output of the secretaries and also improving the way they are tasked and rewarded.

Supervisors and secretaries from several CN SPOs were given an overview on PATs and explained how the discussions and brainstorming will lead to changes and improvements. In the next meeting, the Secretary PAT will start outlining work and communication processes and determine a tentative schedule for results. ###

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