

National Aeronautics and  
Space Administration

**George C. Marshall Space Flight Center**  
Marshall Space Flight Center, AL 35812



October 29, 2002

Reply to Attn of: DA01

TO: Distribution

FROM: DA01/A. G. Stephenson

SUBJECT: Minutes of the MSFC Quality Council Meeting

The MSFC Quality Council (MQC) met on Friday, October 11, 2002. The meeting began at 9:00 a.m., in Building 4200, Conference Room P110. The roster of attendees for the meeting is attached as Enclosure 1. The presentation charts for the meeting are included as Enclosure 2.

OPENING REMARKS (A. ROTH/DE01):

There was nothing to note in opening remarks except that the next NQA audit will take place during the first week of next month. The agenda for the meeting was reviewed.

The agenda for the meeting is included on page 3 of Enclosure 2.

MQC ACTION ITEMS (A. ROTH/DE01):

All previous actions were closed at the last meeting on June 24, and no new actions were issued.

CONTINUAL IMPROVEMENT SUCCESS STORY (A. EIDSON/QS50):

Alvin Eidson presented a success story on a process improvement in explosion safe distance determination. The new methodology is now being utilized to calculate safe distances for each potential explosive operation.

The presentation charts are included as pages 5-9 of Enclosure 2.

SUCCESS STORY FOR COLLABORATIVE EFFORT WITH ORGANIZATIONS  
OUTSIDE OF MSFC (F. ROE/ED19):

Fred Roe presented a success story on the collaborative efforts related to the development of an automated rendezvous sensor. There has been a factor of ten improvement in the system with the new box, which is shown on page 14 of Enclosure 2.

The presentation charts are included as pages 10-17 of Enclosure 2.

CONTINUAL LEARNING (J. SANCHEZ/FD35):

Julie Sanchez presented a success story on continual learning improvements related to the payload training data collection system for the International Space Station (ISS). This system is the method by which crew training requirements are collected for ISS payloads so that training plans, curricula and lessons can be developed. The changes that are being made are aimed at simplifying the requirements on the ISS customer. The amount of data, method of collection and baselining processes have all been streamlined, while at the same time providing a technically improved output.

Art Stephenson commented that NASA needs to reinvent its processes around Station operation, and the NASA interfaces have to be significantly improved. There will be a lot more opportunity for the type of activity that has been discussed here.

The presentation charts are included as pages 18-25 of Enclosure 2.

CUSTOMER SATISFACTION (I. KUBERG/AD41):

Inge Kuberg presented a success story on customer satisfaction in the supply process. Customers can now access the online supply catalog from their desktop, place an order, and receive the supplies on the next day at their office.

The presentation charts are included as pages 26-27 of Enclosure 2.

Art Stephenson thanked the group for the success stories presented.

BALANCED SCORECARD, CONTINUAL IMPROVEMENT, AND CUSTOMER SATISFACTION (M. MCLEAN/CD40):

Michael McLean provided a status on the Balanced Scorecard, Continual Improvement, and Customer Satisfaction websites. Only five organizations have provided final input for the past year's metrics. (The Engineering Directorate provided their final status after the chart on page 30 was printed.) The Customer Satisfaction and Continual Improvement websites have not been utilized much by the organizations. All organizations are required to input their customer satisfaction system status on the Customer Satisfaction website. Representatives for each organization that were in attendance were requested to pass this message back to their managers, if they were not present.

The presentation charts are included as pages 28-32 of Enclosure 2.

PROCESS PERFORMANCE AND PRODUCT CONFORMITY (R. GLADWIN/VS10):

Richard Gladwin provided the report on process performance and product conformity. The data from the Monthly Executive Summaries submitted by ED, MP, FD, TD, and SD has been compiled for October 2001 through August 2002. The numbers on the chart designate the number of projects that are being reported on monthly. These metrics are at an extremely high level, and because of inconsistencies in the units being reported, are

not statistically appropriate. This is probably the last time this particular chart will be shown.

The Executive Summary Chart is included on page 34 of Enclosure 2.

A proposal was made with data from one month to show the stop-light status of both the programs and projects at MSFC. The first chart shows how many red, yellow, and green statuses were reported for the programs and projects. The next two charts break out the data into the four areas of management, cost, schedule, and technical. Future charts would show trends. No new data or extra reports are being requested from the programs/projects to generate these charts. The Systems Management Office has just requested copies of reports that are already being generated.

Data for the Second Generation Reusable Launch Vehicle Program Office and the Integrated Financial Management Project will be added in future.

Over time, we would like to see better metrics reported here and at the PMC.

The Program/Project Status Charts for July 2002 are included on pages 35-38 of Enclosure 2.

The status of the Marshall Directives was also provided as a measure of our processes. There are currently four active waivers against three of the 188 Directives that are in place today. The documented system appears to be adequate. The status is provided on page 39 of Enclosure 2.

INTERNAL QUALITY AUDIT REPORT (W. WOODS/QS40):

Warren Woods presented the status of the internal audit program. Three audits have been conducted since the last meeting. The draft audit schedule for 2003 is out for review by the organizations. Fifteen audits are planned at this time.

The top four categories of findings include industrial safety issues, document control, control of quality records, and lack of awareness of quality objectives. There has been some improvement in record keeping. Art Stephenson asked if there were actions around each of the issues and stated that each organization should take actions to make improvements in these areas.

Axel Roth and Warren Woods have met with all Directorates/Offices and discussed their major findings, as well as other audit issues. Currently, follow-ups are performed at the completion of corrective action and then again at the next annual audit.

**ACTION MQC-0051: All Organizations should provide plans to Axel Roth/DE01 and Warren Woods/QS40 on how they are addressing the top four findings presented for the audit program: industrial safety issues; document and data control; quality records; and lack of awareness of quality objectives.  
(All Managers/Directors, Due: January 31, 2003)**

**ACTION MQC-0052: The audit program should provide for additional targeted audits to be planned when systemic problems are identified during the audits of the organizations. Also, follow-ups for effectiveness should be performed sooner, instead of waiting for the next audit of each organization.  
(Warren Woods/QS40, Due: January 31, 2003)**

Deborah Wills/AD33 stated that she is putting together a checklist for the annual Directives review to help the document owners with being aware of what to look for. Hopefully, this will prevent future documentation-related nonconformances.

The status chart for internal nonconformance reports (NCRs) was discussed. As of today, there are two open NCRs that are late. This is an ongoing area of emphasis.

The presentation charts are included as pages 40-44 of Enclosure 2.

**CORRECTIVE AND PREVENTIVE ACTION PROGRAM (J. MCPHERSON/HEI):**  
John McPherson provided a status of the corrective and preventive action program at MSFC. The corrective and preventive action programs are being employed by the Center, with continued increases in customer feedback activity at the Center level. The number of discrepancy reports was unusually high since the last MQC. Only six issues have been issued as Recurrence Control Action Requests (RCARs) since June 19.

Acute Launch Emergency Restraint Tip (ALERT) activities have increased. On the positive side, the ALERT system was used to help a project procure an item within one month instead of the four months that was initially projected. A large number of ALERTs are delinquent for responses. All affected organizations have received their status report, and there has been a great deal of effort in some of them to begin working these numbers down. (Note that the Science Directorate has forty individuals who receive ALERTs compared to ten or less individuals that are ALERT coordinators in other organizations.)

Three recommendations were made:

1. All Directorates should review MWI 1280.5, "MSFC ALERT Processing," and ensure understanding of the requirements. If there are any problems/questions, feedback should be provided to John McPherson/HEI. The procedure was approved in 1999, and we need to ensure that people are using the system.
2. ALERT Coordinators need to provide responses for each ALERT received. ALERT Coordinators should have adequate technical knowledge to work issues and need to accept responsibility and accountability for performing this function.
3. The Safety and Mission Assurance Office needs to continue reporting ALERT status until the numbers are down and then on an ongoing basis.

The presentation charts are included as pages 45-48 of Enclosure 2.

**ACTION MQC-0053: Each Organization should designate a single point of contact to be accountable for getting the delinquent ALERT numbers down.  
(All Affected Manager/Directors, Due: October 29, 2002)**

**ACTION MQC-0054: Each Organization will present their own ALERT numbers at the next MQC meeting.  
(Affected Managers/Directors, Due: Next MQC Meeting)**

**STATUS OF NQA FINDINGS (M. DEMURRAY/HEI):**

Mary DeMurray provided a status of the eleven findings that resulted from the last surveillance audit of MSFC by NQA on May 30-31. Thirteen nonconformance reports (NCRs) were generated from the eleven NQA findings. Actions have been completed for six NCRs, six NCRs have gone late and have new target dates, and one NCR is not due yet.

Art Stephenson discussed our excellence value and holding others accountable for what they said they would do. Axel Roth was asked to get with the direct reports who owe actions and work these NCRs to resolution before the next NQA audit.

The presentation charts are included as pages 49-50 of Enclosure 2.

**CLOSING REMARKS (A. ROTH/DE01):**

Axel Roth provided closing remarks. The next NQA surveillance audit will be conducted on November 5-7. All MSFC activities are subject to audit; however, emphasis will continue to be on those activities providing products/services to external customers. Everyone is encouraged to visit the ISO web page for self-assessment checklists and other information about the upcoming audit.

The Integrated Financial Management Program (IFMP) is the only major activity that is expected to affect the Marshall Management System. An online quick reference guide is available to provide instructions/assistance.

Organizations need to continue implementation of their customer satisfaction systems and educating individuals on their role in supporting quality objectives.

Overall, the suitability, effectiveness, and adequacy of the Marshall Management System appear to be acceptable. No major problems have been identified by any means, including internal and external audits, and customer satisfaction indicators are positive overall. The system is in pretty good shape.

The presentation charts are included as pages 51-55 of Enclosure 2.

**CENTER DIRECTOR'S CLOSING REMARKS (A. STEPHENSON/DA01):**

Art Stephenson closed with comments about Freedom to Manage (F2M). F2M is there to allow people to suggest processes that they feel can be improved upon. A large number have been sent up to Headquarters for the Agency, but we're not seeing a lot coming from employees about improvements at the Center.

During a recent safety walk-through in the test area, an opportunity was identified by a person who had not submitted a F2M suggestion about it. Another four or five ideas were generated during one discussion in this area. People have not been using the system.

Management is accountable for getting back with people on each suggestion with a status, and there ought to be a timeframe for providing this feedback. Are we really encouraging people to come up with ideas and use the F2M system? There will be a visit from headquarters in the not-too-distant future on this topic.

Also, Innovative Dynamic Employees' Active Solutions (IDEAS) and F2M will be tied in together. If one suggestion coming in to one of the systems doesn't seem appropriate, it will be moved over to the other group for resolution.

**Action MQC-0055: Include a report on Freedom to Manage (F2M) process improvements/success stories at the next MQC meeting.**  
**(Axel Roth/DE01 and Johnny Stephenson/ED02, Due: Next MQC Meeting)**

No other items for record were discussed at the meeting. M. DeMurray/HEI kept the meeting minutes.



A. G. Stephenson  
Chairman  
MSFC Quality Council

Enclosures

- 1 Attendance Roster
- 2 MQC Presentation Charts

Distribution:  
Council Members  
Meeting Attendees

# Enclosure 1

## ISO 9000 MSFC QUALITY COUNCIL MEETING

DATE: Friday, October 11, 2002 LOCATION/ TIME: BLDG. 4200/P110, 9:00 – 11:00 a.m.

MEETING ATTENDANCE: [Please initial next to your name to record meeting attendance.]

<u>NAME</u>	<u>ORGANIZATION</u>	<u>PHONE</u>	<u>FAX</u>
<b>Director's Office</b>			
<u>AS</u> Art Stephenson	DA01	544-1912	544-5228
James W. Bilbro	DA01	544-3467	544-8345
Bob L. Sackheim	DA01	544-1938	
Jim Kennedy	DD01	544-1914	544-5896
<u>AR</u> Axel Roth	DE01	544-0451	544-5590
<b>Center Operations Directorate</b>			
Sheila Cloud	AD01	544-0120	544-5893
<u>JC</u> Jim Carter	AD01	544-6630	544-7920
Linda Carpenter	AD02	544-8236	544-5867
Dan Adams	AD10	544-1614	544-8259
Allen Elliott	AD10	544-0662	
Mike Reynolds	AD10	544-9606	
Lucy Boger	AD21	544-0320	
Lana Cucarola	AD30	544-0096	544-8752
Annette Tingle	AD30	544-4522	544-8752
<u>DW</u> Deborah Wills	AD33	544-4525	544-8610
Lisa Adkins	AD40	544-7546	544-6570
Polly Edwards	AD50	544-4536	544-2101
Inge Kuberg	AD41	544-5078	
<b>Customer &amp; Employee Relations Directorate</b>			
Tereasa Washington	CD01	544-7491	544-6420
Susan Cloud	CD01	544-5377	544-2610
Pat Shultz	CD20	544-7559	544-4809
Caroline Wang	CD30	544-3887	544-6030
Steve Durham	CD40	544-0390	544-0007
<u>MM</u> Michael McLean	CD40	544-0397	544-0007
<b>Engineering Directorate</b>			
Bill Kilpatrick	ED01	544-1001	544-5896
<u>DTM</u> David Throckmorton	ED01	544-1001	544-5896
<u>ML</u> Pat Layky	ED12	544-3481	544-3098
Terry Roberts	ED16	544-3717	544-0900
Jim Lindsay	ED20	544-1301	544-0236
Craig Garrison	ED27	544-7197	544-8838
Rich Wegrich	ED35	544-2626	
Richard Lamb	ED37	544-1037	544-4307
<u>CS</u> Herb Shivers	ED43	544-8903	544-9614
Margaret Alexander	ED44	544-6964	
<b>Flight Projects Directorate</b>			
Jan Davis	FD01	544-0455	544-7580
Anthony R. Lavoie	FD01	544-2332	
<u>JS</u> Jackie Steadman	FD10	544-1940	544-5590
Jack Stokes	FD22	544-1764	544-5194
Steve Meacham	FD30	544-0241	544-4393
Mike Kearney	FD40	544-2029	
Bill Mordan	FD40	544-2011	

**Chief Counsel**

<u>      </u> Bill Hicks	LS01	544-0010	544-0258
<u>      </u> Jim Frees	LS01	544-0123	544-5867
<u>      </u> Abbie Johnson	LS01	544-0014	544-0258

**Space Shuttle Projects Office**

<u>      </u> Alex McCool	MP01	544-0718	544-2432
<u>      </u> Jodie Singer	MP01	544-0612	544-4155
<u>      </u> Jeff Spencer	MP21	544-7498	544-7713
<i>mp</i> <u>      </u> John Pea	MP71	544-8437	544-5799

**Equal Opportunity Office**

<u>      </u> Charles Scales	OS01	544-4927	544-2411
<u>      </u> Willie Love	OS01	544-0088	544-2411
<u>      </u> Billie Swinford	OS01	544-0087	544-2411

**Procurement Office**

<i>elp for:</i> <u>      </u> Steve Beale	PS01	544-0257	544-3214
<u>      </u> Byron Butler	PS01	544-0253	544-4400
<u>      </u> Ray Woods	PS10	544-0384	544-3223
<u>      </u> Jerry Williams	PS10	544-0295	544-4401
<u>      </u> Jim Young	PS10	544-0362	544-3223

**Safety and Mission Assurance**

<i>AWD for</i> <u>      </u> Amanda H. Goodson	QS01	544-2353	544-2053
<u>      </u> Roy Malone	QS01	544-0506	
<u>      </u> Terry Hamm	QS10	544-7402	544-3241
<i>JB</i> <u>      </u> Jack Beasley	QS40	544-0630	
<i>DM</i> <u>      </u> Don Miller	QS40	544-8361	544-4857
<i>KA</i> <u>      </u> Kerry Warner	QS40	544-7350	544-8585
<i>W</i> <u>      </u> Warren Woods	QS40	544-2275	544-5685

**Office of Financial Officer**

<i>DKS</i> <u>      </u> Dave Bates	RS01	544-0052	544-0635
<u>      </u> Frank D. Mayhall	RS01	544-7266	544-4479
<u>      </u> Peggy Williamson	RS24	544-3357	544-5863
<i>shh</i> <u>      </u> Sharal Huegele	RS30	544-7286	544-9055

**Science Directorate**

<i>ED Br</i> <u>      </u> Ann Whitaker	SD01	544-2481	544-5877
<u>      </u> Rex Geveden	SD01	544-9335	544-5975
<u>      </u> Tom Fleming	SD01	544-3962	544-5975
<u>      </u> Emily Kendall	SD02	544-3775	
<u>      </u> Robin Henderson	SD10	544-1738	544-8639
<u>      </u> Steve Lambing	SD12	544-2277	
<u>      </u> Lloyd Love	SD20	544-7702	544-2559
<u>      </u> Wes Darbro	SD22	544-7742	544-2559
<u>      </u> Roger Chassay	SD30	544-1969	544-5975
<u>      </u> Cassandra Thompson	SD30	544-3993	
<u>      </u> Clark Darty	SD40	544-2728	544-5892
<i>X</i> <u>      </u> Tom Dollman	SD40	544-6568	544-8500
<u>      </u> Melanie Bodiford	SD44	544-2067	
<u>      </u> Mike Purvey	SD44	544-3592	
<u>      </u> Mike McCollough	SD50	544-4368	544-5800
<u>      </u> Ed Reichmann	SD50	544-7603	544-5800
<u>      </u> Tim Miller	SD60	922-5882	922-5823
<u>      </u> Diane Samuelson	SD60	922-5832	922-5723
<u>      </u> Roy Young	SD70	544-4965	544-2659
<u>      </u> Tommy L. Thompson	SD72	544-3489	544-2659





Enclosure 2

George C. Marshall  
Space Flight Center

# Marshall Quality Council

October 11, 2002



# Opening Remarks

Art Stephenson – Axel Roth



- MQC Action Items Status (Axel Roth – DE01)
- Continual Improvement
  - Continual Improvement Success Story (Alvin Eidson – QS50)
  - Collaborative Efforts with Organizations Outside of MSFC (Fred Roe – ED19)
  - Continual Learning (Julie Sanchez – FD35)
  - Customer Satisfaction Success Story (Inge Kuberg – AD41)
- Balanced Scorecard, Continual Improvement, and Customer Satisfaction (Michael McLean – CD40)
- Process Performance and Product Conformity (Richard Gladwin – VS10)
- Internal Quality Audit Report (Warren Woods – QS40)
- Corrective and Preventive Action Program (John McPherson - HEI)
- Status of NQA Findings (Mary DeMurray - HEI)
- Closing Remarks (Axel Roth – DE01)
  - Changes That Could Affect the MMS
  - Issues & Recommendations
  - Assessment of the suitability, adequacy, and effectiveness of the MMS



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MQC Action Items Status – Axel Roth/ DE01

All actions were closed, and no new actions were generated during the last MQC meeting on June 24.



# Continual Improvement Success Story

## **EXPLOSION SAFE DISTANCE DETERMINATION PROCESS IMPROVEMENT**

Alvin Eidson/QS50



# EXPLOSION SAFE DISTANCE DETERMINATION PROCESS IMPROVEMENT

Alvin Eidson/QS50



## ISSUE

- Catastrophic failure of the Army Vortex Thrust Chamber at MSFC Test Stand 115 revealed inadequate “safe” distance predictions for explosive fragmentation

## BACKGROUND

- Safe distances are established for each potential explosive operation
- NSS 1740.12 (Safety Standard for Explosives, Propellants, and Pyrotechnics) provides safe distance requirements for MSFC explosive operations



# EXPLOSION SAFE DISTANCE DETERMINATION PROCESS IMPROVEMENT

Alvin Eidson/QS50



## BACKGROUND (cont.)

- Liquid propellant safe distances based on quantity of propellant on hand
  - Explosive mixture at test article (i.e., fragmentation) not taken into account
- Following the Army Vortex failure, Industrial Safety immediately established a 1250-foot safe distance for all hot fire tests
  - NSS 1740.12 requirement for 0 – 30,000 lbs. Class 1.1 explosive
- Contracted expert to perform fragmentation analysis of existing test operation
  - Reduced safe distances based on analysis and DoD 6055.9



# EXPLOSION SAFE DISTANCE DETERMINATION PROCESS IMPROVEMENT

Alvin Eidson/QS50



## PROCESS IMPROVEMENT

- Researched established requirements (DoD, Army, Air Force, etc.)
- Hired explosives blast analysis expert to develop primary fragmentation methodology
  - Predict fragment size, shape, and speed
  - Predict hazardous fragment area density and minimum safe distance
- Code Q expressing interest in this process



# EXPLOSION SAFE DISTANCE DETERMINATION PROCESS IMPROVEMENT

Alvin Eidson/QS50



## PROCESS IMPROVEMENT (cont.)

- Purchased Vapor Phase Explosion Damage Assessment Software (VEXDAM)
  - Evaluates structural damage based on construction materials
  - Predicts injury to 28 internal body parts of personnel
- S&MA and TD personnel trained in new process (15 days)
- Developing MWI/OI to document new methodology

## SUMMARY

- New methodology now being utilized to calculate safe distances for each potential explosive operation



# Success Story for Collaborative Effort with Organizations Outside of MSFC

## Development of an Automated Rendezvous Sensor

Fred Roe - Avionics Department

ED10/19



Collaborative Efforts with Organizations Outside of MSFC –Fred Roe/ ED19

- The U.S. does not have the capability to conduct automated rendezvous and docking operations in space and is reliant on manned systems.
- The rendezvous sensor was identified as the key technology to allow unmanned automated rendezvous and docking.
- The MSFC Automated Rendezvous and Capture (AR&C) Program developed and ground tested a demonstration system (hardware and software) during the 90's.
- The developed rendezvous sensor technology was demonstrated in space on the STS87 and STS95 flights.

# SENSOR HEAD AND ELECTRONIC MODULE



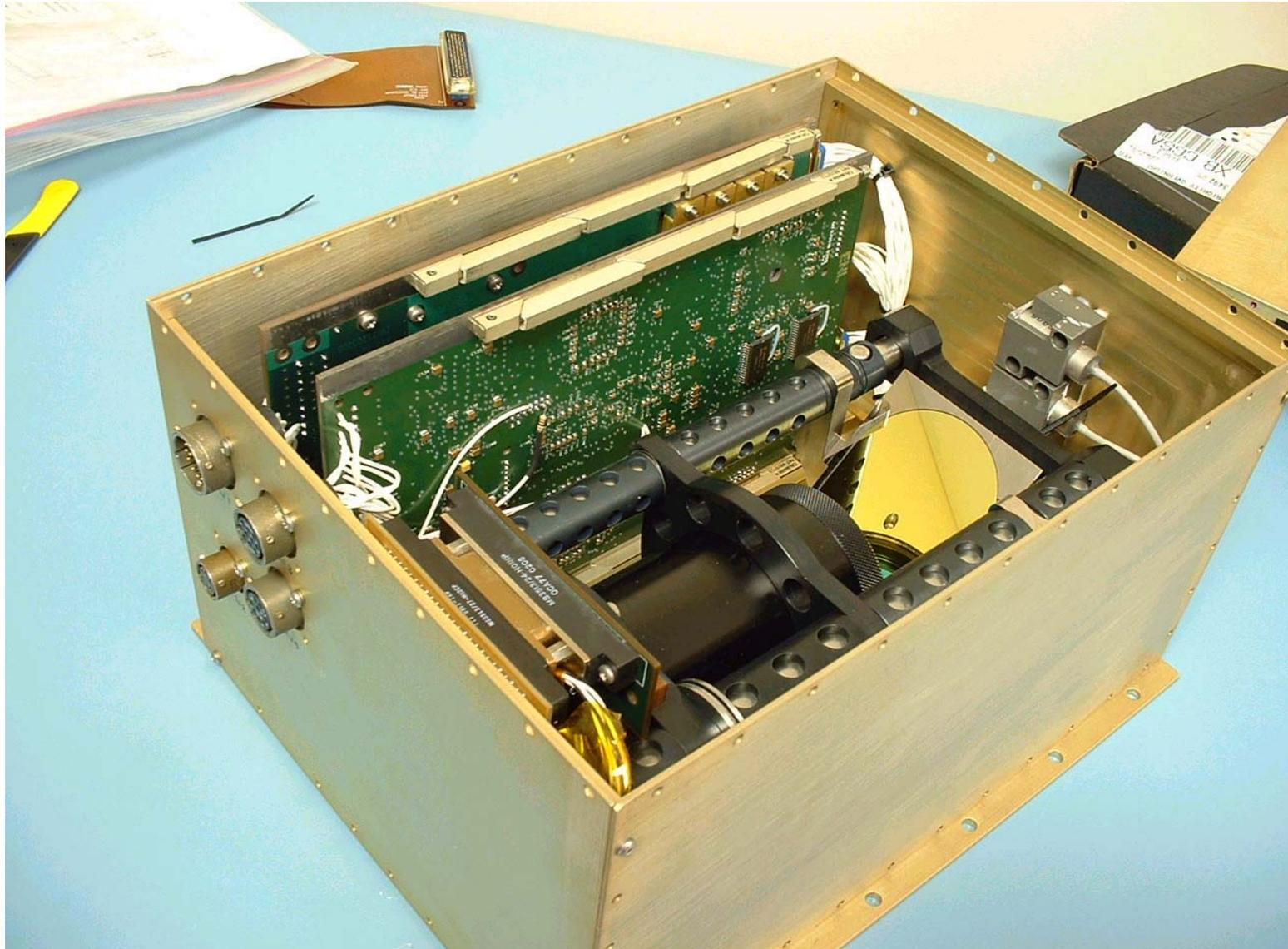


Collaborative Efforts with Organizations Outside of MSFC –Fred Roe/ ED19

## The Advanced Video Guidance Sensor

- Using lessons learned from the STS87 and 95 flight experiments ED19 began development of the next generation of rendezvous sensor technology
  - Increased performance and longer range capability
- Initial funding by MSFC CDDF
- Engineering design was available when customer base was established

# Initial Proto-Type Unit





Collaborative Efforts with Organizations Outside of MSFC –Fred Roe/ ED19

- Major U.S. AR&C programs today:
  - DART: Demonstration Automated Rendezvous Technology.
    - Orbital Sciences Corporation
  - AAS: Alternate Access to Station
    - Boeing, Lockheed, Andrews, CSI
  - DARPA Orbital Express
    - Boeing
  - SLI TA9.8 Automated Rendezvous and Mating (AR&M)
    - JSC



Collaborative Efforts with Organizations Outside of MSFC –Fred Roe/ ED19

## How ED19 is involved:

- **DART:** TA with OSC to provide engineering services to assist in the development and test of an Advance Video Guidance Sensor(AVGS). Primary sensor for the DART mission.
  - Orbital will offer the AVGS as a commercial product.
- **AAS:** Three of the four contractors have baselined the AVGS as their rendezvous sensor. MSFC will provide engineering services and system testing .
- **DARPA Orbital Express:** All three bidders for Phase B chose the AVGS as their rendezvous sensor. ED19 will assist Boeing in AR&C system development by testing the proposed Boeing AR&C subsystem in the Flight Robotic Laboratory under a Space Act Agreement negotiated through the MSFC Technology Transfer Office.
- **SLI:** ED19 is a member of the AR&M working group.



## Where do we go from here:

- ISS rendezvous flight experiments, joint JSC/MSFC SLI Program.
- Next Generation rendezvous sensor development.

### Funding possibilities are:

- Program direct funding
- CDDF or IR&D funding
- SBIR subtopic funding



# Continual Learning

## ***Training Data Set Process Improvements***

**Julie N. Sanchez**

Marshall Space Flight Center

Flight Projects Directorate

Training and Crew Operations Group

256-544-5304

[julie.sanchez@msfc.nasa.gov](mailto:julie.sanchez@msfc.nasa.gov)



# *Contents*

- Making It Better
- MSFC Values at Work
- The Reaction...and I Quote...
- Dedicated to Continuous Improvement



## ***Making it Better***

### **Was**

- Two products developed to meet multiple customer requirements
  - Payload Lesson Change Request
  - Training Dataset
- Two Configuration Management Process
  - Multiple reviews of same data in different formats
  - Data had to be re-baselined for every increment
- Large volume of data requested
  - Data not entered according to template, so workarounds created.

### **Is**

- Single Product to meet both customers' needs:
  - Redesigned Training Dataset to produce the PLCR as a report
  - Report electronically submitted
- Single CM Process
  - One review of data!
  - Submit changes only for subsequent increments
- Reduced volume of data
  - Proposed elimination of portions of dataset that are not required. (still in work)
  - Training Team assists in data entry

## ***MSFC Values at Work***



Customers

- Providing an efficient and streamlined process to customers. Making Customer Service a first priority.
  - Payload Developers
  - Crew Office
  - Mission Operations Directorate (MOD)
  - ISS Payloads Office



People

- Keeping in mind the workload of the personnel involved in the processes
  - Reduction in number of Change Requests for review
  - Reduction in number of pages to review (from 300 pages/Inc to 100 pages/Inc to less than 30 pages/Inc for new payloads only)
  - Reduction in total amount of data submitted

## ***MSFC Values at Work***



Innovation

- Creating new and simpler ways of doing business, challenging externally imposed requirements and processes
  - Changed Configuration Management Process
  - Redesigned Dataset
  - Use electronic data exchange

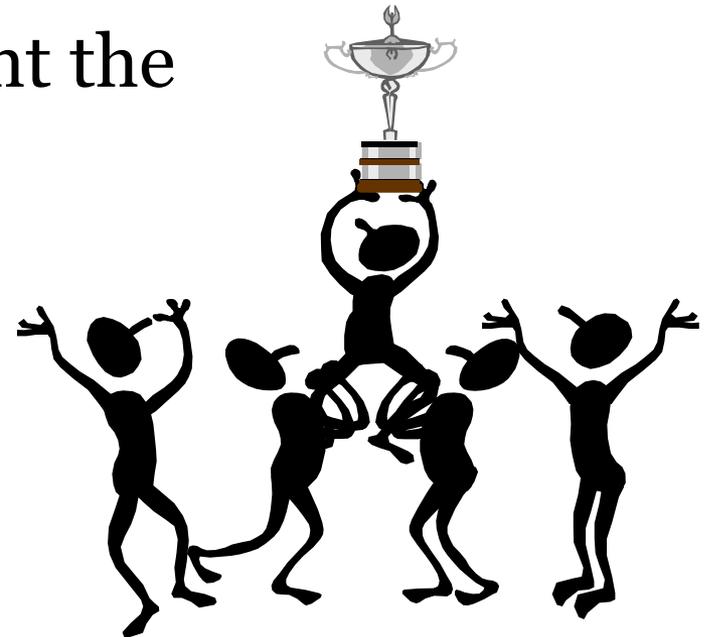


Excellence

- Striving for excellence in all we do
  - Dedicated team willing to work hard to provide excellent services
  - Producing a single process and set of products that meet everyone's needs

## ***MSFC Values at Work***

- Working internal and external team to recommend and implement the process improvements
  - Crew Training Team
  - Ground Support Personnel Team
  - Payload Data Library Team
  - Payload Operations Directors
  - Configuration Management
  - ISS Payloads Office



Teamwork



## ***The Reaction...and I quote...***

- “MSG is at a point where we can definitely baseline our crew training for multiple increments. I concur with the change. Thanks.”
  - Dave Argenti
- “Y'all need to teach these skills to some of the other data sets.”
  - Tammy Hone, PCG
- “EXCELLENT idea!!!!!!!!!! Whoever came up with this idea is Brilliant!”
  - Tammy Hone, PCG
- "You guys are so good to us. Working with you is such a pleasure."
  - Debbie Brown, EPO



## ***Dedicated to Continuous Improvement***

- Future Efforts

- Complete baselining of individual payloads in training dataset
- Complete proposed changes to ground support personnel dataset
- Participate in Lean Six Sigma Process

Improvement effort to further streamline process



# Center Operations Directorate Logistics Services Department



## Customer Satisfaction Success Story

AD41/Inge Kuberg

October 11, 2002

# Customer Satisfaction in the Supply Process



Inga Kuberg/ AD41

**History** — All supplies and materials were ordered by AD40 and stocked in the Substore at Building 4471. Customers would visit the Substore to pick up their required items.

**Improved Process** — Many items previously available from the Substore are now available via the Just-in-Time (JIT) desktop delivery services. This includes all administrative office supplies and other commodities (i.e., picture frames; ink cartridges; compact disks; floor mats; kleenex tissue; batteries; waste baskets; white boards; zip drives).

**Results** — Customer can access the online supply catalog from their desktop, place an order, and receive the required supplies the next day at their office.



NASA  
MARSHALL  
CENTER  
supporting the future

George C. Marshall  
Space Flight Center



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# **Balanced Scorecard, Continual Improvement & Customer Satisfaction**

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**October 11, 2002**

***Presented to the Marshall Quality Council  
by  
Michael McLean***



Balance Scorecard, Continual Improvement & Customer Satisfaction  
Michael McLean/ CD40

***“It is better to look ahead  
and prepare than to look  
back and regret.”***

*– unknown*



Balance Scorecard, Continual Improvement & Customer Satisfaction  
Michael McLean/ CD40

**– BALANCED SCORECARD –**

**100% Final Status**

CD  
OS  
TD  
UP

**Some (remaining/total)**

FD (1/26)  
LS (1/2)  
MP (10/11)  
QS (4/5)  
RS (4/6)  
SD (25/65)  
VS (3/6)

**No Final Status**

AD  
ED  
PS

- ▶ **185 Center-level metrics**
- ▶ **All are current, but most need final input**



Balance Scorecard, Continual Improvement & Customer Satisfaction  
 Michael McLean/ CD40

**– CONTINUAL IMPROVEMENT –**

<i>Organization</i>	<i>Number of Success Stories</i>	<i>Date</i>
AD	5	05-30-02
CD	10	08-20-02
ED	7	05-14-02
FD	0	-
LS	1	08-27-01
MP	1	03-25-02
OS	1	10-03-02
PS	0	-
QS	1	08-28-01
RS	1	10-09-02
SD	1	08-29-01
TD	5	12-06-01
UP	0	-
VS	0	-

Note: Data from CI Website



**– CUSTOMER SATISFACTION –**

- ▶ **Customer Satisfaction (CS) activities being conducted at Center; however, summaries are not being updated.**
- ▶ **POC’s asked to make CS “living” system.**

January 2002	May 2002	September 2002	October 2002
RS	UP	CD	QS
VS	AD		
	ED		
	OS		
	FD		
	LS		
	PS		



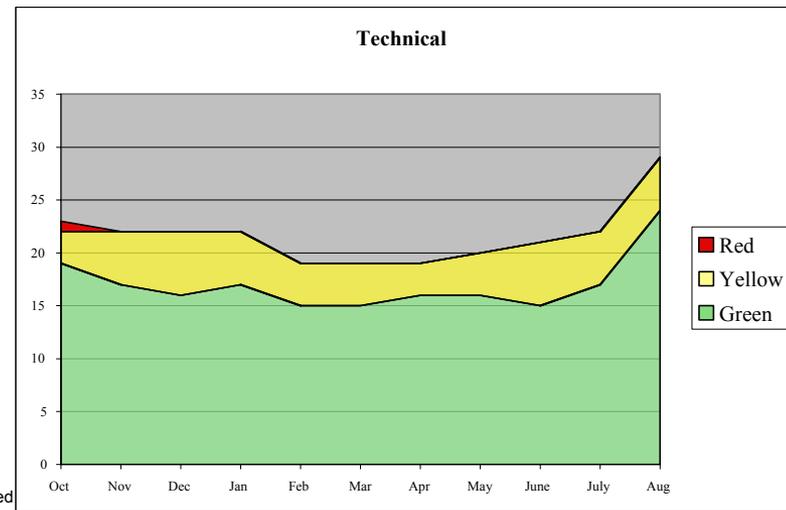
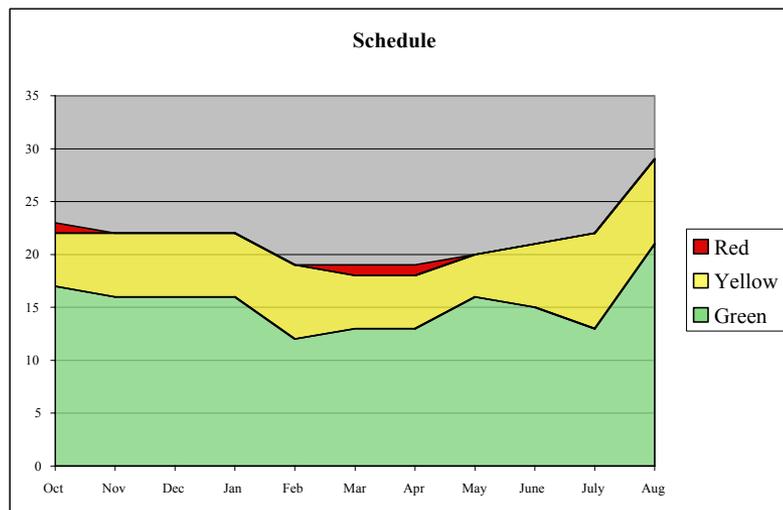
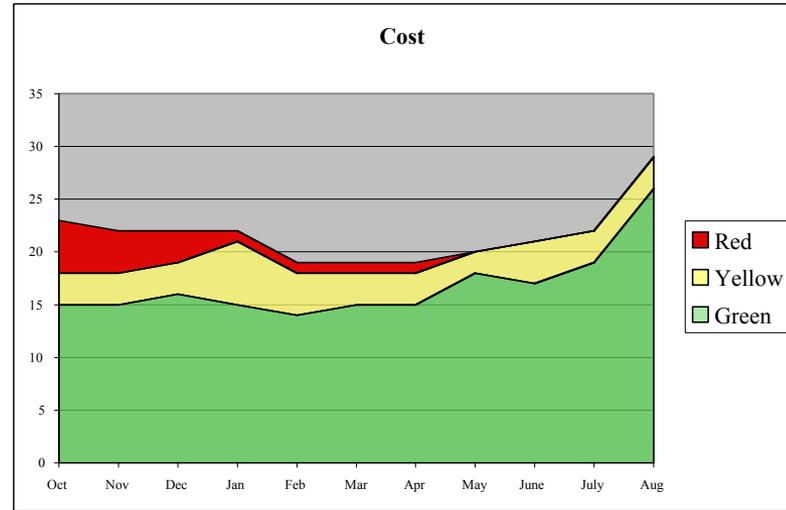
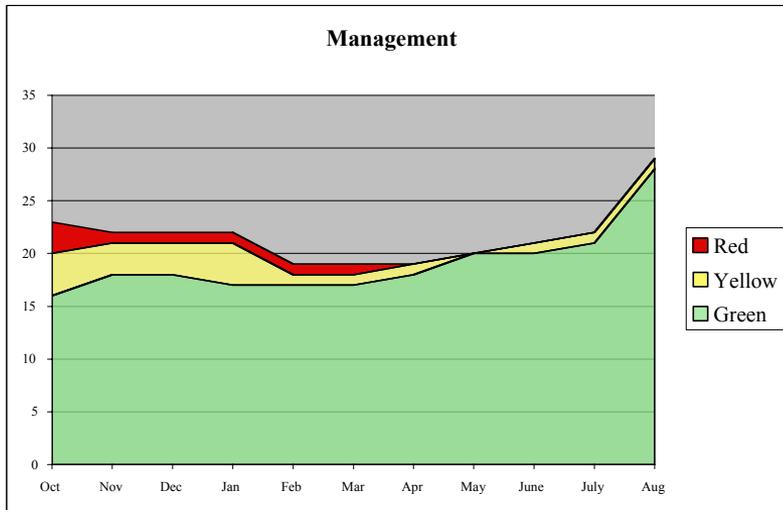
# Process Performance and Product Conformity

Richard Gladwin



## Process Performance and Product Conformity – Richard Gladwin/ VS10

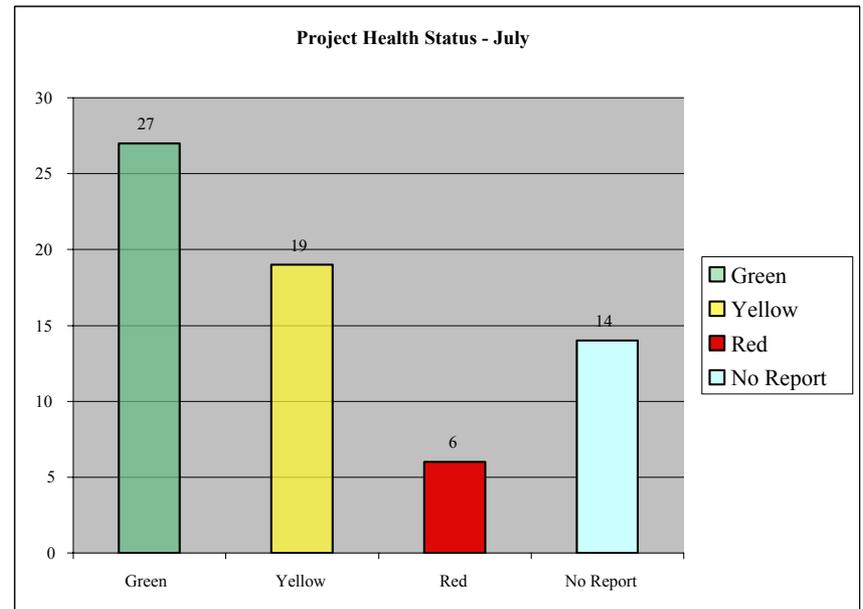
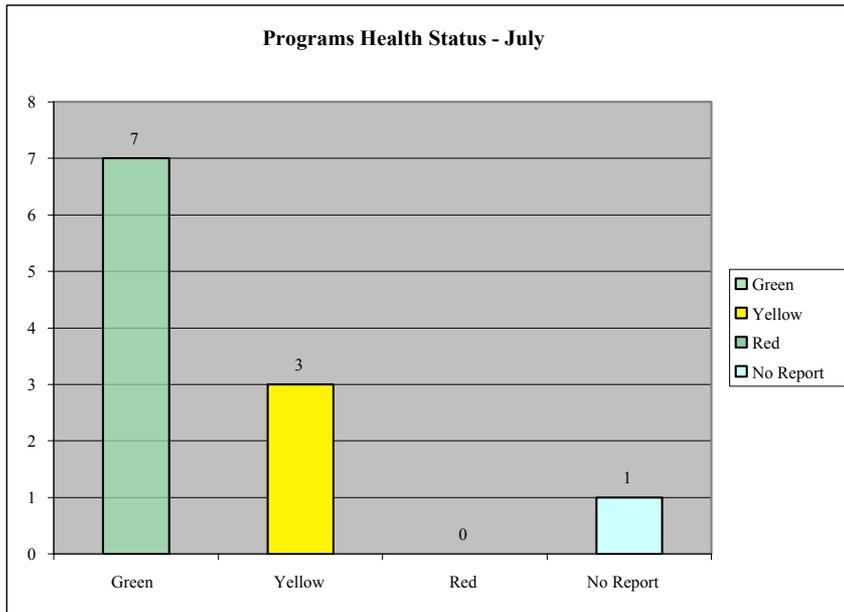
### Oct 2001 - Aug 2002 Executive Summaries





Process Performance and Product Conformity – Richard Gladwin/ VS10

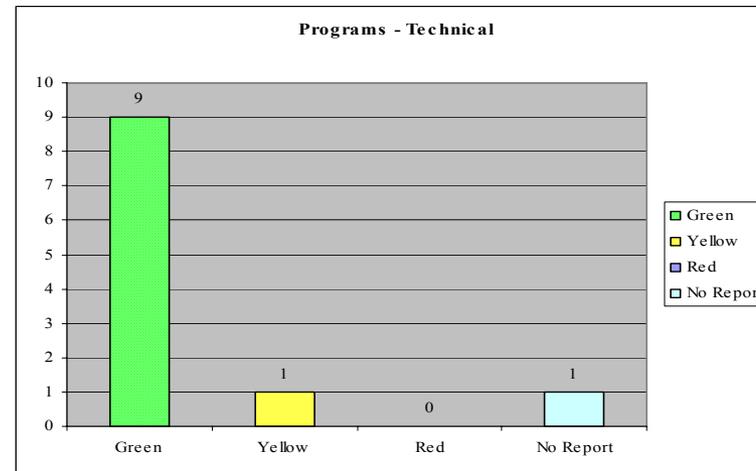
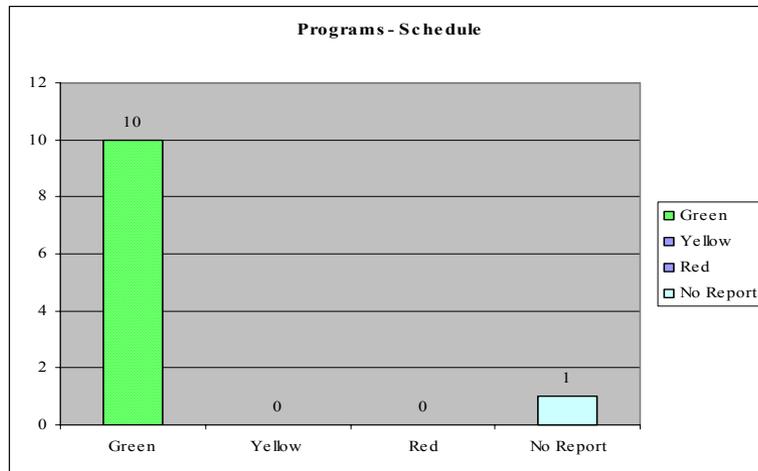
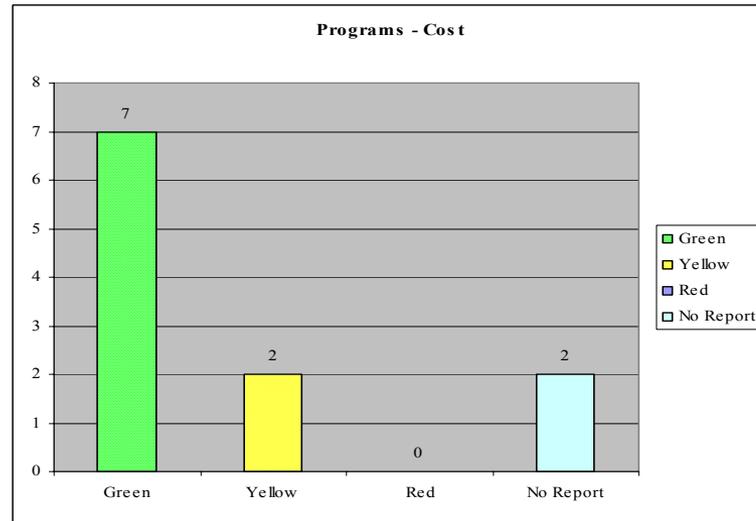
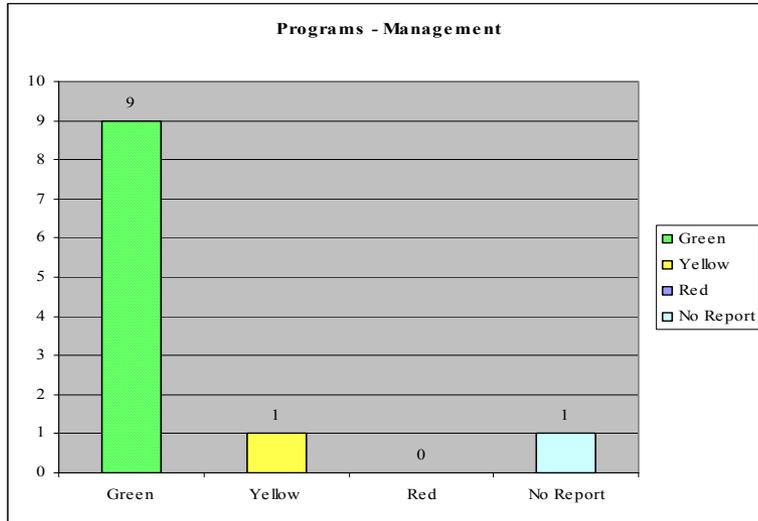
### # of Programs/Projects Reporting Red/Yellow/Green





## Process Performance and Product Conformity – Richard Gladwin/ VS10

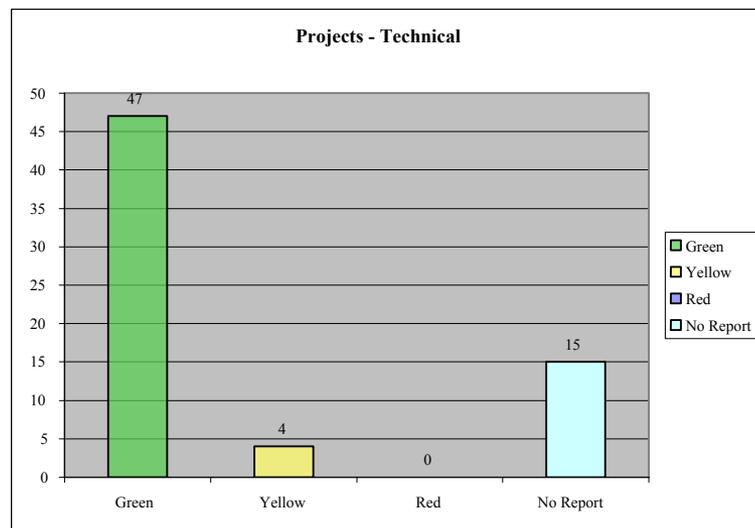
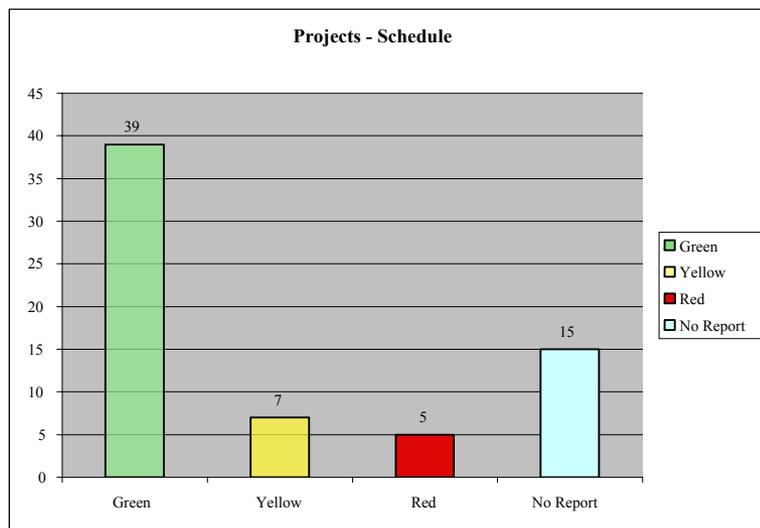
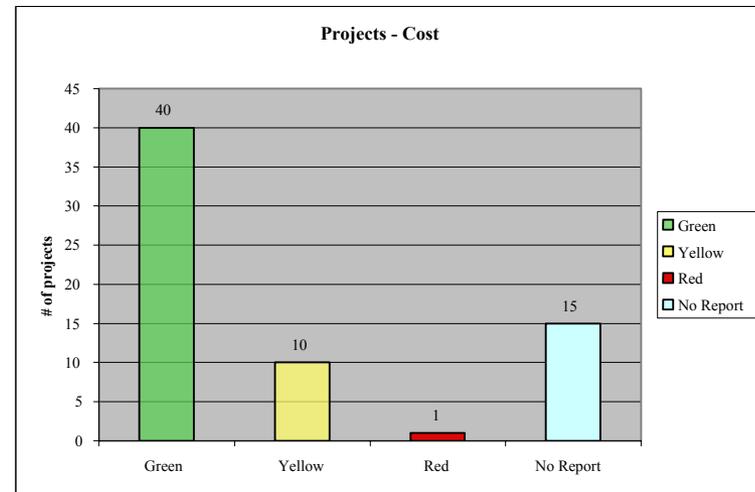
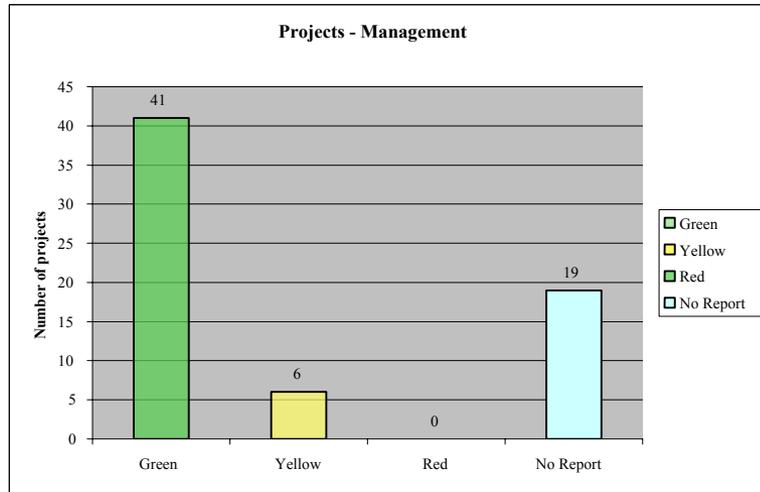
### Program Data for July 2002





## Process Performance and Product Conformity – Richard Gladwin/ VS10

### Project Data for July 2002





Process Performance and Product Conformity – Richard Gladwin/ VS10

## *NASA Stoplight Criteria*

- Green represents *Progress according to Plan*
  - Meeting management plans\* or commitments.
  - No action required.
- Yellow represents an *Area of concern\*\**
  - Deviating from plans\* or commitments, but approved contingency/reserves exists to recover and successfully complete the program/project as approved.
  - Needs attention. Problem can be resolved within the reporting organization.
- Red represents a *Significant problem\*\**
  - Deviating from plans\* or commitments, with insufficient approved contingency/reserves to recover and successfully complete the program/project as approved.
  - Needs action. Help required beyond the reporting organization to address the problem.

\* In Implementation, the appropriate document is the approved program/project plan. If used in Formulation, report against appropriate approval document (e.g. FAD or equivalent).

\*\* Any “Yellow” or “Red” assessment requires a brief explanation of the problem and an action plan.



Process Performance and Product Conformity – Richard Gladwin/ VS10

- 188 Directives
- 4 active Waivers against 3 Directives
  - MPG 5000.1 - Purchasing - 1 Waiver
  - MWI 5113.1 – Credit Card Operating Procedures – 2 Waivers
    - *Rules for use of credit cards to purchase flight hardware have been revised to allow off-the-shelf flight hardware purchases using Government Purchase Cards, as long as any quality requirements are documented by a QA Representative prior to the order being placed by the Project. The existing waivers are still required.*
  - MWI 7120.6 - Program/Project Risk Management - 1 Waiver
- The documented system appears to be adequate.



# Internal Quality Audit Report

Warren Woods



Internal Quality Audit Report – Warren Woods/QS40

- Completed three internal audits since the last MQC
  - Resident Office at Stennis and the SD and CD organizations
- The draft 2003 internal audit schedule is out for review
- Fifteen internal audits are planned for 2003
- Others may be required



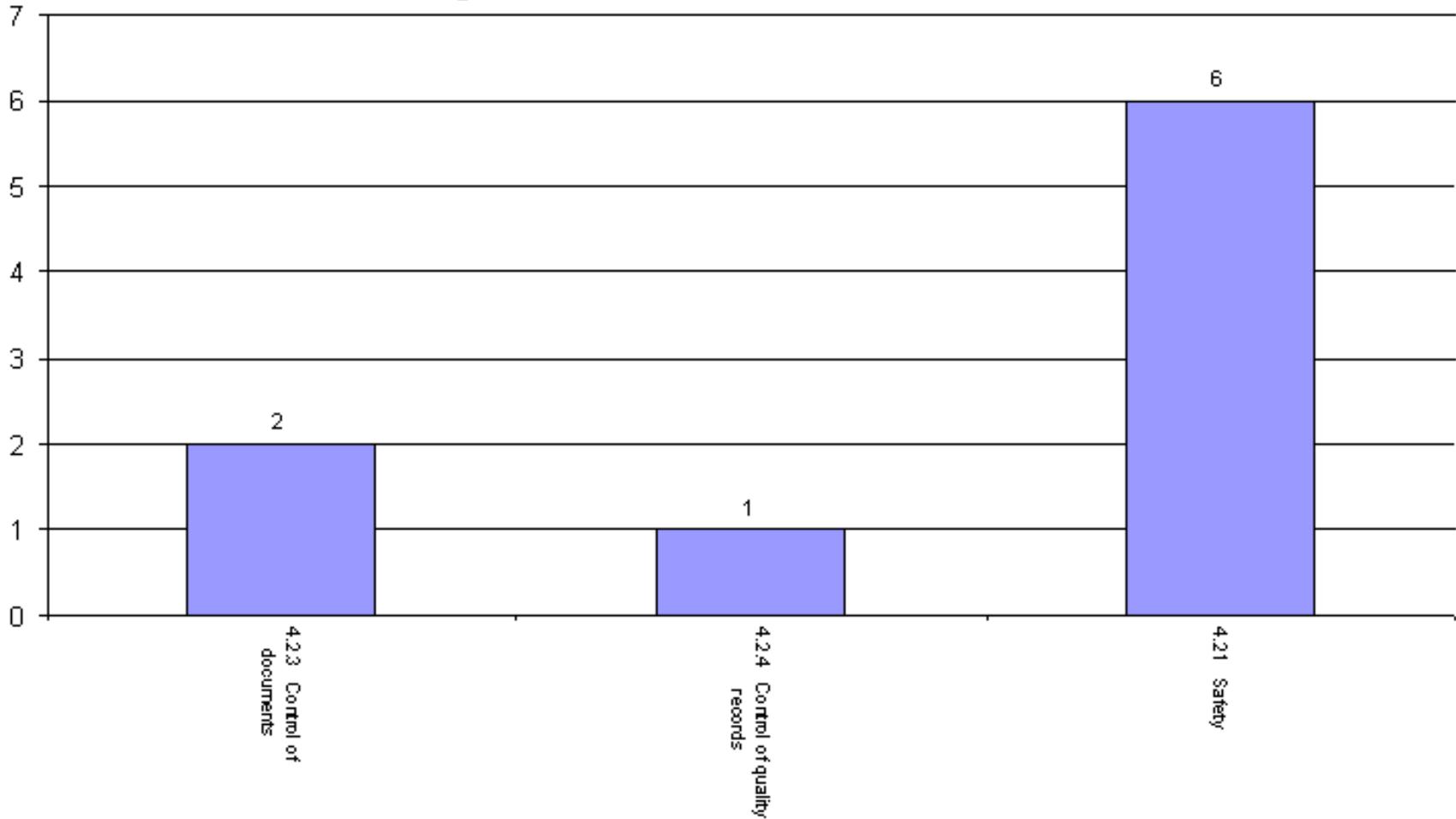
- Top Four Findings

- Safety issues
- Document and Data Control – References not kept up-to-date or obsolete
- Quality Records – Lack records plans
- Lack of awareness of quality objectives



Internal Quality Audit Report – Warren Woods/QS40

### Total Major and Minor Nonconformances





- Status of Open NCRs
  - 38 Open Nonconformance Reports (NCRs)
  - 2 are late as of 10/10/02
  
- Schedule
  - Remaining audits include the audit of FD and AD
  - All audits should be completed before  
Thanksgiving

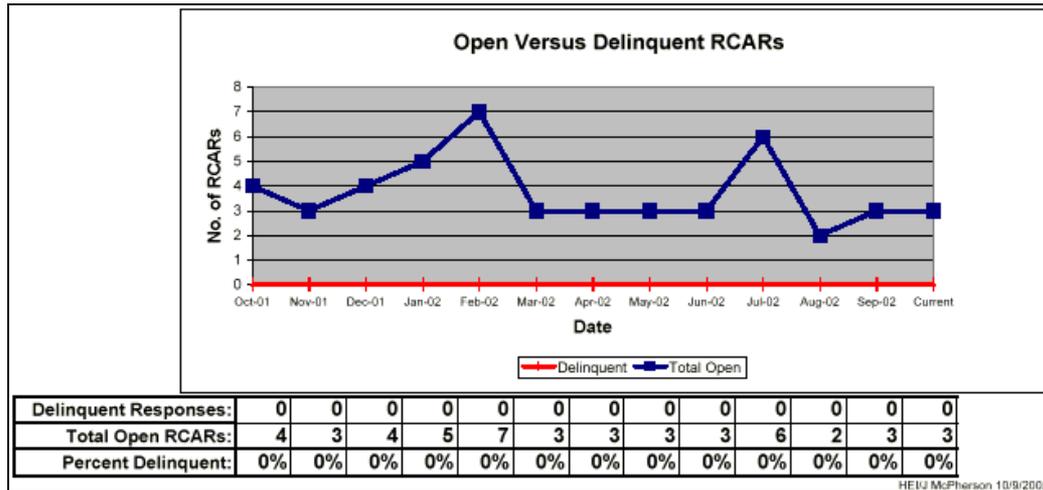
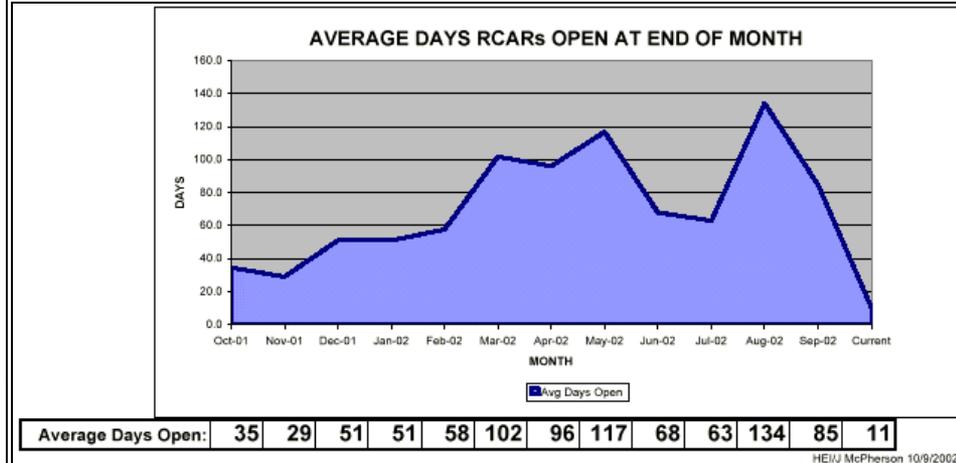
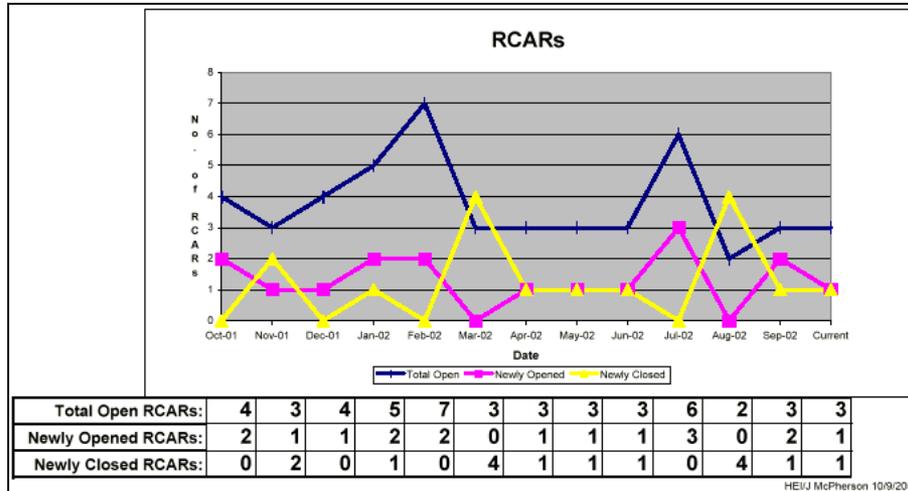


# Corrective & Preventive Action Program

John McPherson



## Corrective & Preventive Action Program – John McPherson/ HEI



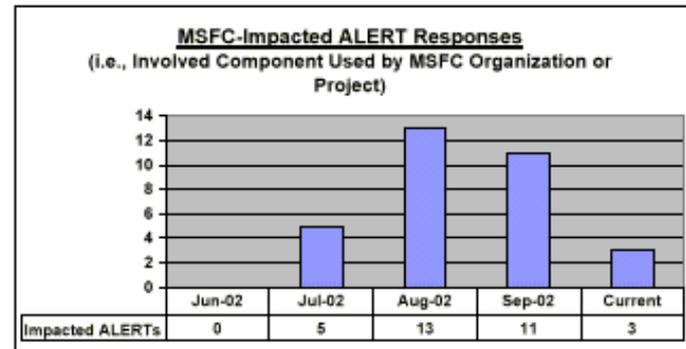
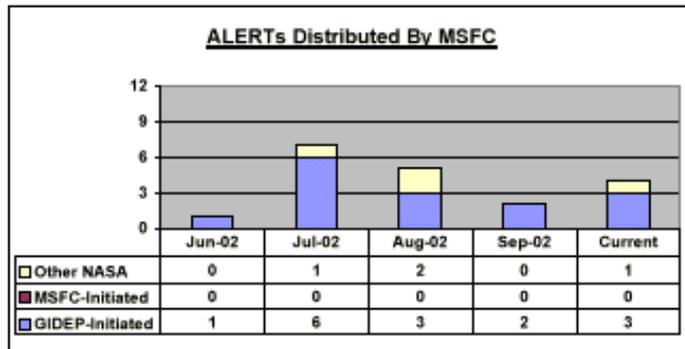
	TOTAL Since 10/97	Made to RCARs	TOTAL Since 06/19/02	Made to RCARs
DR	436	56	54	5
QSDN	113	75	2	1
Cust Fdbk	130	1	14	0
<b>TOTAL</b>	<b>679</b>	<b>132</b>	<b>70</b>	<b>6</b>

HEI/J McPherson 10/09/02



## Preventive Action Program – John McPherson/ HEI Corrective/Preventive Action Notifications (CANs) – NONE Issued

### GIDEP and NASA ALERTs and Parts Advisories



#### MSFC-Impacted ALERTs

G6-S-02-01	200-TON RAILCAR, BED, CENTER PLATE DESIGN, WELD, AND INSPECTION	RSRM Thiokol, Solar-B LMMSS
NA-JSC-2002-01	CONTACTS, ELECTRICAL, PWER, CRIMP STYLE REAR REMOVABLE, SOCKET SIZE 22D CO	Solar-B LMMSS
F3-A-02-02	WELDING, ELECTRON BEAM, PER SAE-AMS2680	ED30
NA-GSFC-2002-02	SINGLE EVENT INDUCED TRANSIENTS IN LINEAR TECHNOLOGY MICROCIRCUITS	ED30; g-LIMIT; MGM U_of_Colorado; SSME Rocketdyne/BNA
NA-GSFC-2001-02	HANDLING, ASSEMBLY AND ESD SENSITIVITY OF 1N5711 AND 1N5712 TYPE DIODES	Solar-B LMMSS; SSME Rocketdyne/BNA
NA-MSFC-2002-01	MP 35 N MATERIAL - MIXED MATERIAL, BOLT, SHEAR, HIGH STRENGTH	ED30; SSME Rocketdyne/BNA
VV-P-02-02	DIODES, POWER RECTIFIERS, STANDARD & FAST RECOVERY, AXIAL & SURFACE MOUNT	Solar-B LMMSS
NA-JSC-2002-01	CONTACTS, ELECTRICAL, POWER, CRIMP STYLE REAR REMOVABLE, SOCKET SIZE 22D CO	Solar-B LMMSS

#### MSFC-Impacted ALERTs (continued)

NA-MSFC-00-003	LOCKHEED MARTIN STM E300 (CABLE, ELECTRICAL, TFE INSULATED, 260o C)	SSME Rocketdyne/BNA
AAN-U-00-11	TIN PLATING, WHISKER GROWTH	Solar-B LMMSS; SSME Rocketdyne/BNA
MT2-P-00-01	MICROCIRCUIT, HYBRID, DC/DC CONVERTER	Solar-B LMMSS
VV-P-00-06	SEMICONDUCTOR DEVICE, TRANSISTOR, NPN, SILICON, SWITCHING	SSME Rocketdyne/BNA
AAN-U-00-26	NOTICE OF SUSPECTED NON-CONFORMING FASTENERS	Solar-B LMMSS; SSME Rocketdyne/BNA
H1-P-00-01	ELECTROSTATIC DISCHARGE (ESD) PACKAGING PROBLEM WITH RESISTORS	Solar-B LMMSS; SSME Rocketdyne/BNA
MT2-P-01-01	MICROCIRCUIT, HYBRID, DC/DC CONVERTER	Solar-B LMMSS
F1-P-02-01	CONNECTOR (CONNECTOR SAVER); GLENAIR, INC	SSME Rocketdyne/BNA



**Major MSFC ALERT Activities**

- **Located for expedited procurement a custom thermistor to avoid delays in launch of Gravity Probe-B**
- **Implemented additional access security to MSFC ALERT Data System per revised NASA requirements**
- **Issued first Open Delinquent Response Tabulation using MSFC ALERT Data System, resulting in reduction of delinquent ALERT responses**

**June 30, 2002 Delinquent Responses**

<b>All MSFC Programs:</b>	<b>4,722</b>
2GenRLV:	232
Flight Projects:	691
MSFC Admin:	0
Science:	3,085
Shuttle:	0
Space Transportation:	714

**September 30, 2002 Delinquent Responses**

<b>All MSFC Programs:</b>	<b>3,183</b>
2GenRLV:	252
Flight Projects:	685
MSFC Admin:	0
Science:	1,827
Shuttle:	0
Space Transportation:	419



# Status of NQA May 2002 Surveillance Audit Findings

Mary DeMurray



- NQA Surveillance Audit Findings

Observations (1 Carry-Over)	2
Minor Nonconformances	9
	<hr/>
Total Findings	11

- Generated 13 NCRs from the 11 findings.
  - Completed – 6
  - Late/New Target Dates – 6
  - Not Due Yet - 1



# Closing Remarks

Axel Roth



- Next Surveillance Audit November 5-6, 2002
- All MSFC activities are subject to audit
- Emphasis will be on activities providing products/services to external customers
- Self-Assessment Checklists will be provided on the ISO web site for reference



ISO 9001 Clauses Selected for November Surveillance Audit – Axel Roth/ DE01

4.2.1/4.2.2	Quality Manual
4.2.4	Control of Quality Records
5.4.1	Quality Objectives
5.6	Management Review
7.1	Planning of Product Realization
7.2	Customer-related Processes (including Communication)
7.3	Design and Development

7.5.1/ 7.5.3	Control of Production & Service Provision/ Identification & Traceability
8.2.1	Customer Satisfaction
8.2.2	Internal Audit
8.3	Control of Nonconforming Product
8.5.1	Continual Improvement
8.5.2/ 8.5.3	Corrective/Preventive Action

Notes: Control of Documents will be included as it pertains to the selected clauses.



Signifies clauses that will be reviewed each visit



Changes That Could Affect the MMS, Issues & Recommendations - Axel Roth/ DE01

- Changes That Could Affect the MMS
  - IFMP
  - There are no other significant changes at this time
- Issues & Recommendations
  - Organizations need to continue educating individuals on their role(s) in supporting quality objectives
  - Recommend everyone visit the ISO web site
  - Organizations need to complete implementation of their Customer Satisfaction systems



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Overall Status of the Marshall Management System – Axel Roth/ DE01

- Overall, the suitability, effectiveness, and adequacy of the Marshall Management System (MMS) appear to be acceptable
  - Internal and external audits indicate no major problems with the MMS
  - No waivers have been requested since the last MQC
  - Customer Satisfaction indicators are positive overall