

**NQA Triennial Audit of MSFC
“Scribe” Notes on the February 6 - 8 2001**

Interview with the MSFC Management Representative:

N: What is your title?

A: Associate Director, MSFC

N: (In reviewing MPD 1280.1) What is DA01 and MPG stand for?

A: DA01 is an organizational code for the Office of Primary Responsibility for this document. DA01 is the code for the Center Director’s Office. MPG is an abbreviation for Marshall Procedures and Guidelines.

N: What is the Management Review Meetings frequency?

A: Minimum of two meetings per year.

N: What is MSFC’s Quality Policy?

A: To provide quality products and services to our customers.

N: Have you experienced a change in resources lately?

A: There have been a small number of persons retiring, but not much change in workforce numbers. There were no “buyouts” authorized last year and there will be none this year.

N: Have there been any changes in top management lately?

A: MSFC had a major reorganization in mid-1999. Much of the engineering support that was formally located in a separate organization (Science & Engineering) that supported projects was moved into the project Directorates. Within the past six months, another Associate Director position has been created, also a staff expert support position for Optics as well as an expert staff support position for Propulsion. Also, the Deputy Center Director retired in December 2000 and the former director of the Engineering Directorate has filled that position.

N: (Reviewing the December 2000 Quality Council minutes) Was the “computer back-up procedure problem” closed?

A: Yes. Last week. Objective evidence is available.

N: What is a Recurrence Controlled Action Request (RCAR)?

A: Every employee can submit a RCAR for any perceived problem – this is the form used for the Corrective Action System – and submit electronically.

N: What is the reference in the minutes about the next review (NQA audit) covering statistical techniques?

A: That was an error. It was reported in the meeting, but was discussed to be in error, that the NQA audit would not cover statistical techniques.

N: What are the bold names in the attendance list?

A: The bold names are office heads.

N: Who is supposed to attend these meetings (Quality Council)?

A: This is defined in the Council Charter. The Center Director or the Deputy Center Director's attendance is required for a meeting. Department heads or their representatives should also be in attendance.

N: (to escort) What is your title?

A: Senior Quality Engineer, and unofficially, ISO consultant.

N: What is Overhead Training?

A: Kinds of training that everyone has to take that is not specifically job related, such as Safety, ISO, IT Security, etc.

N: Now let me see the minutes from three years ago (Quality Council Meeting).

A: (Provided minutes from November, 1997 meeting.)

N: How do you work action items? Do you assign action items?

A: Actions are assigned in one meeting and the closure (or status) is reported (and documented) in the next meeting. All actions are statused in each meeting.

N: Request 1998 minutes.

A: Minutes provided.

N: I see actions and dates, but not closure.

A: That was a previous NQA finding. It was an early problem. Now actions and closures are consistently handled.

N: I would like to see the NQA report when that finding (inconsistent action closure documentation) was identified.

A: (Looking for archive NQA reports on the web) “Registration Audit, Feb. ’98: Found problem with action item status in Jan. ’98 and Feb. ’98 Quality Council reports.” Action item status (listed in Quality Council reports) should be much clearer after that time.

N: Request ’99 minutes.

A: Minutes provided.

N: Was there a finding due to NCR’s being open too long?

A: No. This was an internal finding. No process was in place to determine a reasonable time required for closure.

N: Do you discuss the Quality System in each meeting?

A: Yes. The System is discussed in each meeting, problems that we are having, etc.

N: You don’t have improvements discussed?

A: We don’t have a separate section of the meeting titled, “Improvements,” but improvements are discussed in each meeting in the form of problems that have been encountered with the Quality System and the resolution required (which are improvements).

N: Did you expand the scope to include the entire Center?

A: Full scope was discussed at that time (April ’99) but it was decided to delay full scope until the reorganization was better in place and functioning. NQA full-scope review is now scheduled for August 2001.

N: Please provide the Feb. 2000 minutes.

A: Minutes provided.

N: (comment) You can almost see continuous improvement in minute’s quality. They get to looking better & better (with time).

A: N/A

N: How are the different NASA Centers connected/managed?

A: Center management is broken into Enterprises:

Space Science – Goddard & JPL

Earth Science – Goddard

HEADS – MSFC, JSC, KSC, & Stennis
Code R – Ames, Glenn, & Dryden

MSFC is the Center of Excellence for the development of Space Transportation, Microgravity Science, and Optics Manufacturing. The primary MSFC mission is associated with Shuttle support and RLV's (Reusable Launch Vehicles)

(A copy of the MSFC 2001 Implementation Plan was provided to the NQA auditor that provides more detail information on the MSFC mission.)

Interview with project representatives to determine if their project would be an Audit candidate:

N: What is your project?

A: ProSeds

N: Tell me about it.

A: It is a small flight project that will fly on a Delta rocket. Some hardware has been developed, some is currently in work. Some hardware is designed here and universities and small companies develop some.

N: Do you have design data (here) from subcontractors/subsystem suppliers?

A: Yes.

N: When were test plans developed?

A: We have a Verification Requirements document that includes the test requirements.

N: How do you handle design changes?

A: CCBD (Configuration Control Board Directives) for review and approval. There is a process for design change control.

N: Documented?

A: Yes. This process is documented and maintained by Configuration Management.

N: Do you follow the procedures?

A: Yes. 7120.5 for PM & 8060.1 for design control changes.

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N: What is your job title?

A: I am the Audit Manager.

N: What is the Quality Policy?

A: "Provide quality products and services to our customers."

N: Who is the Management Rep.?

A: Sid Saucier

N: I want to see all the internal audits done this year. I want to look at the findings from the past 3 years.

A: Documents provided.

N: I want to review your process document on audits, making sure it is the last revision.

A: MPG, Revision B, provided. Reviewed by Auditor.

N: What is the audit plan?

A: Audit plan is created for each audit, tells which elements will be audited and the people on the audit team.

N: Can you tell where the people on the audit teams work?

A: Yes. I have their organization codes.

N: Do you keep in mind auditor independence?

A: Absolutely. If someone left an organization under duress, they couldn't audit that area.

N: Do you use escorts in internal audits, too?

A: Most of the time. Sometimes we leave that to auditor/organization discretion. For most of the management interviews, we use escorts.

N: I want to see the audit schedule.

A: This year's (2001) schedule provided. Noted that previous years are available.

N: I want to see a previous year.

A: Provided last year's (2000) schedule.

N: Are you letting some organizations go over a year before auditing?

A: No. We changed our audit cycle after NQA suggested that we run from Jan to Dec. Our procedure says "yearly".

N: Examples given look ok. I had the charts (schedules) reversed.

N: What do the asterisks on the schedule mean?

A: That signifies one audit involving 4 organizations.

N: Let's see the last batch of internal audits you did.

A: That would be the 2000 audits. Do you want to see them all or just some?

N: What about the report for the last audit (4 organizations)?

A: That audit was just completed last Friday.

N: Let's see that one.

A: Draft report printed from database.

N: Do you have the auditor training records here?

A: Official records are maintained by the Training Office. I have copies here.

N: I want to see last year's audits, Sept – Dec.

A: Reports provided. (Looked at CD audit for year 2000).

N: Observation means it's ok?

A: Yes. We saw it, noted the occurrence and that it's ok. Observed concern means that maybe we should go back and take a look.

N: Do you have a separate document with questions and elements they were supposed to look at?

A: Yes. (Printed document). Some of our departments are basically administrative. Not every element applies to every organization. You are

looking at an audit plan with minimum requirements, few elements to be reviewed, and some auditors were under instruction. Elements could be different for each organization.

N: What about another report for 2000, (TD)?

A: Report printed from database. You will see some unfamiliar elements there – pertaining to Safety and Environmental Health.

N: What is a finding vs. an observation in this report?

A: Our database classifies these as observations, observed concerns, and major/minor nonconformance's.

N: Ok, let's see one before this.

A: Provided FD audit for 2000.

N: I want to see a report with elements 14 and 15.

A: Most likely, those will be in the QS audit. Provided last year's audit report. Traced from last year's audit schedule.

N: Do the findings become NCR's? Could I see the list of NCR's?

A: Yes. List printed from database.

N: I want to see the previous FD audit.

A: Provided report.

N: Let's see training records for some of these auditors. (ex, picked two Auditors)

A: Ok. ?????? is one of the safety experts. I have auditors, lead auditors, experts.

N: Where does ?????????? work?

A: I can look that up. According to the database, ?????????? works in ED.

N: Ok. Let's look at ?????????? ???????, too.

A: Auditor history printed from database. Need to check with ?????????? to get training records on ?????????? and ??????????. They were trained before the ISO database was set up.

N: What about ??????????

A: We will get her training record from the Training Office. (Call made to Training Officer to request these records).

N: Did you ever correct the problem noted in this report – regarding the audit schedule?

A: No. I didn't. We did not go back and audit the organization again (BC) because they had already been audited once that year. This happened when we changed our audit cycle.

N: What is the QSDN system:

A: "Quality System Deficiency Notice." Available to anybody on the Center – civil service or contractor. QSDN goes to me and if not resolved here, goes to Associate Director. People can report problems with our system without going to their supervisor.

N: What about the NCR's?

A: I'm printing the list, and we'll let you go down the list and take a look at them. You can scroll them on the screen, as well.

N: Oh, gee – are they not separated by element?

A: No. Might be good to have, but not one of our database capabilities right now.

N: Are these all from internal audits?

A: Yes.

N: Scrolling the list, what does "agreed" mean?

A: Lead auditor agrees to corrective action as proposed by the organization.

N: What does official mean?

A: Audit manager has approved the NCR, but organization hasn't said what they will do to correct the problem.

N: Viewed 97/98 NCR's.

A: Should see a progression in the quality of NCR's written.

N: Can we tell the audit number?

A: No. At that time, there were no audit numbers. That came later, as we refined our system.

N: Where are the last 4 internal audits you've done?

A: AD, ED, MP, TD were last 4 from last year. (Audit manager explained the various sections of our NCR write-up).

N: Do you have a masterlist?

A: Yes. Center level masterlist. (Showed Center org. chart). Each org has their own masterlist. Hard to keep all in sync if someone updates their documents and the updates don't flow into all applicable documents.

N: Let's see that list you have showing how many times you have written NCR's against various elements.

A: Ok. I generated this chart for the last MQC meeting.

N: Why so much on safety?

A: Well, it's the Center's #1 priority. We spend a lot of time on safety. We reviewed all our safety documents and found some holes in our program.

N: Why all the hits on ED concerning metrology?

A: The old EB organization had around 25,000 pieces of equipment, and only 6 property custodians. Our team tried not to hit them too hard, but we needed to get the problems fixed.

N: Do you run two shifts or one?

A: Basically, one. Only the Space Station folks run two shifts when Space Station is manned with science experiments.

N: Why don't we look at the previous NQA reports, starting from '98?

A: Provided reports. Reviewed, particularly the last page of reports.

N: Find last page of '99 report, let's compare. What did he write up on 4.17?

A: Viewed write up. (Checked 3 previous reports for write up on element 4.17).

We had one carryover from a previous audit. On the last audit, we had no findings against the internal audit program.

N: How did you fix the problem on 4.17?

A: Mary will show you that back in room 1201.

N: Don't you have all the NCR's online?

A: Not the NQA NCR's, just internal ones.

N: If a problem/element doesn't get covered in an organization's audit, do you reschedule the audit for that year?

A: No, generally not. Only minor issues usually get carried forward to the next year.

N: What if it is an element where you get a lot of hits?

A: No. We can't let it go if we have signs of a bigger problem. Example, Document and Data Control – we get a lot of hits on 4.5. Can't let that go.

N: What type of problems would you have with quality records other than records retention?

A: Some organizations have established records retention times and have let the retention dates slip by.

N: What does your procedure read on record retention?

A: Showed auditor some record folders with our retention requirement on the folders.

N: How do you destroy records? How often is warehouse cleaned out?

A: My procedure doesn't address that.

N: Let's see your master list of quality records.

A: MPG viewed.

N: Where are the audit checklists?

A: Started as a separate document, now has migrated into the audit report document. Kept in separate files. Now stacked on top of file in audit manager's office. Not in official audit report folders. Auditor saw a group of checklists from previous audits.

N: Let's compare the audit report (SD) to the handwritten checklists we're looking at.

A: Ok. Reviewed report and checklists. Explained that auditors are non-professionals and depend on audit manager to help decide what is really a nonconformance.

N: Ok. So the notes are not much value after the report is written.

A: No. Notes might have been written over several days, might ask the auditor to go back and get more information after the notes are written but before the report is published.

N: Do the auditors know what to look for before each audit?

A: Absolutely. We review the checklists with the auditors prior to starting the audit.

N: I see only one question in the TD audit report concerning purchasing. Did the auditor only ask one question?

A: Not necessarily. I review with auditors prior to the audits and ask them to highlight certain areas.

Conclusion:

N: Really no concerns. Looked pretty good.

Observation – might destroy audit notes after report is typed. Might have master audit checklists shown to auditors before each audit.

A: We do that. We use standard ISO checklists. Also tried checklists for all our MSFC documents, but that became an administrative nightmare for the audit manager, trying to keep them updated.

N: What is your title?

A: Management Analyst. Directives/Documentation Controller

N: What do you do?

A: Control hard copies of Marshall Directives and other Marshall Policies, schedule meetings,
Keep minutes, etc...

N: I would like to see signed copies of quality records. Some I looked at earlier were not signed.

Looked at MPD 1280.1 Rev F – Marshall Management Manual.

A: Auditee showed hard copy of the document to the auditor.

N: Who signs these manuals?

A: Sid Saucier

N: Auditor looked at MPG 1280.6 Rev B – Internal Quality Audits

N: Where does the 1280 classification (and other classifications) come from?

A: Auditee showed a link to NASA Agencywide directives list. Auditee stated that MSFC follows the number systems and guidelines as defined at the agency level.

N: What about the 1270 manuals (TQM) ? Do you have any of those?

A: No we do not. Other centers may use them, but MSFC does not.

N: Does the Center Director know who his signature designees are?

A: Yes. Only people in DA, DD, and DE can sign for the Center Director.

N: Can I see Document ED14-SS-001, Software Development Process Description Document?

A: Stated that she does not control that document, but that she could access it online. Auditee was unfamiliar with procedure to get that document from the server (NOT her fault). Fortunately, the Scribe was from the organization responsible for the server where the document resides, and was able to open document for the auditor.

N: Can you show me the MSFC Flight Software LifeCycle Process Document?

A: I am not familiar with that document. It is controlled by another organization.

N: How do you make changes to documents? Ex MPG 8060.1 Rev B

A: Auditee showed auditor the process for doing this. Changes are kept in the archives. Red = new text, blue = delete.

N: Looked at marked up document. Can I see paragraph 3.2 to see if it really got deleted?

A: Auditee showed that paragraph to the auditor.

N: Can I see MPG 7120 Rev B – Program/Project Planning? I would like to see revision number and see it that is the latest version available online.

A: Auditee showed auditor the latest version online. It was the same as the copy on file.

N: Can I see the list of MSFC OWI's?

A: Auditee showed auditor the list from online.

N: Are there OWI's for project planning?

A: Yes. Auditee found that document online.

N: What is the latest Revision number? What was it revised?

A: Auditee stated latest Rev number. It was last revised because of the MSFC reorganization.

N: Auditor looked through Masterlist on his own.

N: What does MPG stand for?

A: Marshall Procedures and Guidelines.

N: Do you know the MSFC Quality Policy?

A: To provide quality products and services to our customer.

N: Who is MSFC's ISO Management Representative?

A: Sid Saucier

N: What are the corporate directives?

A: Auditee showed auditor the list online.

N: Which directives concern you?

A: The agencywide and MSFC directives.

Note: Remaining time was spent discussing planning for the new ISO standard with ISO Representatives.

Auditor looked at related documents and discussed training plans.

N You were going to show me the monthly reviews
A Yes, I have a dozen plus reviews here....(gets notebook and explains documentation).

N Asks questions about the program schedule
A Answers and explains requirement document

N What does FRR mean?
A Flight Readiness Review and it will occur in May. We keep the latest schedule on the web. I got an exemption from the last review that was held.

N Did you get a written exemption?
A Yes, I got an email.

N May I see that email? Do you have a software systems review on this project, and what process do they follow?
A Yes. (Shows him the exemption email and the software CDR documentation).

N Can I see your software requirements documentation?
A Yes, I can get it off the web. It also has an action item tracking system on it.

N Did you have the 3rd phase review yet?
A Yes, but I don't have it filed yet.

N What were the actions that came out of this meeting?
A They're all posted on the web; I can show them to you.

N Where did this requirement come from?
A Explains the requirements process.

N How do you know that these will meet the requirements?
A We have testing/evaluation of the software systems before it goes to hardware development.

N How do you track all of the actions each day?
A Explains the action items process.

N Who gets the action item?
A They are assigned to individuals during review meetings.

N Do you approve the actions when they are closed?
A Yes

N Looking at document DA-01 MPG 8060.1 (He asks for explanation of how the ProSEDS project complies to the document).
A Explains the ProSEDS document control process.

N I still would like to see the minutes of the review. The MPG document is vague on how to handle “output of the meeting”. Other than that, you are doing just fine. Thank you for your time.

A Explains the overall project

N Asks to see the quality records.
A Shows him the technical review documentation and explains the process.
Introduced him to records custodian (a contractor working for CST). She did not know the quality policy because she has only been working at MSFC for 3 weeks.

N Asks about the PDR meeting on 4/19/99.
A Shows him the documentation, attendance, and presentations.

N What was the output of this meeting?
A We don’t take minutes of the Kickoff meeting because they just present their charts. We do have Pre-Board minutes, which is after the RID process. (Showed him the minutes.)

N Explain the difference between the Kick-off meeting of the PDR and the Pre-Board.
A Explains the entire process.

N Thank you, I’ve seen enough. You guys are doing a good job here.

N: You weren't on the schedule, but from the last audit we identified a schedule problem (?) that I wanted to follow up on.

(NOTE: It seemed that neither the auditor nor auditee could really identify the problem we were there to discuss).

A: We use the "waterfall" system, as the Center uses. OWI provided.

Most responses given during this interview were from the Lead Software Engineer, with some assistance from Mr. Crumbley.

N: When are test procedures written?

A: Normally between CDR and completion of coding cycle.

N: Can you run me thru one piece of a project so I can follow it thru?

A: Yes. We have a software development plan for each project (in-house). There is traceability between software requirements and design requirements, requirements reviews, i.e., PDR, RR, TRR, and sometimes and Interim Design Review (IDR).

N: Where are the reviews in the cycle?

A: Those are maintained by the project offices.

N: Do you have a process flow?

A: Yes, in OWI ED14-SS-00 (F), Figure 3.0-2. Explanation was given concerning requirements documents for the Urine Processor Assembly (UPA) project.

N: Distinguish software from firmware.

A: Explanation given.

N: What about testing/design of firmware/software?

A: We do application development, not really firmware. Can be modified on the ground. Not hardware, not operating system.

N: Can you run me thru the requirements based on the documentation?

A: Explanation given of UPA requirements. All documentation was not available, mainly because of volume.

N: Can you trace me thru a piece of the requirements document?

A: Organization chart shown for the entire team. Process flow shown for the "1553" interface, flowed from the requirements document.

N: How is IPNCL written?

A: That is a separate document, iterative development process between the software team and the UPA design team. MSFC Flight Software Life Cycle board chart shown and used in explanation. Printed for the auditor.

N: When is the test plan done?

A: That was completed at the end of last year. It's done at the same time as PDR, along with requirements. Explanation was given of the metrics chart updated monthly to show the status on projects.

N: We haven't got time today. Maybe later you can walk me thru all the requirements documents, signed reviews, etc.

A: Sure. Be glad to.