



N Then it comes to you?

A Yes, it comes to us. QA annotates functional test to be performed. Functional test comes with wide variety of functions.

N Who sets parameters?

A Procuring engineer, discretion of project office - as to what tests on piece parts. We have established test procedures for piece parts on a routine basis, e.g. resistors. I generate a procedure to verify component basically works.

N Sampling?

A No, 100%. If we get 1000 resistors, we test all.

N You said if routine you have test procedures. What if not routine?

A We talk with project office - determine and check Mil Specs, and evaluate what we can do. If we can't do it, we generate a new procedure with QA, and project office as to what we can do. We TCP.

N What is TCP?

A TCP- Test and checkout procedure, more in-depth than TPS  
TPS - Test Prep Sheet - a quick and dirty test  
We try to test to TCP if possible, if not TPS

N How many people in this department?

A Myself, one sub-contractor, and one civil service support

N When routine parts - test procedure. How do you determine routine?

A history

N Is that in a file?

A Let me go through a scenario.(uses example from incoming table)  
A router line item tells EL62 to test per XXXXXX. We require a customer agreement/ task agreement between each project office and EL62. Task agreement does not specify requirements. We have created a new form(customer agreement) lower level than Task Agreement where requirements are specified.

N Do you do cable assembly here?

A They come from EH. Electrical piece parts can be routed through here.

N Is there a procedure that governs the work?  
A yes

N Can I see it?  
A (leaves to get procedure). Returns and shows a copy for capacitors.

N What about the drawing?  
A Work instructions tell to put out package and test per notes.

N This is more of a level 3. I want to see a level 2 document.(MM4000.1 referenced)  
A That governs S&MA process. This is a part...

N I want a document that gives you instructions as to what to do.  
A This is level 4. EL01 governs how to write level 4 and OWI. Let me show you. ( shows OWI and discusses - tells how to write TCP, TPS)

N I am looking for a step up from here.  
A MSPs are level 2. I go to the web. Level document below here is SAIL level.

N Level 2 covers non-conforming product?  
A Step by step instructions are a spin-off from OWI. I have a copy on the web - in draft form.

N When I audit, I audit to the instructions he has.  
A (works website - shows the SAIL lab page. Shows Master List - then MSPs.)

N Can you pull up documents in conference room?  
Pull up this one.  
A Gets MSP P-10.1.

N Find section on procedure for receiving.  
A (para 4 reviewed) Approved procedure can be from history, or they may provide

instructions, e.g. NHB reference.(pulls example from file). Test per NHB - (goes to back of document - shows instructions and requirements).

N Let's hold on to that.-What is this?

A That is my OWI.

N Is this for the cable?

A No - This gives flow/process that this lab uses. It is not step by step of how to perform the test, quality records and retention times, etc. Not the step by step.

N This is in a draft form?

A This is baselined - I am putting out a revision A. I am required to put out a revision A due to document changes. This is baselined.

N Do you talk about changes to make it a revision A?

A No - when it is reviewed by my boss. A CWI prompted the revision.

N So that one is approved?

A yes

N Check MasterList for latest revision - would that call out baseline?

A You can get further information by clicking on it - see approving authority and signatures?

N Would you use Draft A or baseline?

A Baseline is approved - revision is a draft.

N Let's look at that cable.

Walk me through this paper

A (explains instructions)

N Is this a work order number?

A yes - 98B-1020. This is a flight cable for ARC.

N How do you verify you are using a correct version of the drawing?

- A Contact repository. Note tells me how to do test.  
Refers to NHB5300.4. This document shows what voltages. I know because I called the repository. Then I proceed with the test. The drawing wording is in error - Planners called out wrong document.
- N Someone manufactured this cable to the drawing. Does work order show drawing revision?
- A I would assume so. The part number will tell you latest revision, and EO's. I guess you are looking.....
- N What I'm looking for is cable manufactured to latest revision. How do you verify?
- A I don't know. I am not in that process. That is a quality process. I just look for my documents. You should see the planners.
- N You just care about the package given to you?
- A Yes
- N When this cable... You do a continuity test. What equipment do you use?
- A (goes in room with equipment, checks paper and connector) I get mating connector.(explains test procedure)
- N You could use this equipment?
- A Yes - if it is in current calibration - which is verified prior to test by QA.
- N Do you record data?
- A No - only pass/fail.  
If required to record data, we record on a (quality record) data sheet and return to customer.
- N So you keep a copy?
- A Yes- a reference copy only. Very few quality records here. As far as data - no.
- N The cable... How is it completed?
- A Post test data sheet is filled out and a list of equipment/calibration dates, etc., then stamped by QA and becomes a quality record. Sign off line item, initial, date and include in data package.

Phone rings

N OWI shows this?

A Yes, it is all in the OWI - appendix A is my data sheet.(pulls completed copy from files and reviews)

N We are all set here. On the drawing, test specification is outdated, not called out exactly.

A This is good, it will force us to complete the paper. I had input on how to test cables - so I know what is really needed. Planners need to call out proper documents.

N I will make a note of that.

Travel to bldg 4708

N What goes on in here?

A Mechanical component testing( introduces people in room)

N So that is your procedure?

A Yes, EL61-005 Rev A

N Hot off the press?

A Yes

N What is this document?

A Defines day to day operations, how we get work requests, test prep sheets, work orders, etc.

N So the work is done by work order?

A work order, test prep sheet

N This allows you to perform work?

A Yes, we log in sheets in log book and track them

N Is there anything going on now?

A Some O-ring testing.

N O-ring testing?

A Yes . development for Space Station.

N Any vendor parts come in? O-ring?

A Not generally - usually part of an assembly

N What organization does that?

A QA - I guess. GSE goes directly to the lab. Only flight hardware on mechanical components here.

N Is that o-ring and o-ring assembly?

A Assembly - testing related to Space Station.

N How is that brought in?

A Design lab

N A TCP?

A Yes - defining what they are trying to learn.

N Is that an existing TCP or from requester?

A Verbal

N Where do you get instructions?

A Design lab

N What do you do next? Sign-off?

A Unique development testing. Goes into long term test in another building.

N Work is authorized by customer TCP. All requests logged in. Do you have that

log?  
A Yes(shows log). This handles work orders from shop(shows TPS log)

N So this goes from first in - What is this one?  
A Components from engineering shop. Defined as a work order from shop

N I need to know when the forms are filled out and which ones.  
A All requests are logged here - incoming- Master list for tests.

N These procedures are defined here?  
A No - per drawing requirements.

N The O-ring. Let's look at customer TCP.  
A (shows o-ring for test, explains test and application)

N Do you have a TCP for this?  
A Yes - laying here. This is the customer's....

N Is there an associated part number?  
A Yes(shows number on fixture and explains set-up)

N (compares documents requirements to test set-up and documentation) This is your log?  
A Yes

N During sit-down, are procedures changed?  
A Flight hardware requires written changes, Development - verbal.

N What happens when you find problems?  
A Make changes on the spot. Boeing expects variations.

N What about parts on work order?  
A Requirements defined on drawing - if nonconforming, QA is present.

N If 8 good and 2 bad?

A Usually serialized

N Show me test equipment.

A (mass spectrometer shown)

N Does procedure show what equipment to use?

A Not in this case.

N Any data requirements?

A All hand written. Pass/Fail is spelled out.

N This is a mass spectrometer? It detects leaks? Calibrated?

A Yes. It is calibrated daily before and after test. This is unique equipment. All others done by calibration shop.

N (reviews calibration stickers)

A KSC is the only shop that can calibrate this equipment.

N This shows out of calibration. 94?

A I believe I have paper that shows current.

N Can you show me the paper?

A (leaves to get paper)

N What is this?

A Mass Spectrometer calibration standard. (shows KSC and MSFC calibration bar codes. Can't find paper)

N Is there a requirement to calibrate daily?

A No - a test procedure

N How often do you calibrate?

A Today - daily basis

N What is the procedure requirement?

A Manufacturer's manual. We have always done it daily.

N Where is that documented?

A Operators manual.

N How do you document that?

A Procedure calls it out. QA verifies on flight hardware. On development, per vendors manual if not in TCP or TPS. I believe a log book would be appropriate. Flight hardware is verified by QA so it is not needed.

N How can you show me you did the pre/post calibration?

A I can't on development hardware.

N It appears to be out of calibration by 3 years. You might want to check this out - a paper problem or real?(checks other calibrated equipment)

N Is there a calibration lab for mechanical and electrical?

A Yes

N If there is a nonconformance, what do you do?

A QA coverage for flight hardware. They generate test sheet or nonconformance sheet.

N (note to escort and scribe regarding nonconformance with calibration tag. Suggests follow-up)

I want to talk with an inspector on calibration verification.

N We are all set here.

Travel to Bldg 4708 \_ EMI Facility

A Here is the revision A branch's OWI.

N Which are you working to?

A Baseline. Rev A should be out today.

N Let's go downstairs.

Enter EMI room

N Running any test now?

A Yes, in this chamber.

N Let me get these titles.

N What is the test now?

A Space Station cables. Data cables. We are irradiating these cables - looking for noise.

N Does client tell you what test to run?

A Yes - EMI. They tell me what specific test.

N What if surge?

A That is not a normal test. We generate E - field to see if it is destroyed.

N What is a normal test?

A Around 12 tests, 17 total. We don't do tailored tests for submarines, etc.

N Who determines tests?

A EL33

N Is there a work order, specification, or what? For your current method.

A Working on specifics for form - in process of being in electronic form now. Two parts: up front -administrative stuff; bottom- actual negotiation of what we can perform. Once the negotiation is finalized, it is a task agreement and approved by branch level. Requester is the customer. ( explains the task agreement process, shows OWI) Form attachment not released yet.

N Where is the test article?

A All this equipment generates the noise.

N Is everything in calibration?

A Yes

N Is the computer on calibration recall? Software?

A Software latest revision is checked prior to operating equipment. It has a self check to make it idiot proof.

N Who gets the upgraded disk?

A An EMI board decides what gets changed.

Enter Chamber.

A (explains set-up)

N Are the antennas checked periodically?

A They come with calibration from the manufacturer. There is not anywhere to calibrate it. As long as not physically damaged, it won't require calibration.

N Will they always maintain their drift factor?

A Yes

N Doing it during the test?

A Yes

N Other equipment calibrated?

A Yes

N Where is the sticker?

A 1290-132, we usually go by the NEMS number.

N (verifies) What is this called?

A E sensor

N What is the test item?

A These cables.

N Is there a work order telling which test to perform?

A Not a work order - verbal - will use new form

N You could in the past use a verbal work order?

A Yes

N Do you send a data sheet?

A Yes, a test report. I retain a copy, and send to customer. Customer determines pass/fail.

N Is customer equipment listed on agreement form?

A Yes(shows new customer agreement form and explains format. Appendix is a computer form. Fax, etc. with test details)

N Your work order is the task agreement?

A This one was a phone call - just a work order number because new form not ready. Customer gives the test procedure. We keep notes and log book. This is development hardware. Flight hardware has a formal test procedure with verification document and references top level document.

N Would you record which equipment you use?

A Yes

N I want to check test log and flight hardware test example after lunch.

A (Quickly walks through a procedure).

N Can I keep the copy?

A Yes

Break for lunch

**Date: October 21, 1997 - P.M.**

**Auditor: Auditor #3**

Building 4708 EL62

Reviewed lightening imagery sensor procedure plan and requirements document

N: Where is the data received from this test?

A: copy on file in file cabinet (test report) and on floppy disk. We provide the test engineer with a set of data printed out on hard copy. We also keep an electronic version of data.

N: What if you have a failure test?

A: We complete a discrepancy report as listed in the appendix of the procedure.

N: There is a note here, did this item fail the test.

A: No, this signifies that this specific test was not performed.

N: Does procedure tell you what to do when an item does not pass a test?

A: OWI covers performance test. My responsibilities stop with the running of the test. There is a separate group that is responsible for the hardware and for the handling of the discrepancy report.

N: Where in this procedure does it say to develop report?

A: This flow chart shows that we generate test report. The OWI you have is an old one. Here is the new one that has just been baselined today.

N: Does your OWI (EMI Testing) tell you what's the next procedure, (concerning controlling nonconformance)?

A: Any nonconformance we received previously were filed on a 5330 however, P13 tells us to initiate a TDR or DDR and now our OWI points to that process.

N: Are you initiating those now?

A: No we have not had any that needed to be initiated since we began this system.

N: What about test equipment requirements? (looking at a test report)  
A: It will be identified in the procedures if calibration equipment is needed. When calibration is done, it will be entered into log. OWI also tells procedure of what is to be calibrated.

N: Are these calibration items still here? (looking at a test report)  
A: Yes, possibly, we have two different pieces of equipment. If one is out of calibration, we use the other.

N: If I wanted to check the record of calibration, which number do I write down?  
A: (Demonstration of numbers: NEMS, part, etc.)

N: What calibration data is on the spectrum analyzer?  
A: 3/18/98

N: (reviewing test plan) What are the special limits in this test plan?  
A: This is a verification document TRMM-490-022A.

N: What is this number 4GSFC?  
A: This refers you to the plan 4 for Goddard Space Flight Center test plan.

N: In you OWI do you have a place with special instructions of how to identify what this is?  
A: We will have generic form that we can use for identification. This will be an attachment to our OWI. Will be detailed to specify requirements and identification. We don't have the draft form attachment here (I have it up stairs). We will attach that generic form to the plan.

N: I recognize this is a new process. However, I can't know that it works because it is just being put in place. This is a good idea to require a form to be completed to perform a test. I will make a note to make sure that we, or whoever does the assessment, look at the process at the next audit to see that this process is working. Will you run any test before the assessment?  
A: We will run approximately 5 test by the next assessment.

N: Will this be for flight hardware of other test?  
A: Everyone will be required to use this form that is in-scope.

N: What about R & D?

A: Everybody will be required to use this system, so yes, they will have to use the form also.

N: What are the record retention time requirements?

A: 2 years after project completion.

N: I have no problem with this area. I will only have an observation only to make a not for the next person who comes in to audit you. I feel this is a good process.

4707 EH13

Advanced Computer Thomography Inspection System (ACTIS)

N: What is your job function

A: Operator

N: Is there an OWI?

A: Yes, Draft 4. I currently work with these documents. May use a higher level when needed.

N: How does work come to you and when completed, how is it noted?

A: Typically, I do R & D Test Technology and very little Flight Hardware. We receive work request. 90% of our work is R&D. We document the work request on EH13 Work Request which is controlled through access of electronic data base. Once we receive request, CT is performed. Data is recorded on a report form. The completed report form is sent back to the requesting organization and we keep a copy of that report form as a quality record. If it is flight hardware, it is also recorded and kept as a quality record.

N: Do you have a system that details the process for completing and receiving request?

A: The forms are on the web and kept by the Document control Custodian. I can go to my desk and print a form. (an auditor did so)

N: You OWI states that you use (?) badges? Where are they?

A: Yes, (Auditee presents badge)

N: How are these handled/inspected?

A: They are picked up by the medical department and inspected/sent off for testing.

N: (While reviewing OWI) you do a lot of R&D out of scope?

A: yeah, we do a lot of work.

N: What about work tracking and data control, do you have a work request here that I can see?

A: No, I don't have any we are working on that are under this procedure. We haven't had any flight hardware.

N: How do you log work coming in/ work request?

A: Scan data sheet. Slice name are identified per scan number and are traceable so we can go back to both parts to see.

N: Was a report generated on this work?

A: Not yet, we just started working this job. No work has been handled yet. We have been receiving hard request and no tracking.

N: Requirements for the Data Sheet, which OWI does this fall under? (Data Sheet for CT Scan) What OWI states to complete Data Sheet, recording and completing the system?

A: We save scan parameters. I do not know or I'm not sure where it is completed. This is a part of implementation. The Data Sheet is a part of the operator log book that they keep with the finished forms. This is a quality record.

N: Operator log book?

A: Include data that we used in scan and check sheet.

N: You deal with work request?

A: On flight hardware. Years ago, we didn't have that.

N: You have any existing work on flight hardware that request a work request?

A: I actually could have some...I have a copy of the work request performed for the low cost booster.

N: Is there a work request?

A: This one has a work request that was received for the organization.

N: Is there a requirement for this inspection?

A: Yes, this is the work request and what is needed. (showed auditor work request and what is required)

N: What information is included on this work request?

A: This work request has like a routing slip.

N: What other documents are your quality records?

A: All WR forms, Inspection report according to the OWI. I have a cope of each OWI I can get from my office.

N: Can I see that spec, (EH-OWI-013A) Draft 4 Inspection Dye Penetrant.

A: (presented OWI) the numbers are incorrect.

N: Where the actual work performed?

A: Can be done in the field or at 4712

N: Inspection performances (OWI) water-washables? Does the test report tell you which process to use or what material is used?

A: Our drawings and "travelers" tell us.

N: Show me a project you are working to show me that you are performing to the procedures.

A: We don't have the equipment here.

N: Can we go where you can perform a test to see if you are following the procedure.

Go and visit Dye Penetrate Inspection point (4712)

A: We receive a traveler (show example) here is says to perform a penetrate test per Note 7.

N: What does note 7 say?

A: Displays drawing....(Drawing note 7 does not say dye penetrate, however, drawing states per MIL-STD-1249.

N: What is MIL-STD-1249?

A: It is a standard that we generally use.

N: Is this enough information for the inspector to determine what is needed to be done?

A: It s enough information for me because I'm a level 4 certified dye inspector.

N: What is that request number?

A: Drawing number 97M19598

N: What are some materials/equipment you would use?

A: Class 4, Developer NQ(?)

N: What is the shelf life of this product?

A: not sure maybe on the case. (not on the case) maybe on the shipment order.

N: How do you know which to use?

A: The organization would generally specify which type to use.

N: Where would one get a copy of the 1249?

A: You could get it from the Document Custodian or Repository

N: What is the process for securing the latest documents/specs?

A: MSP 5 speaks of that process

N: This light here is it used in the process....is there a calibration process for it?

A: there is no way to do that. No calibration is required. If light doesn't work, we don't use it. We just use the light/developer/water to perform dye penetrate.

N: What if the material is not call out in the form, do you use your expertise to determine material?

A: Process/substance selected has list based on sensitivity.

N: Who purchases this product? (developer)

A: Generally, quality purchase chemicals (MADS sheet)

N: Is there a certification requirement for purchasing penetrate. When you run out, how do you purchase?

A: We contact quality when we run out. Quality has run a test on the different types and have selected this as the penetrate.

N: Where do you get it from...the distributor?

A: Yes, I guess.

N: Are there document or data sheet completed for inspection?

A: The traveler is checked for inspection and the attached work order and sent back to the requester. I would keep a copy for self.

N: What if product fails?

A: I would inform tester. We don't pass or fail we only report findings. However, we would make a report on our inspection report

N: OWI states, you will initiate NCR for items listed found to be in nonconformance.

A: We listed to cover us as part of NCR formats, however, we do not do this. I prepared the OWI and went by some of the guidelines of quality. This was not suppose to be in the OWI and we will change to wording to signify that this not a normal procedure but only done when necessary.

N: After the inspection, what happens if the product doesn't meet requirements?

A: Generally, we may complete (sign inspection block) but this does not mean that the item passes inspection

N: Well I have a problem with the concept. Generally, if a product is signed off as

inspection, it means that the product meets the inspection process. How is your system different from this? How does a person know that this product does not meet inspection if you have signed off in the inspection block?

A: If it is flight hardware, quality has to complete final inspection and give the “go ahead” on the inspection. I don’t do that. I don’t do a pass or fail process.

N: Do you keep a copy of the work order?

A: No we don’t, we keep a copy of the traveler.

N: Do you have a work order or an inspection report in your file?

A: yes

N: How do you know that this is quality sensitive?

A: Level 3 board determines if it is a quality sensitive process.

(Reviewed Work Order/Traveler of a piece of hardware to see where the inspection block is located. Reviewed process of who signs/initials the inspection block and how do you know that it has passed inspection.)

A: The bottom line is that we do not pass or fail a person for inspection. If there is a problem that we notice in inspection, we make a note of that in our inspection report. However, it is quality call to deem whether an item pass or fails an inspection.

**Date: October 22, 1997 - A.M.**

**Auditor: Auditor #3**

EL62, Auditee  
Audit of PCG Project  
Building 4493

N. Anything going on?

A. Hardware inventory, between missions, DR on hardware

N. (This is a...)

A. One of flight unit w/DRs

N. Is there a procedure on this DR

A. OWI

N. What info in procedure tells you how to process flight hardware in system testing?

A. Flight payloads test (actual copy of OWI)

N. (Looking through OWI)

You have hardware that goes out and comes back, do you have that test data?

A. Yes, Functional test data, flight data on disk and branch has a record copy. There is a branch data base that contains flight and test data.

N. The functional test record, where is the procedure?

A. (Looking in file cabinet)

Functional test data file

N. There is data associated with this procedure?

A. Yes, what you're looking at is a form to fill out, you have to fill in the blanks of the test form (as run data form)

N. Looking for "as-run" test procedure

A. Copy of "as run" data file as a hard copy and on disk

N. Asked for copy of TP

A. (Gave me copy of PCG flight payloads testing OWI)

N. Is a test request generated?

A. There is a task agreement in which the verification requirement specifications document (VSRD) written by EL23 is submitted. The chief engineer is responsible for releasing the document and testing is done to the requirements stated in the document.

N. Is there a work instruction for testing after hardware comes back?

A. The Chief engineer states in the verification plan to repeat the test.

N. Is VRSD released here, can I see a copy?

A. No, we don't have one.

N. Where is the VRSD?

A. In repository, as a memo #, and I can call and get one.

N. Are the test procedures to be run and repeated stated in the VRSD?

A. I don't know

N. Is test equipment calibrated?

A. Yes, there will be a records data base log.

N. How does log tie into calibration?

A. After the end of the calibration of a test, we will incorporate that data into the log. Previously, the logs were kept by each individual engineer.

N. Asked to see a test report that calls out the calibration of test equipment

A. She shows him a test report to be filled out.

N. Asked to see an "as run" test procedure

A. She gets a copy of an "as run" procedure.

N. What happens if there is a discrepancy during a test?

A. A test discrepancy report (TDR) is filled out. Procedure can't be closed until TDR is closed and the record copy is in the quality center.

N. Who is responsible for signing this procedure

A. Quality closes the TDR. The test engineer writes it up.

N. Which test equipment is calibrated?

A. Power supply, multi-meter, the oven

N. Are inspection records here?

A. Yes, IR tags, IR #'s on hardware

N. Is there a leak test associated with the hardware?

A. Yes, we look for bubbles in the test

N. Why are you doing the test?

A. Protein will adhere to... there is a safety requirement for containment.

N. Is that a written requirement?

A. It would be in the VRSD and safety documents.

N. May we see a VRSD?

A. Showing VRSD.

N. How do you verify the leak test?

A. Explains procedure - no bubbles per length of time, nitrogen, delta T, etc.

N. How do you verify the pressure?

A. With pressure gauges.

N. Do you have examples of multi-use hardware?

A. Yes, PCAM, we put in new O-rings, and repeat the pressure test.

N. Are the O-rings documented?

A. TPS notes the removal and replacement of O-rings (looking in the PCAM TPS Log)

N. Are the PCAMs serialized?

A. No, there is temporary numbering during leak test. All the parts are interchangeable.  
PCAM numbers change mission to mission. Traceability only on mission and leak test.

N. How many PCAMs go out?

A. Between 10-18.

N. If there is a failure, how is it identified?

A. A failed PCAM would not be shipped. The part is either scrapped or re-worked. All parts are tested before shipping.

N. Does the PCAM get a leak and functional tests?

A. No, just gets a leak test.

N. Since the pressure gauge calibration is only good for a year, could you recall PCAM hardware if the gauge is defective?

A. Unless defect is found 1 week before flight, the PCAM would fly.

N. Can you recall without guessing?

A. Yes, the scientists needs to know which protein is loaded in the PCAM and the astronauts would need to know.

N. Where are the records?

A. There are leak test records. (shows records)

N. There are torque values recorded, where are the torque wrenches?

A. Shows him 28 in-lb torque wrench.

Audit of MGBX

Building 4493

N. Do you have OWI procedures for this area?

A. Yes, Flight Payloads Testing Procedure

N. Are you doing any current testing?

A. Yes, Open TSP for filters.

N. Is this the request?

A. This test is required for flight, we are responsible for maintaining the integrity for flight.

N. What tells you to do this?

A. The request flows down from the Project Office. Explains what the filters are for in the glovebox. It's GSE to support flight hardware.

N. Where is the TSP for the GBX filters?

A. There is a vendor supplied operational manual that explains procedures.

N. Is there a customer agreement form?

A. We're looking to use that, but not currently. CAF is not necessary for GBX filters.

N. Your OWI is vague on how the request is submitted

A. In the past, the request has been verbal, but we knew it was not a good idea. We plan on using a CAF.

N. Where is the memo for GBX?

A. A task agreement is forthcoming for GBX.

N. Can you work without a task agreement?

A. Yes

N. Are there special task agreements either verbal or through memo?

A. Yes, throughout the Project Office

N. You need to be careful. You must have written requirements for all tasks. Verbal instructions are a no-no.

N. Looking at OWI for GBX filters.

A. Going through TPS

N. There is a weight in procedure, does this weight value have to be within a certain range?

A. That is just a baseline weight to account for moisture content in the filters.

N. What do you weigh the filters on?

A. Weighed on a calibrated scale.

N. Where is the scale?

A. Outside the PCG Lab.

N. How do you monitor the moisture?

A. We use a gauge, a hygrometer.

N. Is the TSP a test log?

A. No, TSP log is in addition to the procedure.

N. Where are ovens?

A. Shows the oven, the calibration sticker, and the thermocouple type P.

N. How did you know it was a type P thermocouple?

A. Color of wire.

N. Are you re-generating old test data?

A. Generated by another organization for drying out procedure. We are looking for a delta weight.

N. How is the TSP generated from TBE GBX maintenance manual?

A. Another organization generates TSP.

N. Is TSP archived?

A. Yes, TSPs are filed in the quality records center.

N. Where does the numbering come from on the TSPs?

A. The OWI tells us how to generate our numbering system.

N. Do you have this drawing?

A. Shows copy of drawing.

N. How are you notified of drawing revisions?

A. Our organization would revise the drawings - an AID

N. Is this not a MSFC drawing?

A. It is a released drawing in the MSFC repository, all alterations would be given an altered item drawing number.

N. What if the vendor alters the part?

A. There are no new parts from the vendor, we only alter our current filter drawings.

N. Show me a vendor filter.

A. Shows a filter.

N. How do you handle filter housing discrepancies?

A. We write a DR. Shows a GBX debonded seal DR. Explains that the seal was re-cemented, but has not done functional test yet.

N. So it's a re-work, not a repair.

A. Yes, shows seal rework TSP.

N. Who is the vendor?

A. Bradford Engineering

Audit of ED73

Building 4619

N. Is anything currently being tested?

A. We just finished up a test this morning.

N. Is software verified at system level?

A. No it cannot be verified, and explains why.

N. Why isn't software verified?

A. Software is coded and it is not written by MSFC.

N. Do you get revisions of the software?

A. Yes, we get upgrades and revisions.

N. Who controls calibration of software?

A. Working on system now, software recall is not in the calibration system, we are planning on a quality monitor for recall. LMS software is ISO certified.

N. How do you know if the system and the software is working together?

A. The system is too complex, and explains why.

N. For the test that was finished this AM, where is the paperwork?

A. Looking for data recording sheets.

N. Looks at calibration sticker on amplifier and sees due date of 1988.

N. Where is the procedure for calibration?

A. Vibration and shock testing FOP.

N. Tell me the procedure in your own words.

A. Explains test procedure.

N. Are the accelerometers and signal conditioners calibrated as a unit?

A. Yes

N. Show me the procedure.

A. Shows a draft procedure. States that its in the approval cycle.

N. Is system on a recall or is every test calibrated?

A. Both. Each accelerometer will be calibrated through a charge amp.

N. What test did you do this AM?

A. Shows vibration qual test.

N. Where is test request requirements document?

A. The customer supplies the test requirements and the customer agrees with the procedure through his signature.

N. Is there a procedure for quality not to sign?

A. There is quality. Boeing not MSFC quality.

N. Do you record which test equipment is used?

A. No, because testing and verification end-to-end.

N. Is there an OWI for this area?

A. FOP is shown.

N. There appears to be no Traceability for calibrated equipment for testing.

A. Shows test report.

N. I have 3 issues, test equipment not recorded on test reports, 2 of the 12 signal condition units were out of date, 1 was 1988 and the other was 1996, System test software verification does not exist that drives the shaker table.

**Date: October 22, 1997 - P.M.**

**Auditor: Auditor #3**

**????? : sanitized, replaced an individual's name**

Calibration lab (Bldg. 4650) ISO audit against element 4.11

Introduced to (SIMCO ELECTRONICS) by ?????.

Lead auditor(A)- Is test equipment government equipment ? ????

(B) -Some, Army does standard calibrations (cal's),and we cal our equip. We act as sub to TBE-ship/(restow?) and they procure.

(A)- Is mech./elect./temp. cal done here?

(B)-yes-gauges.

(A) - Is accelerometer (acc) cal done here?

(B) - The capability exists but we have no contract.

(A)- Do you now contract out anything other than acc's?

(B) yes.

(A) - How do you ?

(B) -Army cal's & returns to SIMCO-after (recall?). (send to user?)

(A)- Do you keep Army records-(mil standards ??)

(B)- National Lab... ANSI Z540-1.-data on acc by certification or sticker.

(A) - Is acc vib data, before test (distinguished ?) ?

(B) - if to be recalled , we send notice (3 chances to respond to recall notice).

(A) - May we look @ para. 11.1( internal procedures (IP)) ? draft- rev A will be out in about 12 days.

(A)- Where does out of tolerance closure data reside? electronically kept- NMIS , date, area (system info, i.e. metrology).

(A)- What procedure ( out tol/in tol) was used on current data base?

Before Jun.1 Manufactures Proc. manual - getting in contract today. Mass Spectrometer @ Army has own procedure's per Para 6.4.1 (IP's doc.).

(A)- Any other manufacture manuals used?

(B)- After Jun.1 we controlled proc's /#'s in our files, before Jun.1 used manuf. man.-i.e. oscilloscope(all proc.'s under 1 #).

(A) Do you have proc's/Work Instruction's (WI's).

(B) - yes.- refers (A) to Para 6.4.1 of WI.

(A)- How do you handle out of tol (OOT)?

(B)-Disposition tag ,see para 6.4.20...rev A Para 6.1.7&8 (if can't be repaired , what to do )

(A) - Is this in para 6.4?

(B) yes.

(A) - Does user org. eval. OOT?

(B) yes.see Para 6.1.8 (A)- good quality Record in sec. 8.

(A)- is monthly recall submitted?

(B) yes.

(A)-When?

(B)-1st month- ( shows Oct report).

(A)- Is stowage room environment controlled?

(B)- No-room temp only.

(A)- Do you have a list of cal stamps?

(B)-yes-shows list.

(A) - How do you show in/out/limited designation ?

(B) By stamp color and give a reason for designation.

In example, was it considered in/out of tol.?

Not sure.

How do you know if in or OOT?

Sticker color or look @ cal data.

Is record shown of in cal?

?????- no

Discussion on meaning of OOT vs lim.- no clear resolution.

Is cal dept. responsible for OOT designation?

yes-per Para...

An observation is considered by (A)-cal/limited designation history record not noted(but is in the proc., however if lost(decal) then must re-cal.

?????-proposes adding to proc.(A)-ok.

Is cal data required for outside vendor?

yes- per sec. 4.9.

What is documentation required for outside vendors?

Copy of cal record.-as found/as left.

OK-so currently the Army sends back equipment to dept.?  
There are cases where they do not send back to cal lab,i.e. Hewlett Packard's are cal'd & sent to user org.

Discussion of observation by (A).

Not on recall list?  
Right.

Which dept.'s? EL?ED?EH?EP.

Would it be internally kept?  
per... 6.1.18...flow traceable to...proc.

And you bought into this?  
yes-outside vendors mean \$\$- cal lab & MSFC made decision over 25 yrs. ago.

Are they contractor approved vendors?  
Hope so-cal lab decision.

Bigger scales cal ?  
After Jun.1. NIMS #, before Jun.1 -don't know..

Look @ this example- Army sends back equipment, do you update cal label ?  
yes- per section...of proc.- but not data(?).

Does proc. say data req'd for out of spec.?  
yes- 8.1.2.(?)

(A)-Proc. says keep data .  
(B) Response- Army may not...?... proc.  
????? ...still thinks ok- per 4.10 cal decal as req.(record retention req.).4.9.6.2 new  
verbiage- ??????...any certified contractor vendor---?.

(A) Cindy , what Army cal form comes back?  
(B) 1621 (doc. transfer ?).discussion on disposition of tags/forms/etc.

Wrap up- 2 issues- maybe- after follow-up check on rev. A to doc., and possible clarifications of statements.

(A)--see possibly 2 issues as follows:

!) Limited calibration issue- if can't read label may mean re-cal required.

Outside vendors must keep Quality related records 2 yrs. per procedure( which is out for rev-12 days , comments not conclusive), but baseline does not require.- leave to your discretion (don't see a NCR ) suggest people get familiar with procedure and do it.

**Date: October 22, 1997 - A.M.**

**Auditor: Auditor #3**

**?????: sanitized, replaced an individual's name**

**ISO Elements Audited:**

4.17 Internal Quality Audits, and 4.14 Corrective and Preventive Action

**Organization Audited:**

CR50 and CR10 Bldg. 4203

**Questions/ Answers**

(N = NQA Auditor / A = Auditee)

N: Is there a draft (procedure for internal audits)?

A: (Presenting document) That's the official release. I'm considering a change but its not implemented.

N: We talked briefly yesterday about corrective action, ... tie to 4.14 or is that a separate system?

A: Yes.

N: Can I take a look at that procedure?

A: I can show you on the computer that its the latest.

N: How do you go about making sure that the elements and the standard are covered?

A: The Lead Auditor and the organizational representative get together in a pre-meeting. They get an idea of the relevant elements, put them down, and go audit. If they are not sure of an elements relevance, its included in the audit. I review and sign the audit plan. That gave us a good sign early and we omitted element 17, next time we'll audit for 17.

N: Was an internal audit performed on 4.17?

A: Yes, as part of S&MA, CR01. At that time, they found an observation; I took action on it and made it better.

N: As for as the audit team is concerned, how do they determine which should go into what element?

A: Two ways, element at time of (Interrupted.)

N: How are auditors assigned, how do you insure no conflict?

A: Lets say EL is audited, I make sure that there are no EL auditors on that team.

N: (?)

A: This is a first round. We skipped September; There will be another round when you leave. The schedule is on the Internet.

N: In this audit schedule, how do you insure the applicable elements are covered?

A: The Lead auditor and the Point Of Contact go over the organization activities and how they do business, and establish the applicable elements. They try (include) the uncertain ones, I review the plan. The organizational representative coordinates within the organization. (A. read the procedure and elaborated.)

N: Is there a legend of the organizations?

A: (Showing phone book) I keep mine more up to date; here's management.

N: This is your audit results?

A: Here's how I kept it; here's a pictorial display, (reading several). I've got one more report. That's TA (an organization) not entered, I keep the Implementation (group) and the Quality Council informed. (Showed and explained Quality Council documents). On a weekly basis this is how I do it. (explained Quality Council meeting frequency and presentation content, score keeping, scheduled timeline.)

N: The closure of NCR's is the responsibility of the audited organization?  
A: Its two part; its best to show you the form. Here's the form: the Auditor fills it out, the Lead Auditor approves it. The assigned organization is responsible; it ID's the cause and corrective action, they sign.

N: What kind of time frame is given them?  
A: Ten days, the goal is to get it to me within ten working days.

N: Can I see your procedure?  
A: (Read procedure, explained how it is now and a plan for improving it. Showed the ten days in the procedure, then what happens if its 30 days late.) Usually what happens is the organizational representative explains the delay; its shown at the Quality Council weekly meeting where the organization sees it, management sees it, ????? sees it and can send a letter if its required. (Gave example) I examine each case; usually there is a problem or they are inactive. (Showed a score sheet)

N: What does the procedure say currently?  
A: (?)

N: Let me ask you a question about do you have the Auditee identify the causes?  
A: Yes, Identify the cause and corrective action.

N: Is there a documentation control repository or a document and data control area within this group or this company?  
A: Two, no, three places where documents reside. ISO is web based. Level four documents were delegated to the organizations. They were reluctant to store them electronically until after the first audit, then they went electronic.

N: So every area has electronic?  
A: I'm not sure; that's the goal, but its not dictated. One organization has one Branch with hardcopy. ISO is on the web and at the Repository. Industry Standards are in the Labs. They subscribe to CD's. NASA is to develop an industry home page, so that all Centers can (access) it. Its not here yet. EL has a contract with a company who provides updates.

N: Say an inspector needed a copy of a latest drawing?  
A: I'm not sure; I'd defer to the organization.

N: If that's the case, is there an area you audit?

A: Yes, depends on the organization. EH uses drawings and (?)

N: What about the Repository itself?

A: ????? is the Director of (that) and the Point of Contact (A. reviews organization in the phone book)

N: CN was audited?

A: Yes.

N: CM done the week of September 23. What about the calibration department?

A: I think AA has the parts.

N: September 8?

A: Yes.

N: Purchasing?

A: GB, ?????, (other names given), CN,CM.GP,AA

N: What about the environmental area?

A: (?)

N: I'd like to visit the thermal test area.

A: October 19, that area.

N: Which area would cover Receiving Inspection?

A: CN

N: What about 4.7?

A: That's also CN

N: You mentioned something about training?

A: CM

N: Lets do Corrective Action.  
A: That would reside with CR, ?????.

N: CR is on what?  
A: 28 July.

N: One of the concerns we brought up Tuesday was document status.  
A: We chose to go with (audit) with draft documents, we had no choice.

1. Many were not getting with it, and the audit became a deadline.
2. We couldn't wait, it gave us a chance to develop documents.
3. It helped organizations find non-conformances.

We expect it to be easier next time. Audit (?) and have training.

N: Training requirements for Auditors separate from 4.18 requirements for others?  
A: We treat it like corrective action and keep it separate. In the organization, the supervisor (establishes) training; for ISO, I'm the supervisor and I establish training.

N: Who keeps the Lead Auditor certification?  
A: Training keeps the record, I've kept a database. (Shows database)

N: What is your procedural requirement for - Leave that out.  
A: The Procedure says (reads procedure re training).

N: Address retention requirements?  
A: NCR's, these forms, are retained by me for three years; notes, raw notes, training record sheets, and (auditor) participation sheets are also kept for three years.

N: In an audited organization where you started with a draft document, what are your plans for the audit in February? Run through of baseline?  
A: 1. Track NCR's, verify also other findings.

N: Verification of NCR, verify NCR closed.

A: (Recycle in November - December) Doing the right things with respect to this Pre-audit. I don't have a plan in place for document release.

N: There are several ways to insure that documents are in place. The Lead Auditor structure is excellent. Don't have internal audit of finalized system. Its not out of control.

N: Does the auditee get the report or the NCR's?

A: The report.

N: Is that in the procedure?

A: Yes (shows procedure).

N: What about the auditee receiving a copy of the final report?

A: (Reads the procedure and explains.)

N: Audit reports (? ?), can you show evidence that the audited organization received it?

A: (Explains the distribution; the answer is "yes".) I hand deliver it to the organizational representative in the morning, since they have ten days to respond.

N: Are any of these gentlemen Lead Auditors?

A: ????? is (one). (A. introduced ????? as Lead-Auditor-to-be-trained, and as auditee's alternate.)

N: Are there words in the procedure that a designee can do that?

A: I'm not sure. (Begins looking in procedure to be sure.)

N: (To Escort, ?????, hereafter called "ER") May I ask you a few questions?

ER: Yes.

N: Have you done any audits?

ER: JA and EJ, the Project Office and the Project Engineer in the Flight Projects Office.

N: Prior to auditing, was there any paper you had to generate?  
ER: Yes, the audit plan; I had several meetings with (the organizational representative).

N: Did you cover all elements?  
ER: Yes, all 20; we decided that some were out of scope. The report specified the out of scope elements.

N: Did you classify your findings?  
ER: Yes, major and minor. We looked for systemic (findings).

N: May I see that audit?  
A: (Pulled file and reviewed the content types and distribution.)

N: When you claim a finding, why would you issue a major?  
ER: We're looking for systemic findings, OWI's in draft form, (another example).

N: How are observed concerns documented?  
A: They are documented in the (final) report text in the summary area.  
ER: The (NCR) log includes observations, but those NCR's are not in the final report.

N: Do you have a database on tracking NCR'S?  
A: Quality Council are mailed weekly (shows log; can't find JA or EJ).

N: The Corrective Action System is part of the internal audit process; how do you make sure this is closed?  
A: I have a log, its not officially closed until I (agree) and log it  
ER: (Describes his closure flow.)

N: How do you control Block 5?  
A: Its "proposed corrective action in place". (Explains with log sheet.)

N: As far as this report, is there any reason why its not or this (log)?  
A: They're not closed.

N: So it should be on this (other) list as open?

A: Yes.

N: As part of the Audit Plan, do you put in the Audit Plan to verify NCR closure?

A: We put in spot checks; it will be in the planning on the next audit (shows procedure).

N: If they're not on your list, could they be verified on the next audit?

A: They could: the Lead Auditor will review the (previous audit) file.

N: Will closed ones be in his package?

A: They'll be in this (previous audit) file.

N: The next person doing JA would see this?

A: Yes.

ER: Yes.

N: Where is the AA audit report?

A: (Gets report)

N: Are these internal audit reports identified by a report number?

A: Yes, They are referenced by document number or organization symbol.

N: In the AA report, are these the elements?

A: Yes.

N: Who did the Audit?

A: ????? was Lead Auditor. (????? arrived with the AA NCR's.)

N: Is there something in the procedure about corrective action?

A: (Explains the procedure.)

N: What's the time frame on this?

A: Its this (pointing).

N: You do this on a weekly basis?

A: Yes.

N: Do you have a time frame on this?

A: No.

N: I want to check that Auditors and Lead Auditors are trained.

A: (showed Auditor database input sheets.) You want to look at (Lead Auditor) ?????

N: Yes.

A: (Shows ????? sheet.)

N: I want to see an auditor.

A: (Shows ????? sheet.)

N: I want to see GP (audit report). How many findings?

A: Seventeen: one is late, three are closed, 13 have a (closure) plan.

N: You show 8.18 on the twenty-second. GP is Purchasing.

A: (Reviews method.)

N: Show ????? and procedure.

A: (Procedure read. ????? experience sheet shown.)

N: This non-conformance log generated by the Auditor.

A: Yes, by the Lead Auditor. (Review log.)

N: Is the log issued?

A: No, its just a Lead Auditor tool.

N: Who assigns audit numbers? (An audit number is the number assigned to each NCR on the NCR log.)

A : The Lead Auditor.

N: Within the audit report, are they required to record the revision level (of documents)?

A: I haven't made that an issue. (No.)

N: What about in the report itself?

A: They were directed to audit to drafts (draft documents).

N: I want to see the report (for GP).

A: This is the report (shows other documents in the file).

N: You have any questions for me?

A: No, sir.

N: Discussed what will be in the closing meeting today. Strongly commended several items.

N: What corrective actions do you track in this area, which are you responsible for?

A: Primarily hardware, software, potentially ET, customer quality comments. I have Level 3 OWI for (?).

N: Who gets corrective actions from suppliers. You ever issue non-compliance?

A: Not corrective action, but non-conformance. That's more INAR (Inspection and Receiving). If the Contracting Officer accepts (the item), its screened for (needed) corrective action.

N: How does the screening procedure work?

A: If we have a customer comment, we have a system for "all, none, and some". MSP 14.1 has the screening criteria. I'm the OPR on 13.1. MSP 14.1 is written for internal and external, we recently deleted internal customers (from it).

N: May I see 14.1?

A: Yes. (Showed it.)

N: System hasn't started yet?

A: No. (Showed draft 7 with mark-up.)

N: That form's a mechanism for addressing customer feedback. What about (receiving feedback by a phone) call from someone who doesn't know about the form?

A: There is no written process in place if a call comes in outside the system. If it comes to the Project (Office) of the Contracting Officer, we work it.

N: How do you plan to handle it in the future? Do program people know to call you?

A: Yes, its covered in the procedure.

N: I looked and didn't see it, could you show me?

A: (Looking for it.)

As a point of information, I must have a complaint form or it doesn't exist.

**Date: October 23, 1997 - P.M.**

**Auditor: Auditor #3**

**?????: sanitized, replaced an individual's name**

Scribe notation legend:        N-Auditor  
    F-????? Auditee #1  
    J-????? Auditee #2  
    M - ?????? Auditee #3  
    E-????? Escort

N- How are corrective action comments handled on the Corrective Action Form?

J- Efforts are being made to make a clean break from the previous system (NCR) to the ISO 9000 method.

N- Do you get involved with the implementation of the Corrective Action?

J- No I am the author.

F- Yes, I will be implementing the Corrective Action.

N- Give me a scenario of how you implement the Corrective Action.

F- An NCR is written in the field on a form 460. A screening process then is performed by S & MA. The failure and type of NCR is then classified i.e. what type of hardware was affected , flight or development and does it meet the criteria for further action.

F- The appropriate people are informed, Chief Engineer and Project Manager. The root cause is identified. All appropriated people must then agree on the root cause and the corrective action. For example is more training necessary, was it a design problem, or was it caused by the facility.

N- Is the hardware in limbo while the corrective action is worked?

F- No, we just rework the affected area and the ultimate decision is with the hardware test engineer on whether to go forward or not.

F- Evidence must be presented to verify that corrective action was initiated and performed. Also a problem review board must close the paper work that the corrective action was performed.

N- Okay preventative action, who gets involved with that?

J- It is an option at the start of the project initiated by the Project Manager and preventive action is employed throughout the life of the project.

N- Is there a preventive action team in place? Who will determine when a Preventive Action will take place?

J- The initiation takes place when the Project Plan and Quality Plan are developed through the Project Manager.

N- How well is the Preventive Action documented?

J- We have a process in place that is tied to ALERTS which are referenced in the procedure 14.1 procedure. We also have Quality Comments too. The procedure is already released that establishes the process. But prior to an initiation of the process a

screening process takes place by the project manager. The project must be in excess of \$200 million. Section 4.1 in the (14.1) procedure sets the criteria. The ALERTS coordinator tracks all of the ALERTS. If a RCAR is written (replaces the NCR) then a preventative action is initiated at that time. But first the preventive action must be agreed upon by the people involved in the RCAR process, the Project Manager, S &MA representative and the engineer who is closest to the process or responsible for the hardware, i.e. the test engineer. An entry in the data base is made to provide a lessons learned for others to prevent the mistake from re-occurring. We have an example of an RCAR in our procedure (14.1) which addresses preventative action. There has not been an RCAR issued because the process is not yet in place.

N- What happens to DR's? Do you have an example?

F- Yes these DR's are closed out by CR30 and now we will generate an RCAR if the screening criteria is met based on the DR.

N- We will request all of your implementation data the next time we are here. We want to see a history of implementation. We also want to see how you track your RCAR's.

F- We track RCAR's in our data base which I can show you on the S&MA website. The I&PL address is listed in the 14.1 procedure that covers the Corrective Action. If RCARS get through our screening process then we put them in our data base. We are going to use hard copies until we get the data base up and functional.

N- Good we will want to see how you handle the comments from the Corrective Action on your data base when we return.

CR30's audit ends here and after a short break we go to building 4566 to follow up on ISO 9000 element 4.10 and 4.11, Inspection and Test and Measurement and Test Equipment.

Organization audited: EB12

Auditee: ????? EB12

N- Hello ??M?? what do you do in this organization?

M- I am the calibration contact for EB12. I determine what equipment needs to be calibrated. I can show you our equipment room down the hall. The equipment is used to research test equipment and not flight hardware. We have category I, II, and III here.

N- What is the qualification for category I, II, and III equipment?

M- Here it is in our procedure. We get a form 1621 from the calibration lab when the equipment returns from calibration. We choose to have stickers on our equipment even if it is a category III. We designate what category our equipment is in our log book which has all of our serial numbers of each piece of equipment we own.

N- Thanks that is all I need at this time.

NQA, escorts and scribe return to the main office in bldg. 4203 room 1201. It is three o'clock in the afternoon now and that concludes the duties of NQA and supporting auditors, escorts and scribes.