The following slides are not contractual in nature and are for information purposes only as of June 2015.
Areas Covered

• Summary of Webinars 1-7
• Overview of Webinar 8
• CAR Responses - General
  – Acceptable
  – Unacceptable
  – Dealing with Responses
• Overview CAR Form
• Type CAR Responses
• CAR Scenarios
• References
• Q&A
Continuing the Series

• Webinar 1: Command Media Expectations
• Webinar 2: CA Internal Procedures
• Webinar 3: CAR Levels & Criteria
• Webinar 4: CAR Writing
• Webinar 5: Containment
• Webinar 6: DCMA CARs
• Webinar 7: Root Cause analysis
Webinar 8 – Corrective Action Summary

• Creating the Corrective Action Plan
  – Generate and Implement Solution
  – Verify Results and Document
  – Monitor and Measure Corrective Action Process

• Closing the Corrective Action Plan

Continuing the Series
Corrective Action is the implementation of a solution(s) that result in the reduction/elimination of an identified nonconforming issue/event that is normally associated with a corrective action plan (CAP). It has the ability to be measured and validated.
Corrective Action Request Form

Summary of Required Information

- Related LM Aero CAR number
- Date of CAR initiation & due date
- Submitted By (Company name)
- LM Supplier ID Number
- Name of Submitter
- Date of Response Transmitted
- Part number/Service Affected.
- **At least one industry recognized tool for root cause identification.**
- Discrepancy
- Response
- Containment actions
- Root Cause
- CAP

Elements
Fish Bone Diagram

Factors contributing to defect:

- Measurements
  - Calibration
  - Microscopes
  - Inspectors
  - Humidity
  - Temperature

- Materials
  - Alloys
  - Lubricants
  - Angle
  - Engager
  - Brake

- Personnel
  - Shifts
  - Training
  - Operators
  - Blade wear

- Environment
- Methods
- Machines

Defect

Considered an effective tool in help identifying the root cause of a single non-conformance condition*

Recognized Industry Tools Identifying the Root Cause
Specific Goal to Defining Specific Deviations

Possible Solution  Causal Factor

Recognized Industry Tools
5-Why Analysis

The engine will not start.

- **Why?** - The battery is dead. (first)
- **Why?** - The generator is not functioning. (second)
- **Why?** – The shaft is sheared. (third)
- **Why?** - The generator was well beyond its recommended service life according to FRACAS and was not replaced. (fourth)
- **Why?** – Time and cycle log was overlooked (fifth)

This track could continue …

- **Why?**- Process not followed for maintenance planning (sixth)

*Root Cause* – Process for maintenance planning was not followed

**Recognized Industry Tools Identifying the Root Cause**
Corrective Action Response Requirements

• Does the Corrective Action response address system process non-conformance, by means of an adequate Root Cause?

• Understand the process prior to accepting the CA and root cause.

• Does the response ensure no re-occurrence?

• Can the result be measured and validated?
Evaluating the Response

The supplier response should be evaluated in accordance with requirements. Has the:

- Root cause been effectively identified
- Corrective action improved the process and prevented recurrence

If Acceptable

- Establish validation follow-up date within 30 days of C/A effectivity (effectivity being the point that all corrective actions have been taken, validated and incorporated into the product)
- Enter CAR response information into SQMS
- Answer original LM Aeronautics site, supplier site, or audit rejection document(s) with supplier’s cause, corrective action, effectivity statement and reference CAR number, if applicable
- Perform validation of C/A - if follow-up validation is successful/accepted update SQMS with validation, CAR results and other entries to close the CAR

If Unacceptable

- Document rejection in SQMS
- Return CAR to supplier & establish a new due date
- If unacceptable after 2nd attempt or supplier fails to respond, consider elevating the CAR to SQM QEB or Senior Management

- Implications for a rejected CAR
Dealing with Supplier Rejected Responses

Rejections

- Extend CAR due date when supplier provides adequate justification or inability to meet due date
- Reject CAR, if supplier is non-responsive to CAR or the CAP does not contain the required RCCA to prevent recurrence
- Provide justification and reasons for rejecting or extending
Dealing with Supplier Request for Extensions

Some Conditions to Extend
- Issue has been expanded
- The need to gather additional information
- Time/event driven circumstances

Some Conditions *not* to Extend
- Slipped through the cracks
- Convenience
- Failure to respond

*The Expectation is no delinquencies!*
Verification & Validation

• Verification – Confirmation by means of reviewing the objective evidence to ensure that specified requirements have been fulfilled

• Validation – Ensure that the same nonconformance has not re-occurred by means of appropriate documentation

• Verify that the actions have been \textit{completed and are effective}!

Note: This topic will expanded in Webinar #10 “CAR Follow-up”
Responses

Types of CA Responses

- **Good** – This satisfies all the LM requirements and CAP requirements with minimal waste of time and expense
- **Poor** – This does not satisfy LM requirements nor that of the CAP. Could be considered open ended
- **Ugly** - This dysfunctional approach that eventually satisfies all the LM requirements and CAP requirements with some element that could be interpreted as open ended.

Reviewing the Proposed Actions
The Good

- **Request Number (-Rev):** 11111
- (Level 1 - Excluded from Rating)
- **Findings:** 1
- **Issue Date:** 02/05/2010
- **Date Due:** 03/22/2010
- **Part Number:** 121212-1
- **Tool Number:** Not applicable
- **Tool Code:** Not applicable
- **Defect Code:** Hardware Discrepancy
- **Program:** XXXXX

**Non Conformance**
- **Requirement Document(s):** XXXXX
- **Requirement:** (Should Be)
  - XXXXX sec 3.7.1 Mag particle inspection shall be performed after completion of all operations that affect surface condition of hardware (ex:..., proof testing).
- **Discrepancy (Is)
  - Mag particle inspection process was performed prior to proof testing (ref: FMH WO#XXXXXX indicates XXXXX, OP120 indicates proof test).

Acceptable Response
The Good

- **Corrective Action Acceptable**: Yes
- **Cause Code**: NDT Processing Error
- **Root Cause Analysis**:
  1. Planning was not part of Contract Review process at the time of PO acceptance.
  2. Inadequate review by Engineering during shop traveler review process.
  3. No current procedural requirement for specification review during shop traveler review.
  4. No current procedural requirement for Quality to review Special Processing Quality Assurance / Inspection provisions contained within the applicable specification.

- **Supplier Corrective Action**:
  - Immediate Corrective Action Taken:
    Shop traveler has been updated.
    Customer has been contacted via Disclosure Letter.
    QP-XX Updated to include more specific review requirements.
    Updated SOP 3.3 Contract Review to add review blocks for specifications.
    Internal CAR's were issued against both Engineering and Planning for not following current procedures.
    Reviewed all other Program products specifically for the sequencing of XXXXX operations.

- **Preventative Corrective Action Taken**:
  1. Updating contract Review procedure to break out Engineering and Planning into two different sections.
  2. Perform additional training to new process.
  3. Update QP-XX Traveler Control to include more detailed requirements within the Engineering section.
    Added : Special processes shall be reviewed for the following at a minimum:
    § Embedded processes;
    § Embedded tolerances;
    § Test sample requirements;
    § Process sequencing per applicable specification
  4. Updated QP-XX in the Quality review section to include reviewing the following:
    " Special Processing Quality Assurance / Inspection provisions contained within the applicable specification (e.g. Penetrant, Radiography, Magnetic Inspect, etc)
  5. Use the newly developed Spec. Review checklist during FAI process.

- *There is a 5-Whys Root Cause analysis attached*
The Bad

- Request Number (-Rev): 22222-2
- (Level 1 - Excluded from Rating)
- Findings: 1
- Issue Date: 02/05/2010
- Date Due: 03/22/2010
- Part Number: XXXXX
- Tool Number: Not applicable
- Tool Code: Not applicable
- Defect Code: Identification incorrect
- Program: XXXXX

Non Conformance

- Requirement Document(s): XXXXX
- Requirement: (Should Be) - PO XXXX and Sales Order #XXXX are for S/N 111
- Discrepancy (Is) Sales Order #XXX1 and Shipper # XXXX are closed and the S/N 111 unit is still at supplier XYZ. Do not know what S/N or P/N shipped on this shipper.

Poor Response
The Bad

- **Corrective Action Acceptable:** Yes
- **Cause Code:** Material Handling

- **Root Cause Analysis:** Confusion caused by too many units on inspection shelves (example - units waiting for data pack, contracts issues, etc.).
- **Supplier Corrective Action:** Set up data pack review shelves in team leads area for units not ready for inspection.
The Ugly

- Request Number (-Rev): 33333-3
- (Level 2 – Included in Rating)
- Findings: 1
- Issue Date: 02/05/2010
- Date Due: 03/22/2010
- Part Number: XXXX
- Tool Number: Not applicable
- Tool Code: Not applicable
- Defect Code: Hardware Discrepancy
- Program: XXXX

Non Conformance
- Requirement Document(s): XXXXX
- Requirement: (Should Be) PO Quality Clause QX
  Appendix QX paragraph: 2.3.1 & Seller shall ensure effective corrective action is taken to prevent, minimize or eliminate non-conformances.
  AS9100 paragraph 8.5.2. Corrective Action: The organization shall take action to eliminate the causes of nonconformities in order to prevent reoccurrence.
- Discrepancy (Is) - The XXXXX-XX Bulkhead, serial number XXXXXX found to be wrong configuration. The bulkhead has two material conditions: the first at LBL 10, measuring 0.0XX high; the second at LBL 10 measuring 0.0XXX deep.
The Ugly

- **Corrective Action Acceptable:** Yes
- **Cause Code:** Acceptance Test Inadequate

- **Root Cause Analysis:** A formal Quality Inspection Plan had not been developed, which include visual inspection requirements

- **Supplier Corrective Action:** A Quality Inspection Plan has been created that includes dimensional and visual inspection requirements as well as specifically identifying a caution for this particular areas.
  
  Note: Supplier is currently cause mapping product and conducting FMEA with all functions on new Lockheed work, also Quality Inspection Plans are created prior to release of First Article Inspections, Formal procedure for Quality Inspection Plan process will be updated and complete by 03/31/10.
  Perform additional training for all additional inspection personnel.

- **Preventative:** Supplier is currently cause mapping product and conducting FMEA with all functions on new Lockheed work, also Quality Inspection Plans are created prior to release of First Article Inspections, Formal procedure for Quality Inspection Plan process will be updated and complete by 03/31/10.
  Perform additional training for all additional inspection personnel. Is performing an analysis to identify all similar at risk deliverables
An auditor has reviewed the control of non-conforming material at a supplier. The supplier has a separate secured area where all non-conforming material is stored until the material is dispositioned.

During the review of the room, it is noticed that the materials dispositioned as scrap are being placed in containers and then those containers are also stored in the secured area. The material dispositioned as “scrap” appears to be in varying in condition. An inquiry is made to the supplier to final disposition of those containers. The response is, a separate another Subtier supplier removes the scrap containers at the request of the supplier.

AS9100 is governing document, a non conformance should be produce, due to AS9100 Section 8.3. This requires that all scrap material be segregated until physically rendered unusable.

In reality, this supplier segregates their scrap but there is no indication that it has been rendered leaving unusable prior to leaving the facility.
Scenario 1 – Uncontrolled Materials

Which would be the most effective corrective action?

**Option 1:** The supplier gives sufficient reason on why the current system is compliant/effective. Making the statement that there has been no recorded events of scrap material being utilized as an approved deliverable.

**Option 2:** The supplier adds procedure to physically make the material unusable and adds a concurrence or validation prior to making the material available to the subtier prior to removal.

**Option 3:** The supplier adds the task to specific operating process that is part of a larger production operation. Validation of the questionable material being made unusable is implied.
Scenario 1 - Uncontrolled Materials

The most effective course of action for this scenario would be **Option 2**. It provides a specific measured action that directly addresses the non-conformance. It also provides a validation element as well.

**Option 1** is somewhat argumentative, subject to interpretation and lacks the backing of any meaningful operating procedures that would prevent any future escapes of this nature.

**Option 3** has the same issues as option one. Though it does add a procedure, it lack any validation that would prevent any future escapes.

*Note: Scrap materials being used as a deliverable, has the real possibility of becoming a counterfeit deliverable issue.*
Scenario 2 – The use of tracking tools

The Management Review procedure has been reviewed. It states they have defined measurable objectives for productivity, Customer satisfaction, and quality. When a request is made to see the measures reviewed during a management review meeting, a member of supplier’s management turns over a list of documents that contains charts, graphs, and pivot tables. However the document lack any kind of goals, explanations and or meaningful trending directions that would indicate which direction the supplier is going.

Management understands each chart and is clearly involved, However when questioned on the use of these tools in order to drive improvement, or whether goals are being met, a definitive response is not given.

AS9100 is governing document, a non conformance should be produce, due to AS9100 Section 5.6.1. in part “that top management shall include assessing opportunities for improvement of its effectiveness of it’s QMS” and the plant’s procedure stated they will have defined measurable objectives for quality and none were found during this review.
Scenario Two

Which would be the most effective corrective action?

Option 1: The supplier gives sufficient reason on why the current system is compliant/effective. Making the statement that the plant is operating at an acceptable level.

Option 2: The supplier adds provision to review all documents that contains charts, graphs, and pivot tables and other necessary information that would demonstrate effective trending analysis and relevant goals. Goals and other relevant improvements actions are listed. The general intent being improving specific and overall general quality.

Option 3: The supplier removes the requirement from its operating procedures.
Scenario Two

The most effective course of action for this scenario would be **Option 2**. It provides a specific measured action that directly addresses the non conformance.

**Option 1** is somewhat argumentative, subject to interpretation and lacks the backing of any meaningful operating procedures that would prevent any future escapes of this nature.

**Option 3** creates an additional non conformance by violating the same issue.
Reference Materials

LM Based

- **IAQG** – Root Cause Analysis and Problem Solving (aligned with IAQG 9136 draft)
  www.iaqg.org/scmh
- **AC-1388** – Resolution of Findings and Discrepancies-Corrective Action Process
- **AC-3031** – Corrective Action Tasks for All LM Aeronautics Manufacturing Programs

Supplementary

- *Quality Engineering Handbook*,
- *Juran’s Quality Handbook*,

Sources
Introduction to next Webinar

Topic 10 – "CAR Follow-up"

Continuing the series