

***NORTHROP GRUMMAN***

Aerospace Systems

# **Preparation and Processing of Supplier Material Review Reports (SMRR) - Supplemental Guidance**

**E0-0615M**

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### Approval Signatures

- Approved by:** (Approval on file)  
Andy Yanez  
MRBQA
- Approved by:** (Approval on file)  
Steve Paolini  
Supplier Quality
- Approved by:** (Approval on file)  
Scott Danner  
Chief Engineer
- Approved by:** (Signature on file)  
Carlos Gurrola  
Structures Design Engineering

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## I. SCOPE

This Guide applies to all Aerospace Systems Project IDs identified in the Supplier Quality Assurance Requirements (SQAR) document. This document is located on the Northrop Grumman OASIS website. This document does not take precedence over the SQAR or Engineering documents, in the event of a conflict.

## II. PURPOSE

This Guide has been developed as a means to assist Northrop Grumman suppliers in the preparation of Supplier Material Review Reports (SMRR/WT) to facilitate a timely disposition response from the Northrop Grumman Corporation Material Review Board (NGC MRB). This Guide is for the Supplier's benefit and is to be implemented at their discretion. Guidance supplied in the *MES-NC OASIS Training (SMRRs)* will be followed.

## III. SMRR DISCREPANCY DESCRIPTION

SMRRs need to be written in a manner that closely anticipates the information needs of the NGC MRB to reduce SMRR resubmissions and schedule delays. Unique non-conformance conditions will always occur; an attempt has been made to identify those pieces of information that are routinely required in order to successfully disposition a non-conformance.

### A. Discrepancy Text

The following pieces of information are required in the Discrepancy Text of an SMRR (see Figure 1). The presence of this information in the Discrepancy Text does not preclude it from being repeated, as necessary, in SMRR sketches, graphics, and other attachments.

1. **Manufacturing Operation:** Identify the operation during which defect was created or detected.
  - Example: "During NDI," "During PMM Operations," "At Sequence XXX"
2. **Part Number/Part Name:** Enter the part number, dash number, and part name of the defective part.
  - Example: 2CSH12345-0001, Skin, Panel, Access.
3. **Part Criticality:** If a part is Fracture Critical (FC), Fracture Critical Traceable (FCT), Fracture Critical Non-Traceable (FCNT), Maintenance Critical (MC), Hardness Critical (HCI), Safety Critical (SC), Mission-Abort Critical (MAC) or Durability Critical (DC), the criticality should be identified as a suffix to the part number/part name.
  - Example: 2CSH12345-0001, Skin, Panel, Access **(MC)**.
  - Include serial numbers for all traceable parts.

4. **Discrepancy Type:** Enter a clear and concise description of each discrepancy type. You should not have to review any other document to understand the type of discrepancy.
  - Insufficient Discrepancy Description: “There is damage on the part.”
  - Accurate Discrepancy Description: “There is a machined gouge on the longeron stiffener.”
5. **Discrepancy Location:** The discrepancy text should provide a detailed description of the location of the discrepancy by one or more of the following:
  - List the X Y Z location of the affected area. Always required for assemblies, but not sufficient alone. Optional for detail parts.
  - Description of location in words as it relates to “landmark” features.
  - Dimension of defect location from part edges/features.
6. **“Is” Condition:** State the “is” condition with actual measurement(s)/dimension(s). When multiple parts are affected, list the defect measurement of each part.
  - Insufficient “Is” Condition: “Part lost vacuum during cure cycle.”
  - Accurate “Is” Condition: “11.5. inHg of vacuum measured at minute 91 of cure cycle.”
7. **“Should Be” Condition:** State the “should be” condition (Engineering Requirements) by referring to applicable engineering BTP document, specification, and paragraph.
  - Insufficient “Should Be” Condition: “S/B No damage per Engineering.”
  - Accurate “Should Be” Condition: “S/B No galling per 2ZZP00003, paragraph 3.12”
  - NOTE: Each drawing feature/dimension and/or Specification requirement that is out tolerance should be a new discrepancy. (i.e., A new discrepancy for each “Should Be” condition) Identify multiple non-conformances with the same “Should Be” condition with the NC number plus an alpha identifier beginning with “A”, i.e. NC 1A, NC 1B, etc)
8. **Aircraft Tail Numbers:** For suppliers with access to Northrop Grumman effectivity codes: enter the Northrop Grumman effectivity code (“tail number”) for the unit on which the discrepancy was found. (Does not apply to detail part/subassembly suppliers)
  - Example: “Unit: 2AF:00038”
9. **Part Location:** If the discrepant part is not within the Supplier’s facility (e.g. at a sub-tier supplier) state so within the discrepancy text.
  - Example: “Part is at National Machine”
10. **Repetitive SMRR History:** If the exact discrepancy currently being documented has occurred on *previous* parts, list one or two of the most recently submitted SMRR numbers for the condition in the discrepancy text. Supplying this information will **greatly** reduce the time to receive an SMRR disposition from the NGC MRB.

- Example: “Repetitive SMRRs: ES-012345, ES-678910”
  - A “repetitive” SMRR is one that has occurred on the exact same part number (dash number included) in the exact same location, and is of equal or lesser magnitude as the current non-conformance.
11. **Part SMRR History:** If the *current part* has experienced previous non-conformances during its manufacturing process, list all of the previous tag history in the discrepancy text. This information is vital to ensure that the NGC MRB member evaluating the non-conformance has a comprehensive understanding of the part condition, and will reduce the frequency with which tags are re-opened for failed repairs or additional information.
- Example: “Other SMRRs on this part: ES-012345 (cure error), ES-678910 (machining)”
12. **Supplier Non-Conformance and Part Serial Numbers:** In order to facilitate communication between NGC and its Suppliers, it is beneficial to include the Supplier’s internal Non-Conformance Numbers (“QARs”, “Tags”, “NCs”, etc) and Part Serial Numbers in the discrepancy text.
- Part Serial Numbers are the unique part identifiers used to track individual parts through a production facility, also known as “Work Orders”, “SOIR numbers”, etc.
  - Example: “Global Composites QAR Number: NC-1234”
  - Example: “Global Composites Part Serial Number: F00013”

**Create Discrepancy (part#: C92157-1)**

\*PART NO: C92157-1  
SERIAL NO: N/A  
LOTNO / LDC: N/A  
\*SHEET/PARAGRAPH: 1  
\*ZONE: 2B  
\*QTY REJ/DEF: 1  
Process Code: D001 - Visual / Physical  
Defect Code: V19 - DIM - OVERSIZE / UNDERSIZE

\*Disc Text:  
Blue print dimension should be 1.00 +/- .010 dimension actually is 1.025

Add Cancel

Figure 1 Discrepancy Text Field in MES-NC

## B. Uniform Discrepancy Text Template

In order to ensure that all relevant pieces of information are contained within the SMRR, suppliers are encouraged to develop a standard company template for composing discrepancy text. One example is given below. See also, Attachment A – Tag Writing Checklist.

X( ), Y( ), Z( )

During (process) of the (part number), (part name), (criticality code), (discrepancy) was found at (location).

IS: (discrepancy magnitude)  
S/B: (allowable magnitude) per (governing document)

Part is at (sub-tier supplier)

Repetitive SMRRs: (SMRR number)  
Other SMRRs on Part: (SMRR number)  
Internal NC Number: (internal NC number)  
Internal Serial Number: (internal Serial number)

Figure 2 Discrepancy Text Template, Blank

Through the use of a discrepancy text template it can be seen that all relevant information can be submitted on an SMRR in a compact and efficient format. Adherence to this template form (or similar) minimizes the opportunity for SMRRs to be returned to suppliers for additional information, which often results in undesirable delays in non-conformance processing.

IS: .350”  
S/B: .450”

See attachment.

Figure 3 Discrepancy Text, Discouraged Format



X(257.3), Y(-15.8), Z(115.5)

During automated drilling of the 2CSH12345-0057, Skin, Panel, Access (MC), short ED was found at hole 135, 1.5" from FWD stiffener. See attachment for details.

IS: ED is .350"

S/B: .450" min. per Note 19 of Notes List

Unit: 2AF:00065

Repetitive SMRRs: ES-012345

GC QAR Number: NC-01234

GC Serial Number: F00013

**Figure 4 Discrepancy Text, Preferred Format (Per Template)**

By supplying the minimum amount of discrepancy text information as defined in the MES-NC OASIS Training (SMRRs) work instruction (see Figure 3, above) a supplier reduces the amount of time spent during SMRR documentation but can inadvertently, and disproportionately, increase the amount of time required to receive a final disposition. Although the former are acceptable per NGC documentation and processes, it is highly beneficial to supply SMRR discrepancy text in the preferred data-dense format (See Figure 4, above). This level of detail allows the NGC MRB to implement time-saving tools that leverage previous SMRR history and reduce disposition time significantly.

#### **IV. SUPPLIER RECOMMENDED DISPOSITIONS**

Suppliers are encouraged to submit "recommended dispositions" with each SMRR submission. On occasion, NGC MRB dispositions cannot be performed by the Supplier due to limitations in material/part inventory, processing capability, or other practical hindrances. In these instances, the NGC MRB disposition is returned to NGC and an alternate disposition is requested, resulting in loss of productivity by all parties. The Supplier Recommended Disposition serves as a means to avoid these delays by communicating to NGC the most suitable repair for the capabilities and hardware available to the Supplier. The NGC MRB will consider and implement the supplier recommendation when feasible and appropriate.

It should be noted that the Supplier Recommended Disposition is a powerful tool that allows the Supplier to influence the outcome of non-conformance dispositions and can greatly reduce tag processing time by the NGC MRB.

Supplier Recommended Dispositions are always beneficial, and can be particularly effective in instances when:

- Fasteners or other repair materials are limited
- Cost dictates preference for a particular repair
- Process capabilities or capacity dictate preference for particular repair
- Schedule dictates preference for a particular repair
- Complex non-conformances that can benefit from Supplier's first hand observations

#### **A. Supplier Recommended Dispositions Requirements**

1. Should be submitted as an SMRR attachment in MES-NC or sent via FileDrop at the time of SMRR submission. The Supplier may contact their Northrop Grumman buyer or representative to request access to FileDrop.
2. Should contain a detailed recommended disposition that fully addresses the non-conformance, using specific engineering callouts and graphics, as applicable.
  - Insufficient Recommendation: "Bush the discrepant hole."
  - Clear Recommendation: "Bush discrepant hole per NGC SRM E0-0609M Revision H, Standard Disposition SD2001-4." (Note: disposition recommendations are **not** limited to NGC Standard Dispositions.)
3. Must prominently display the words "Supplier Recommendation – For Reference Only" at the top of each page. See Attachment B – Recommended Disposition Template.
4. Must contain a watermark diagonally across each page that reads "For Reference Only – Supplier Recommendation." See Attachment B – Recommended Disposition Template.

## References

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<b>Corporate</b>	None
<b>Sector</b>	None
<b>Former Division</b>	None
<b>Other</b>	MES-NC OASIS Training (SMRRs) Supplier Quality Assurance Requirements (SQAR)
<b>Forms</b>	None

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## Attachment A – Tag Writing Checklist

The Tag Writing Checklist is provided as a desktop aide for ensuring that all relevant pieces of information are included in the discrepancy text of a non-conformance report.

### Basic Information That Should be Present in the Text of a Non-Conformance Report

(Failure to provide this data will often result in an “Interim” disposition for additional information or a delayed disposition response)

- Manufacturing Operation: “During NDI”, “During PMM”, “At Sequence XXX”)
- Part Number/Part Name
- Part Criticality: FC, FCT, FCNT, MC, HCI, SC, MAC, DC. (Include Serial #)
- Discrepancy Type, Description
- Discrepancy Location
  - List the X Y Z location of the affected area. Always required for assemblies, but not sufficient alone. Optional for detail parts.
  - Description of location in words as it relates to “landmark” features.
  - Dimension of defect location from part edges/features.
- State the “Is” condition with actual measurements/dimensions.
- State the “Should Be” condition by referring to the applicable BTP document, specification, and paragraph.
- Aircraft Tail Number (for Assembly defects, if available)
- Part Location (if at sub-tier supplier)
- Repetitive SMRR numbers
- Previous SMRR number on part
- Supplier Non-Conformance and Part Serial Numbers

### Attachment B – Recommended Disposition Template

This template is provided for the Supplier’s convenience when submitting SMRR recommended dispositions. The PowerPoint format allows for flexibility in providing text and graphics as deemed necessary by the Supplier.

SMRR-XXXXXX

Date: MONTH/DAY/YEAR

Prepared by: First Name, Last Name  
Supplier Name:  
Email:  
Telephone:

Supplier Recommendation

**FOR REFERENCE ONLY**

This is a Supplier Recommendation only. Please refer to the MRB-approved disposition in MES for all non-conformance disposition instructions.

1

Supplier Recommendation – FOR REFERENCE ONLY

SMRR-XXXXXX, First Name, Last Name

ENGINEERING DISPOSITION:

PROVIDE DISPOSITION TEXT/GRAPHICS HERE. USE ADDITIONAL PAGES AS REQUIRED.

For Reference Only  
- Supplier Recommendation -

2

### Attachment C – Common Non-Conformance Discrepancy Data

In addition to the information provided in Section III, some common non-conformances require specific information to be successfully dispositioned. In an effort to anticipate these needs, below is a reference table that will assist the SMRR author to include this information upon initial SMRR submission, thus avoiding follow-on requests for data.

**Table 1. Common Non-Conformance Discrepancy Data**

DISCREPANCY TYPE	PREFERRED DISCREPANCY DATA
Cure Failures	Cure records, including data showing which transducers and thermocouples are attached to the affected part Description of all out of scope conditions, their durations, and how far into the cure they occurred Visual inspection of part for surface anomalies (resin starvation, surface porosity, blistering, edge delaminations, evidence of lack of compaction, etc)
Delaminations/Disbonds/Unbonds & Splintering	Map damage via NDI Detailed length, width, and depth dimensions, and if possible, the number of structural plies affected Pictures of non-conforming area and part overview, as applicable, showing the defects. Include a scale for reference
Edge Trim	Hole spacing and edge distance impacts if fasteners are adjacent to an out of tolerance edge trim condition
Electrical Bonding - Jumper Straps	Length, size, and type of strap Procedure and location for measuring resistance Interfacing part numbers and subsystems
Electrical Bonding - All Other	Interfacing part numbers and subsystems Detailed pictures of the affected area Detailed shim information (if any): type, material, thickness
Failed Lab Test	All test results and applicable data for failed property Supplier certification data Notes and pictures for any unusual features seen on test specimens (e.g., voids present in failure, wrong failure mode, etc) Manufacturing data for the test specimens (e.g., cure records, NDI records, etc)
Fastener Holes	Hole spacing and edge distance impacts in all parts involved Fastener tilt angle (if applicable) Part number and quantity of fasteners in joint
Foreign Material	Depth and size of any foreign object/material defect Sketch/photo of discrepant area with sufficient detail and dimensions such that the defect can be recreated in a 3D CAD system

**Attachment C (Continued) – Common Non-Conformance Discrepancy Data**

**Table 1 Continued: Common Non-Conformance Discrepancy Data**

<p>General</p>	<p>Accurate Process Codes, Defect Codes, and Defect Quantities (avoid "Other") A clear picture of all parts impacted showing defect location so it can easily be identified in a CAD model or Visual Aid. Measurements to any nearby features (e.g., hole, radii, edge of core, edge of part, etc) All impacted part numbers</p>
<p>Heat Treatment</p>	<p>Detailed heat treatment records, including data on which thermocouples are attached to the affected part Description of out of specification conditions, their durations, and how far into the process they occurred</p>
<p>Incorrect Material</p>	<p>Pictures showing where incorrect material was used Certificate or test results (hardness, conductivity, strength) for material used</p>
<p>Missing Material (Composites) (Fiber Breakout, Gouges, Scratches, Damaged/Missing Plies, Splintering, etc)</p>	<p>Detailed dimensions of defect: length, width, and depth Number of plies that have been affected Type of plies affected: Structural, ECF, sacrificial, etc. Close-up pictures of defects, with a scale in the view to provide a dimensional reference Pictures of the entire part showing defect locations</p>
<p>NDI/NDT</p>	<p>Copy of NDI/NDT records (C-Scan or photo of X-ray) with anomaly and relative attenuation clearly indicated Inspection Method: Broad Band, Narrow Band, Pulse-Echo, etc. Images of part with defect indicated (may be a drawing/sketch/CAD image or photograph). Dimensions of the defects: length, width, and depth Type of defect: Void, Porosity, FO, etc. Results of any secondary inspections performed (A-scan, X-ray, etc)</p>
<p>Out Time Expired</p>	<p>Temperature recorder data and the time /date material was removed from packaging For temperature recorder failures: provide evidence that dry ice was in container, record of refrigerated shipment from shipper, and total time. Total time material was above specification limits</p>

**Attachment C (Continued) – Common Non-Conformance Discrepancy Data**

**Table 1 Continued: Common Non-Conformance Discrepancy Data**

Overheating Part/Material	<p>Dimensions of damage and discoloration, including discoloration depth (by visual inspection from edge)                  Temperature and length of exposure seen by part                  Source of heat                  Describe non-typical processing operations that may have caused non-conformance (e.g., Repairs, strain gage installations, accelerated curing, etc.)                  Note any damage to adjoining materials, such as bubbling or discoloration of coatings or sealants                  Any NDI results for interior delaminations (composite parts)</p>
Steps/Gaps/Mismatched/Cavity Depth	<p>Photos showing out of tolerance condition dimensions along part edge. Values can be written at 1"-2" intervals on masking tape, showing (+) values where part is high and (-) values where part is low.                  Measured thickness of parts at discrepant areas</p>
Thickness	<p>Photographs showing measured out of tolerance thickness value marked directly on non-conforming location/part                  Where possible, provide measured thickness of part before paint/coating application. If part has been painted/coated, provide worst case thickness of paint/coating in addition to part thickness.</p>
Weld Anomalies	<p>Copy of routing slip or shop traveler to showing sequence of operations performed</p>
Wrinkles	<p>Detailed dimensions of defect: length, width, and depth                  Number of plies that have been affected                  Type of plies affected: Structural, ECF, sacrificial, etc.</p>