

AAR/RSI QUALITY NEWSLETTER

Volume 2, 2nd Quarter 2017

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AAR AND RSI QUALITY ASSURANCE COMMITTEES

Submitted by Jaimie Ryan – Union Pacific and Donna Jacobi – Amsted Rail

The RSI Quality Assurance Committee (QAC) is an advocate for quality and continuous improvement in the performance and safety of the rail supply industry's products and services. This group is composed of quality leaders from RSI member companies, and includes representatives from car owners, fleet managers, repair and reconditioning facilities, and car and component manufacturers.

The RSI QAC charter is to proactively identify industry issues, needs, and trends and provide guidance and service offerings to continually improve railway supplier products, processes, and services. This is accomplished by developing and publishing best practice industry compliance standards, documents, and guidelines, and educating the industry on quality issues and processes. In addition, the RSI QAC acts as a liaison, resource, and educator to industry stakeholders.

The objective of the AAR QAC is to improve component reliability and durability with the goal of enhancing the safety and operational integrity of interchange freight cars and to reduce the overall cost of equipment maintenance by assuring that both new and reconditioned mechanical components conform to established AAR specifications.

The AAR QAC is responsible for:

- Overseeing the AAR Quality Assurance Program
 - Developing and maintaining AAR MSRP Section J, M-1003, Specification for Quality Assurance
 - Certification and training of AAR Auditors
 - Certification of Companies to the M-1003 Quality Specification - examination of a supplier's quality management system and the effectiveness of implementation, followed by certification, and compliance audits to maintain the certification
- Tracking material nonconformances
 - Reviewing, accepting and rejecting chapter 7 nonconformance reports.

The AAR QAC has 7 authorized Railroad Members and works closely with supplier organizations (Railway Supply Industry and Institute of Supply Managers) to meet the requirements of the railroad industry.

Union Pacific, Burlington Northern Santa Fe, Amtrak, CSX Transportation, Norfolk Southern, and Canadian Pacific all have members on the QAC.

The AAR QAC can answer questions concerning AAR's M-1003 Quality Assurance Specification including: interpretations when needed, auditor accreditation, facility certification, and material rejection reporting processes.

Members from both the AAR QAC and the RSI QAC joined a Technical Action Group (TAG) to develop methods of communicating industry related quality topics, including revisions to quality specifications, answers to frequently asked questions, upcoming events, and providing views and interpretations. The output of the Communication TAG is this newsletter. Previous editions of the newsletter are available on the RSI QAC webpage (<http://www.rsiweb.org/qac>).

AAR M-1003 CHAPTER 7 NONCONFORMANCE REPORTING

Submitted by Miles Lucero - Transportation Technology Center, Inc.

The objective of nonconformance reporting is to document and provide traceability of the failure of a material, product or service provided by an M-1003 certified facility. Further, it is to document the material's disposition, the corrective action taken to ensure that the root cause of the failure is eliminated, and the follow-up action initiated to ensure that the corrective action is effective and permanent.

The Quality Assurance Nonconformance Report Form (QA-7.1), the Quality Assurance Nonconformance Response Form (QA-7.2), and the Quality Assurance Nonconformance Response Evaluation Form (QA-7.3) must be used by railroads, private car owners, car builders, shippers, and companies authorized to do manufacturing, modifying, requalifying, repairing, reconditioning, or remanufacturing of a material or service described in the AAR's Manual of Standards and Recommended Practices.

When referring to Chapter 7 requirements, there are two important definitions to keep in mind:

Initiator – The company or organization that identifies and reports the failed material, product, or service. This can be both certified, and non-certified facilities.

Contractor – An M-1003-certified manufacturer, supplier, or reconditioner that provides a nonconforming material, product, or service and is responsible for responding to the QA-7.1.

Here are the basic steps in the Chapter 7 nonconformance reporting process:

1. Initiator submits QA-7.1 within 30 days of identifying the nonconforming material. Initiator should complete all fields in the QA-7.1 as thoroughly as possible. After all fields are complete, click the Submit button. Once submitted, AAR and contractor are automatically notified.
2. Contractor reviews disposition of the nonconforming material, and submits a QA-7.2 within 60 days of the initiation date of the QA-7.1. AAR and initiator are automatically notified.
3. Initiator evaluates the response on the QA-7.2, and submits a QA-7.3 within 30 days of submission of the QA-7.2. AAR and contractor are automatically notified.
4. If the initiator determines that the QA-7.2 was incomplete or did not fully address all five corrective action steps, the contractor will have 30 days to revise and resubmit the QA-7.2.
5. After the initiator accepts the QA-7.2 response, the AAR Quality Assurance Committee (QAC) reviews all reports for appropriateness. If the

QAC feels that the response is not acceptable, they may reject the response and the contractor must revise the QA-7.2. If the response is acceptable, the QAC approves and the QA-7.1 is now considered closed.

The 2016 revision of M-1003 requires that all Chapter 7 forms must be submitted electronically at <http://aar.iirx.net>. The online submittal of these forms has many benefits, including automated

VIEWS AND INTERPRETATIONS

This section will bring you answers each issue to some frequently asked questions.

Q: *Are welding machine amp and volt meters, wire feeders and shielding gas regulators required to be calibrated and documentation maintained?*

A: Welding machine output (amperage and/or voltage) must be verified using nationally recognized/traceable standards. Wire feed speed must be verified using nationally recognized/traceable standards or by verifying amperage and voltage when the contractor's equipment simultaneously controls wire feed speed and amperage. Records must be maintained to satisfy the requirements of paragraph 2.8 in the specification.

Shielding gas-flow devices do not require nationally recognized verification/calibration~ess the product specification, contract, design requirements, or contractor's quality assurance program specifies verification/calibration.

notification to the proper parties, and easy data retrieval for trend analysis. The data can then be shared with the appropriate AAR Technical Committee to help them make smarter decisions for the components that their committee oversees. Overall, the Chapter 7 nonconformance reporting process is meant to improve component safety and reliability, a goal that we should all strive for as railroad quality professionals.

Q: *Does the requirement of M-1003. Paragraph 2.8.7 to assess and document the validity of previous inspection and test results when measuring and testing equipment are found to be out of calibration apply to welding machines?*

A: Welding equipment: paragraph 2.8.7 in the specification (to assess and document the validity of previous inspection and test results when measuring and testing equipment are found to be out of calibration) will not be applied to welding machines. Welding machines should be covered by the criteria in paragraph 2.15.8 of the specification.

Have a question? Submit your M-1003 request for clarification or interpretation by emailing QA@aar.com.

THANK YOU TO OUR HOST FACILITIES

Submitted by Miles Lucero - Transportation Technology Center, Inc.

The AAR's Transportation Technology Center, Inc. offers several training courses throughout the year that focus on quality auditing to the M-1003 Specification. One such course is the M-1003 Advanced Auditor Training. As part of this course, attendees are invited into a host facility to perform a one-day, mock M-1003 audit.

We would like to sincerely thank

BNSF Havelock Shops in Lincoln, NE
and
Progress Rail Services in Boaz, AL

for generously welcoming in our most recent Advanced Auditor classes. It is through training courses like these that quality is emphasized and propagated throughout the industry.

We are currently seeking volunteer facilities for our 2018 Advanced Auditor Training Courses. To learn more about the benefits of hosting an Advanced Auditor Training Course, contact QA@aar.com.



ELEMENT 2.5 – PRODUCTION, INSPECTION AND TEST PLANNING

Submitted by Gary Alderson – AllTranstek, LLC

One of the most important requirements in your quality program is the description of your inspection and test plan. While there are many important elements in Chapter 2 of AAR Specification M-1003, the planning of where to perform inspection and tests, along with mandatory process hold points, is a great place to start when building your quality program. Additionally, you can revisit your quality program for the purpose of improving your processes.

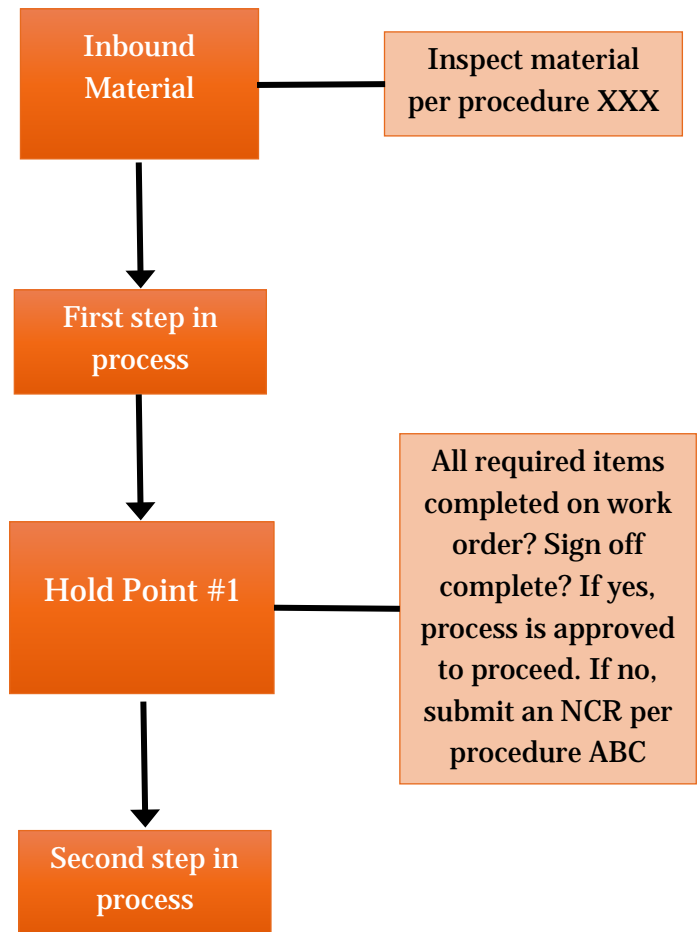
The first step is laying out the entire process from incoming material inspection to final inspection on a white board or on paper. You may begin by drawing the flow of the process and then add hold points. We also need to describe the actions required when we discover the inspection or test was not completed at the prescribed process hold point.

The layout of the process should look similar to the example shown, but should be customized to fit the needs of the user.

The flow chart can be a sophisticated chart with process arrows and other flow chart symbols, or it can be a simple block diagram as shown here. The idea of the layout is to understand where in the process you need to define a hold point that will allow you the opportunity to review the component or item and decide if the requirements up to that point in the process are complete and correct. When you have laid out all the steps in the process, you can determine how many hold points are needed to capture all of the required inspections and tests.

Remember that you are determining process hold points, not physical hold points. If you find the component or item beyond a particular process hold point that has a nonconformance or incomplete item, you will be required to write a noncompliance report (NCR) per your company corrective and preventive action procedure as required in element 2.6

The concept of process hold points is to allow you to build the quality into the component or item as it progresses through the manufacturing or repair/reconditioning process. If all the process hold points are verified by personnel assigned the inspection duties per your quality assurance program, you should have very minimal items to complete at final inspection. When you do find a



nonconformance at final inspection you can address it with your NCR process and determine the root cause, corrective and preventive action to permanently prevent it from happening again.

The completed flow chart can be used in your QA manual as an exhibit or incorporated into Element 2.5 in the body of the manual. The process hold points and descriptions can be reviewed regularly to maintain accurate identities of the processes.

AVOIDING COMMON AUDIT FINDINGS IN DOCUMENT CONTROL AND MEASURING AND TEST

Submitted by Bob Wolbert – Progress Rail

The 2016 M-1003 audit findings told a recurring story in which Document Control and Measuring and Testing Equipment (MTE) were number 1 and 2 respectively as the two most common audit finding elements. Why and what can you do to prevent this at your facility?

Auditors routinely sample documents and MTE as they proceed through the audit process. As the auditors collect their objective evidence at a work station, they have a couple of opportunities for findings to be realized

on the shop floor or upon returning to the office. Let's take a look at some of these and what you can do to reduce the potential of an audit finding in your facility.

Common Document Control Fails

1. Document(s) not kept current:

- a) Organize controlled documents by location on your master document list.
- b) Update documents promptly. Don't set to the side and allow them to become buried under other items in your work area.
- c) Use a printed master document list as a checklist for updating a document by highlighting / marking off each location as completed. Make the required number of copies to replace the document at all posted locations per the master document list.
- d) Only change dates on master document list dates after all documents have been replaced.
- e) Audit other documents in the work areas while there replacing the document affected.
- f) Develop a system for revising and reissuing documents to make changes more manageable. For example, revision bars alongside of changes made in addition to a revision history detailing changes made. Reissue a document in a timely manner per your document control procedure.
- g) Schedule incremental document reviews in a targeted method to make them easier to accomplish and with a higher degree of accuracy. For example:

Jan – Verify MSRP's are current with applicable circular updates per AAR web site; Verify AAR Field Manual Rule 1 publication dates; Audit Publications in Work Area 1.

Feb – Verify external documents for Special Processes – Heat Treat, Blast and Paint, etc.

2. Document not controlled or available in work area:

- a) Review your MSRP / technical specifications for any required documents to be posted or present in a work area
- b) Any document affecting quality must be controlled and listed on the master document list. You cannot post uncontrolled copies of documents that affect quality. Examples: AAR required postings; MSRP excerpts; Paint (SSPC) and Blast (NACE) postings; etc.
- c) Keep documents in reasonable proximity to their intended point of use and avoid excess documents through strategic locations.

Common Measure and Testing Equipment Fails

1. Illegible or missing calibration tag, sticker or other suitable indicator

- a) Ensure employees start each shift with cleaning and inspecting MTE visually for missing / illegible status indicators and reporting any issues when found.

- b) Address problem calibration indicator MTE items with alternative methods of identifying calibration status such as labeling the MTE box, shadow board location, etc. so that the calibration status is known to all using this device while safeguarding the legibility of the calibration indicator.
 - c) Review MSRP Section J appendix C for additional information / interpretations on calibration requirements.
2. Inaccurate calibration indicator
- a) Utilize MTE software with print label option coupled to the item's calibration document.
 - b) If you must use handwritten labels or labels printed from an independent source, double check against the calibration document.
3. Calibration performed against certified equipment having a known valid relationship to a nationally recognized standards
- a) This can be accomplished by providing NIST numbers on the calibration document for equipment used to calibrate / adjust the MTE.
 - b) Providing evidence of traceability to other than NIST for example ISO, A2LA, etc.. by having the calibration supplier's current certificate on hand as objective evidence.

ROOT CAUSE ANALYSIS CASE STUDY – CASTING INCLUSION

Submitted by Andrew Lindgren – Amsted Rail

Define:

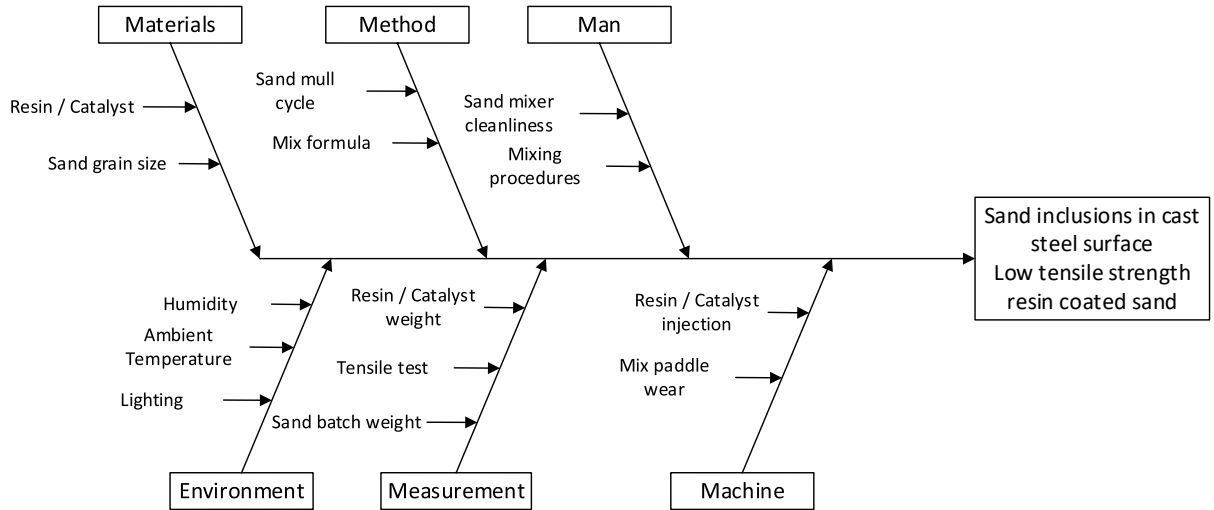
A Foundry was experiencing sand inclusion rejection at the primary inspection hold point in their process. The internal inspection reject rates for sand inclusions were unstable and had been persistent. This was problematic for the plant because the inclusions were in a region of the casting where they could not be repaired. The problem was approached several times trying varying solutions to the problem, but none were successful in reducing the rejections and sustaining it. With the internal metrics for cost and productivity both heading in the wrong direction it was time to try a more systematic approach for the root cause analysis!

Measure:

A team was assembled for analysis including operators, process experts, engineering, maintenance, and operations. Using a team of associates from numerous disciplines and responsibilities gave the analysis a broader perspective. The team opted to use the Fishbone diagram because of familiarity and ease of use. Using the standard Man, Method, Machine, Materials, Measurement, and Environment headers helped to guide the team's efforts in identifying possible causes to the issue.

Analyze:

The fishbone diagram was compared to the control plan for the sand mixing process, enabling the team to thoroughly consider all documented possible causes. For the remaining possible causes, they developed a list of items for each team member to evaluate. The team's efforts uncovered two non-conformances that either didn't meet current specifications or were believed to be problematic. The first was with the consistent distribution of resin / catalyst while the second was believed to be with the mix formula.

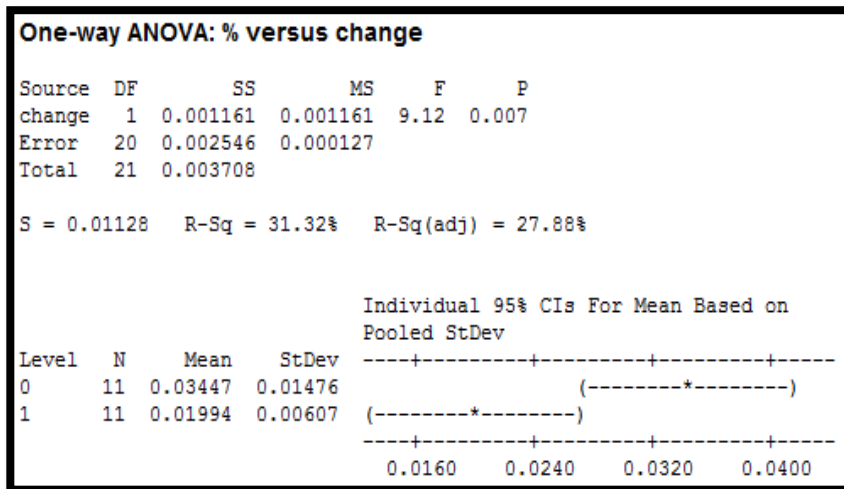


Improve:

With these two non-conformances identified, the team set out to evaluate the effect of each. The consistent distribution of resin / catalyst was addressed by replacing solenoid valves that controlled the flow of this material. Although the team saw an immediate improvement in the reject rate, it was also necessary to address the second cause. Therefore, the plant reformulated the mixture to improve strength while maintaining the other key characteristics using data provided by the manufacture of the resin / catalyst system. Please note that the entire corrective action plan was not discussed in this summary.

Control:

The systematic approach to inspect / measure each of the probable causes resulted in the plant finding the ultimate root cause(s). Next, the team developed suitable corrective action plan(s) and implemented them. An example of one corrective action included changes to the PM (Preventative Maintenance) program for the inspection / replacement frequency of the solenoids. The process changes and improvements were then verified using statistics. An ANOVA (Analysis of Variance) analysis results showed a P-value less than 0.05 and confidence intervals that excluded each other. Both of these support the conclusion that the corrective actions were effective in reducing variation and shifting the mean.



CALENDAR OF EVENTS AND IMPORTANT LINKS

2017/2018 Calendar of Events

Training	Date	Location
AAR Quality Auditor and Industry Conference	Week of Jan. 22, 2018	Fort Worth, TX
Basic Auditor Training	July 18-20	Anaheim, CA
	Sept. 26 - 28	New Orleans, LA
Advanced Auditor Training	August 8-10	Waskom, TX
	Nov. 7-9	DeCoursey, KY
Root Cause & Corrective Action	July 11 - 12	Pittsburgh, PA

Important Links

[Registry of M-1003 Certified Companies](#)

[M-1003 Frequently Asked Questions](#)

[AAR M-1003 Certification on-line Application](#)

[AAR M1003, Section J Specification for Quality Assurance](#)

[AAR Training Schedule](#)

[MSRP Publication Current Revision Status](#)

[AAR Circular Letters](#)

[AAR Online Material Nonconformance Reporting System \(Chapter 7\)](#)

[Railway Supply Institute](#)

[American Society for Quality](#)

The AAR /RSI Joint QA Newsletter is provided through the efforts of AAR Quality Assurance Committee and Railway Supply Institute Quality Assurance Committee members in an effort to provide information that is important to our industry in support of improving the quality of products and services provided. You can support this process by submitting your questions and ideas for improvement to QA@aar.com.

THE FOLLOWING AAR QAC AND RSI QAC TEAM MEMBERS WORKED ON THIS NEWSLETTER AS PART OF THE COMMUNICATION TECHNICAL ADVISORY GROUP:

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