Structured Problem Solving

8D-Root Cause Analysis and Corrective Action Implementation

TACTAIR

Mission Statement

At Young & Franklin and Tactair Fluid Controls, our mission is to prevent problems and continually improve through the involvement of all suppliers.

Expectations

We have developed the following training document to explain our expectations for corrective actions and give guidelines to ensure corrective actions are robust.

This document is for reference only and does not supersede official communication.

Quality Rejection Process: Flow

Quality Rejection Process: Accounting

Accounting pays for accepted parts only.

Receiving Inspection Rejections

- Parts returned without payment
- Line item added to the PO for repair/replacement
- Re-invoice and payment issued after acceptance of parts

Manufacturing, Assembly & Testing Rejections

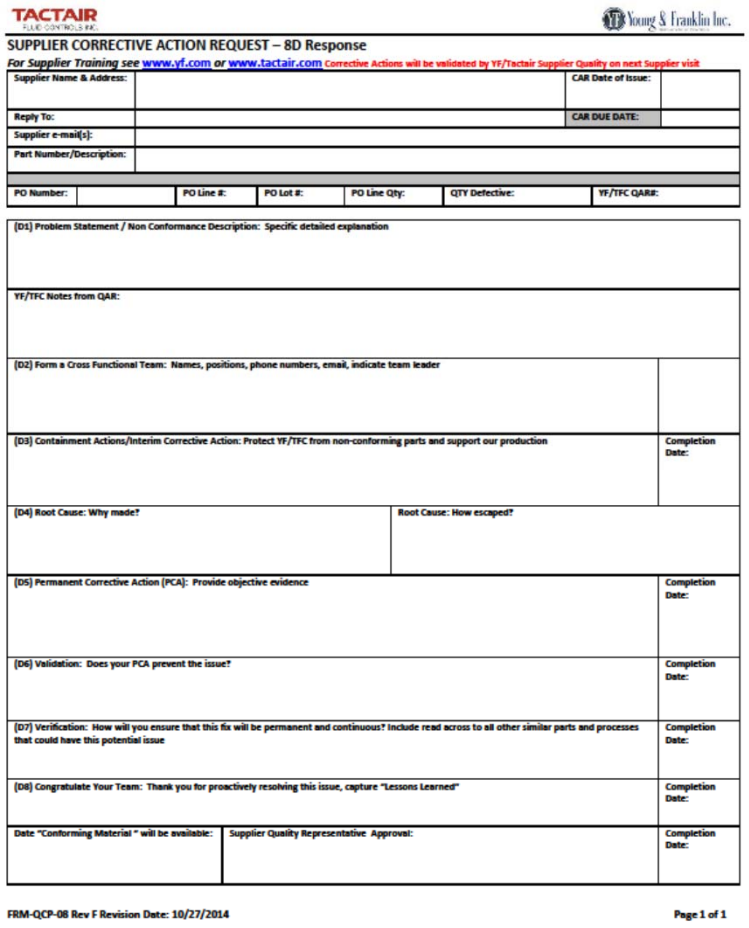
- Parts returned as Y&F/Tactair-owned material
- Vendor Quality purchase order (VQxxxxx) for repair/rework/replacement
- No invoicing required unless returned for credit and then a Debit Memo will be issue

Quality Rejection Process: Communication

- Your Buyer is your Point of Contact.
- You will receive a CAR Letter from your buyer.
- Please submit your response directly to your buyer via email attachment.
- Contact a Supplier Quality Engineer (SQE) with questions or requests for additional information.
- Copy your buyer on **ALL** communication.

Quality Rejection Process: CAR Form

- Use our form unless your internal system requires use of your own.
- Ensure your response addresses all sections of the Global 8D Process, regardless of what form is used.
- Our form is posted in Adobe and Word format at:
  - www.yf.com
  - www.tactair.com
- Respond electronically, if possible.



TACTAIR FLUID CONTROLS INC. — Young & Franklin Inc.

SUPPLIER CORRECTIVE ACTION REQUEST – 8D Response

For Supplier Training see www.yf.com or www.tactair.com Corrective Actions will be validated by YF/Tactair Supplier Quality on next Supplier visit

Supplier Name & Address:		CAR Date of Issue:	
Reply To:		CAR DUE DATE:	
Supplier e-mail(s):			
Part Number/Description:			

PO Number:		PO Line #:	PO Lot #:	PO Line Qty:	QTY Defective:	YF/TFC QAR#:

(D1) Problem Statement / Non Conformance Description: Specific detailed explanation	
YF/TFC Notes from QAR:	
(D2) Form a Cross Functional Team: Names, positions, phone numbers, email, indicate team leader	
(D3) Containment Actions/Interim Corrective Action: Protect YF/TFC from non-conforming parts and support our production	Completion Date:
(D4) Root Cause: Why made?	Root Cause: How escaped?
(D5) Permanent Corrective Action (PCA): Provide objective evidence	Completion Date:
(D6) Validation: Does your PCA prevent the issue?	Completion Date:
(D7) Verification: How will you ensure that this fix will be permanent and continuous? Include read across to all other similar parts and processes that could have this potential issue	Completion Date:
(D8) Congratulate Your Team: Thank you for proactively resolving this issue, capture "Lessons Learned"	Completion Date:
Date "Conforming Material " will be available:	Supplier Quality Representative Approval: Completion Date:

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Global 8D Tutorial

Basic problem solving and communication:

The next few slides detail our expectations for a process/data driven problem solving approach.

If you require assistance, please contact the buyer or SQE at Tactair Fluid Controls or Young & Franklin.

Containment

- Stop production and look.
  - Do you see this problem in your plant?
    - Ask the employees if this problem has ever occurred?
    - Sample parts, verify your process, check your records and stock.
  - Contain *all* stock.
    - Is there danger of shipping contaminated stock?
    - Sort backwards from the shipping dock to where the issue occurred.
      - Verify that all parts meet the drawing specifications.
  - Communicate the results!
    - Let us know what you found.
    - Help us determine the magnitude of the problem.
    - Do we have to make a disclosure to our Customers?
    - Use a data driven process.

24 Hour Response Communication

- You will have **24 hours** from initial notification to contain the nonconforming issue:
  - Recognition of the issue?
  - How many parts are in transit that might be non-conforming?
  - How many non-conforming parts do you have at your facility?
  - Do we have measurement correlation?
  - How many total parts at your facility?
  - How are non-conforming parts identified?
  - Discuss next steps.

Data Driven Process

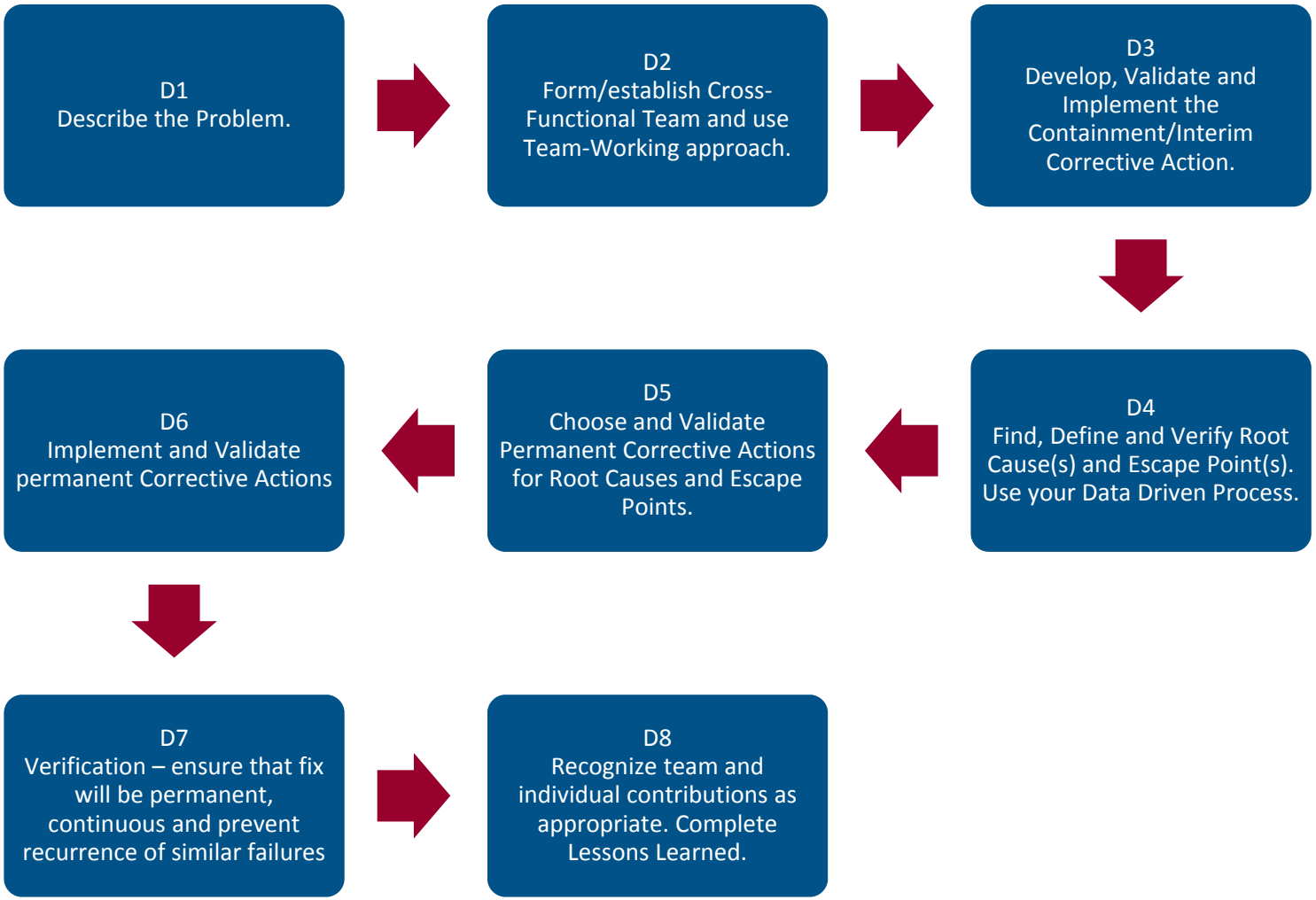
- Structured Problem Solving
  - Have you identified the real problem?
  - Did you contain it?
  - What's the root cause?
  - Did you validate it?
  - Do you have a fix?
  - Did you verify the fix?
  - Do you have a plan to monitor the fix?
  - Do any other parts run through this process?
  - Have the sub-tier or processors been notified?
- What ever process you use, it must be a formal approach.

Data Driven Process

YF/TFC's standard is the Global 8D Process.

- You can use whatever format you want to determine root cause:
  - 8D
  - 7 Step
  - 5 Why
  - PDCA (Plan, Do, Check, Act)
  - DMAIC Process (Define, Measure, Analyze, Improve, Control)

Global 8D Process



Global 8D Process

D1: Problem Statement

- Detailed description of why the part is unacceptable.
- If the problem description differs from the customer or supplier definition, both shall be recorded and identified accordingly.
- What is the print specification?
- Did we have a print violation?
- Boundary samples? (for visual, sensory defects)
- Reference to customer/industry standard?
- Have you answered: What? Where? When? How Much/Many?

Global 8D Process

D2: Form a Cross-Functional Team

- Not a team of one!
- A cross-functional team.
- Team members should be appropriate to the problem you want to solve.
- A Team Leader is “assigned to” each corrective action.

Global 8D Process

D3: Containment/Interim Corrective Action

- Use your Containment Tools from slide 10.
- Use 24 hour Response Tool Questions from slide 11.
- Don’t keep shipping suspect stock unless special authorizations are made to accept stock in the non-conforming condition via the SDWR form.
- No verbal confirmation, this communication must be in writing as a P.O. amendment.
- Can parts be reworked at TFC/YF or at your facility, or do they need to be replaced?
- Develop a plan to meet immediate production needs.

Global 8D Process

D4: Root Cause: Why Made and How Escaped?

- There are at least three root cause levels:
  - The specific root cause(s) that resulted in the problem. *Why Made?*
  - The systemic root cause – the design or manufacturing system that allowed the specific root cause(s) to occur. *Why Made?*
  - The root cause that allowed defect(s) to escape. *How Escaped?*
- What has changed? (machine, material, method, personnel, supplier, instructions, shift, print, etc.).
- Can you turn the problem on and off? Can you create the condition and remove the condition by adjusting the defined root cause(s)?
- Have you verified root cause(s) with data?
- Did you use a data driven process such as 5 Whys & 5 Hows?

Root Cause: Operator Error

YF/TFC does not accept “Operator Error”
as a root cause.

- 5 categories to focus on when you think “Operator Error” is the root cause:
  - Work Station Layout
  - Ergonomics
  - Documentation and Training
  - Tools and Machine/Equipment Assist
  - Cognitive and Attention or Perception

Global 8D Process

D5: Permanent Corrective Action

- Did we fix the problem?
- Do we have resources to correct the issue?
- Did we contain parts until the issue was resolved?
- Did we test the fix?
- Does our customer agree with the solution?
- What are short term and long term changes to permanently fix the issue?
- Updated documentation should include:
  - Travelers
  - Prints, drawings, or sketches
  - Inspection data

Global 8D Process

D6: Validate if your Corrective Action Works

- Did you test or validate your fix?
- Did you run trial parts through the system?
- Have you used data to test your fix?
- Prove that you have identified the correct root cause(s) and that the permanent corrective action taken will fix the problem forever.
- Define the validation plan (error proofing, capability study, statistical analysis, sorting activity, and/or experimentation).
- Establish a clean point by lot number, serial number and date.

Global 8D Process

D7: Verify and Monitor Ongoing Corrective Action Effectiveness

- Use your tools. LPA (Layered Process Audit). Is the fix still in place?
- What have you done to ensure your fix will be used on future production runs?
- Are procedures being followed?
- Does the system really work or did we do a great job of window dressing?
- Include a read across to similar parts and processes.
- Standardize the “fix”.
- TFC/YF will audit CAR and may do an onsite audit.

Global 8D Process

D8: Congratulate the Team

- We appreciate your team's proactive response and communication on this important issue.
- Thank your team, encourage prevention, and learn from this process.
- Establish a "Lessons Learned" database and close the loop with design engineering, quality, operations, manufacturing, and supplier management.

Quality Rejection Process: YF/Tactair's Role

- We write a Discrepant Material Report (DMR) and assign supplier responsibility with the information available at the time.
- We may change responsibility due to new information.
- We want to work with you on root cause analysis and irreversible corrective action.
- Our goal is to prevent future problems.

All QARs Count

- We do not distinguish between major and minor DMRs. Any issue will hold up customer deliveries, including paperwork rejects.
- We do categorize DMRs to help identify systemic issues.
- A “Use As Is” disposition does not mean that the issue is not important.
- When possible, we will return parts to you. If we cannot, we will send digital pictures or other supporting information.

No Repeat Issues

- The true metrics of successful corrective actions are no repeat issues and prevention of similar issues.
- Corrective actions will be assessed on their ability to help us avoid future problems.
- Corrective actions will be verified by a YF/TFC SQE upon next visit to your facility.

Structured Problem Solving

8D-Root Cause Analysis and Corrective Action Implementation

Training Complete

Thank You