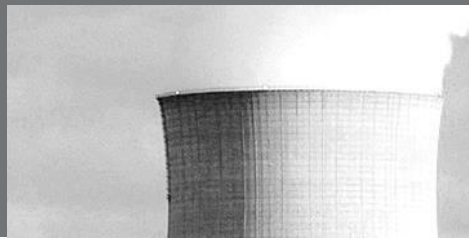
Root Cause Corrective Action

Supplier Requirements and Guidelines



Menu

Objectives

- Suppliers need to understand Curtiss-Wright Requirements
- Apply the RCCA principles and process steps needed to solver problems and prevent recurrences
- Apply the appropriate RCCA Tools to solve problems
- Create diverse teams including members from multiple functions when appropriate
- Understand how and effective RCCA process supports AS 9100 requirements.
- Effectively communicate the problem solving progress to stakeholders
- Recognise communication barriers and employ strategies to overcome them
- Establish Effective Measures of Effectiveness (MoE)
- Identify opportunities for leveraging lessons learned
- Locate resources available for additional assistance in the RCCA process

Requirements

- The supplier will be issued with a SCAR generated by TipQA. This SCAR will detail the relevant information to enable the supplier to investigate the reported issue.
- The supplier is required to investigate and communicate to Curtiss-Wright following the 8 Discipline format using the CW template (Appendix A) or the suppliers preferred document format as long as all the required elements (detailed in this document) are present.
- **Containment Action**: The supplier is to respond within 10 days detailing the appropriate Containment action including Correction of the issue.
- **Corrective Action**: The supplier is to respond within 30 days with the proposed Corrective Action plan including the Actions to prevent recurrence and the Method of Effectiveness.
- If the supplier requires additional time to submit the Corrective Action Plan then this request is to be submitted to CW Quality through their supply chain contact.
- When the Actions on the submitted corrective action plan have been completed then an updated report along with the objective evidence including the Method of Effectiveness shall be forwarded to CW Quality through the supply chain contact.
- Reviews may be set up between Curtiss-Wright and the supplier to review progress against the agreed action plan.

Curtiss-Wright Value of Quality

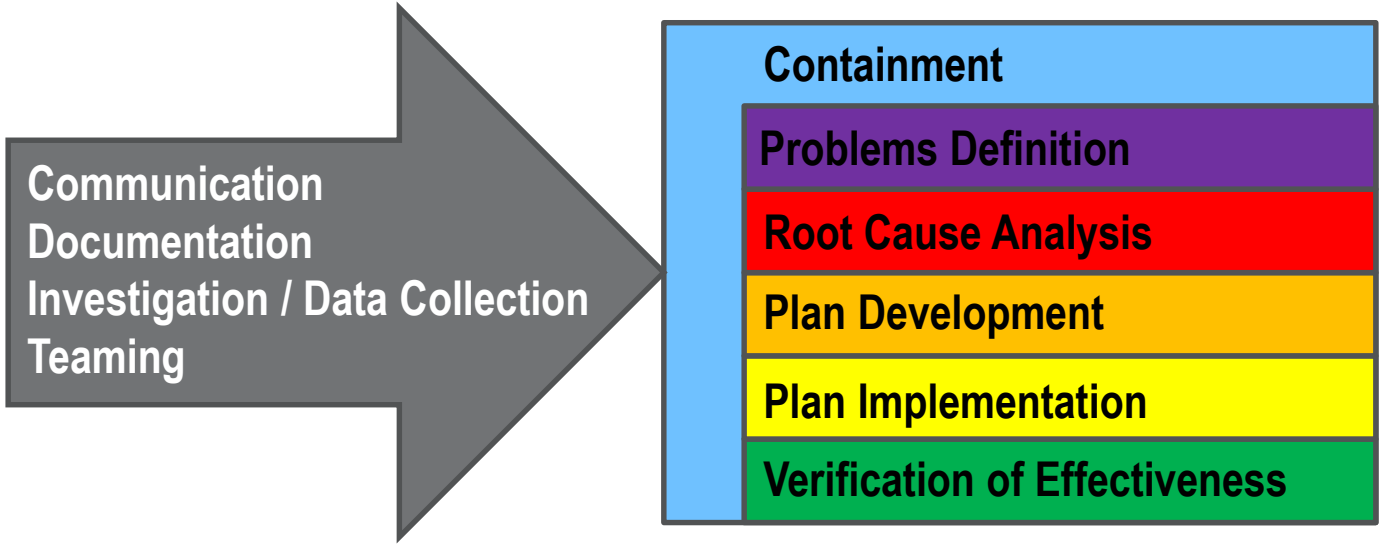
- **A mind set change ….. We must embrace**
- **Curtiss-Wright Value of Quality (CWVQ)**
- **This is a mind set that recognises the value we leave on the table due to poor quality … and the value that we can capture.**
- **Empower people to leverage their innovative spirit around integrated and holistic solutions by providing the environment, tools and methods to drive both continuous and breakthrough improvement to capture value through RCCA methodology.**

Driving Productivity to Fuel Growth

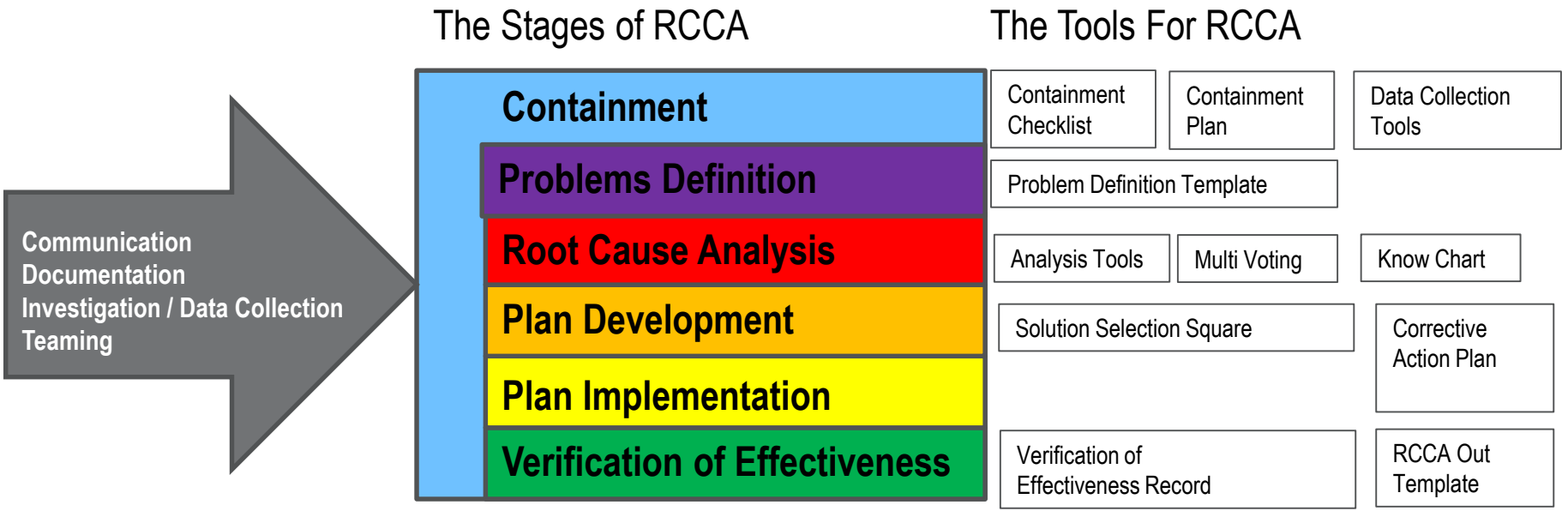
RCCA Methodology

RCCA is a structured, closed-loop methodology to:

- Determine actionable root causes of defects, non conformances and other undesirable situations
- Develop and implement corrective actions that will prevent or mitigate recurrence



RCCA Tools

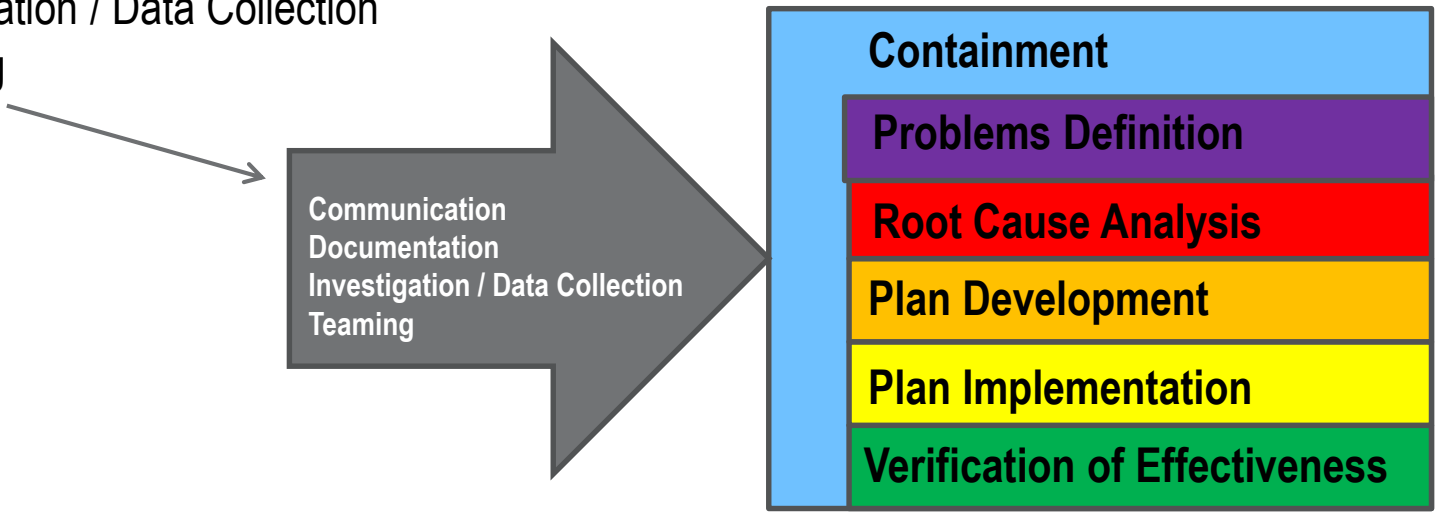


Above you will see the stages of RCCA and the tools that can be used to assist in a structured and effective completion of these stages, the use of these tools will be explained in this presentation.

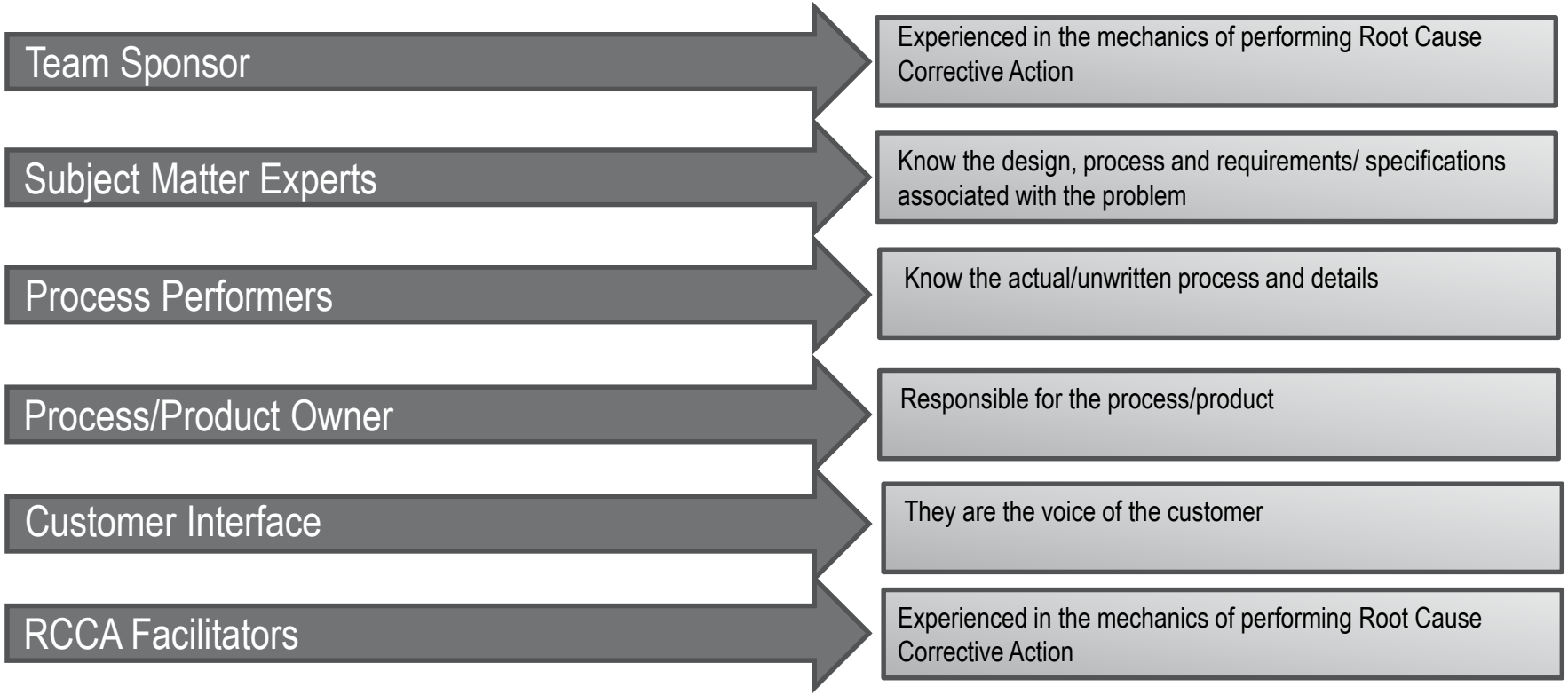
What is needed for Success ?

The four infrastructure components

- Communication
- Documentation
- Investigation / Data Collection
- Teaming



Team Composition

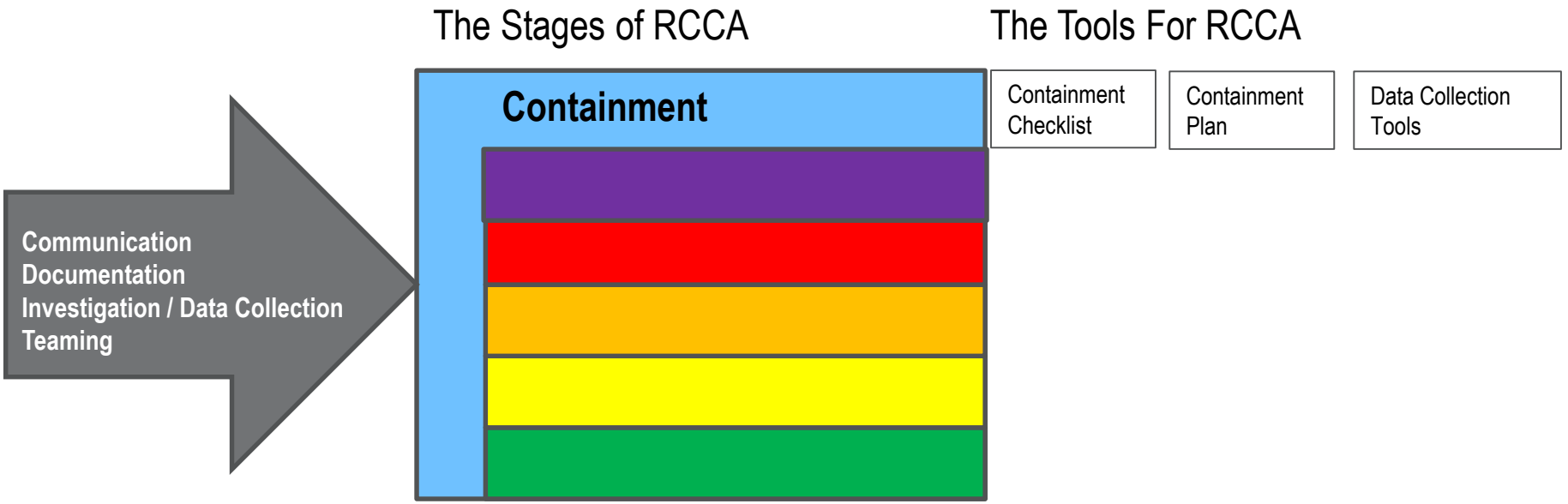


Stakeholders (persons or groups that have an investment, share or interest in something)

It is critical to keep stakeholders informed throughout the RCCA process. They need an awareness of the:

- **issues;**
- **progress, and;**
- **solution.**

Containment



Containment – What is it

Actions taken to:

- Determine the magnitude of a detected non -conformity or other un required situation
- Prevent growth of the problem
- Minimize the impact on:
  - people
  - hardware, work in progress and product
  - assets
- Consider security risks

A Genie in the bottle - Contained

Containment Checklist

Category	Action	Assignee	Date Started	Date Completed
Safeguard	Determine if there is an immediate risk to **PEOPLE** first, then **SECURITY, HARDWARE** and **ASSETS**			
Assess	Perform a quick initial investigation to define an initial **PROBLEM STATEMENT** and facilitate appropriate documentation			
Preserve	• Collect, document and preserve facts, data, information and objective evidence which may be lost of distorted with passage of time • Sequester all hardware involved in the incident or unexpected event, as appropriate			
Plan **Implement** **Verify**	• Develop a **CONTAINMENT PLAN**: Determine the actions and priorities based on assessment of risk • Define **ASSIGNEES**: Determine assignee for each containment action and get their acceptance/concurrence of action • **IMPLEMENT** the Containment Plan. Track al actions to completion • **VERIFY** the effectiveness of Containment. Monitor containment actions for effectiveness and modify action as needed			
Communicate	Identify and notify the appropriate stakeholders			
Reassess	Reassess the need for additional containment throughout the process if the investigation/data collection indicates a need			

Containment Plan

Safeguard | Assess | Preserve / Plan | Plan/Implement/Verify | Communicate | Reassess

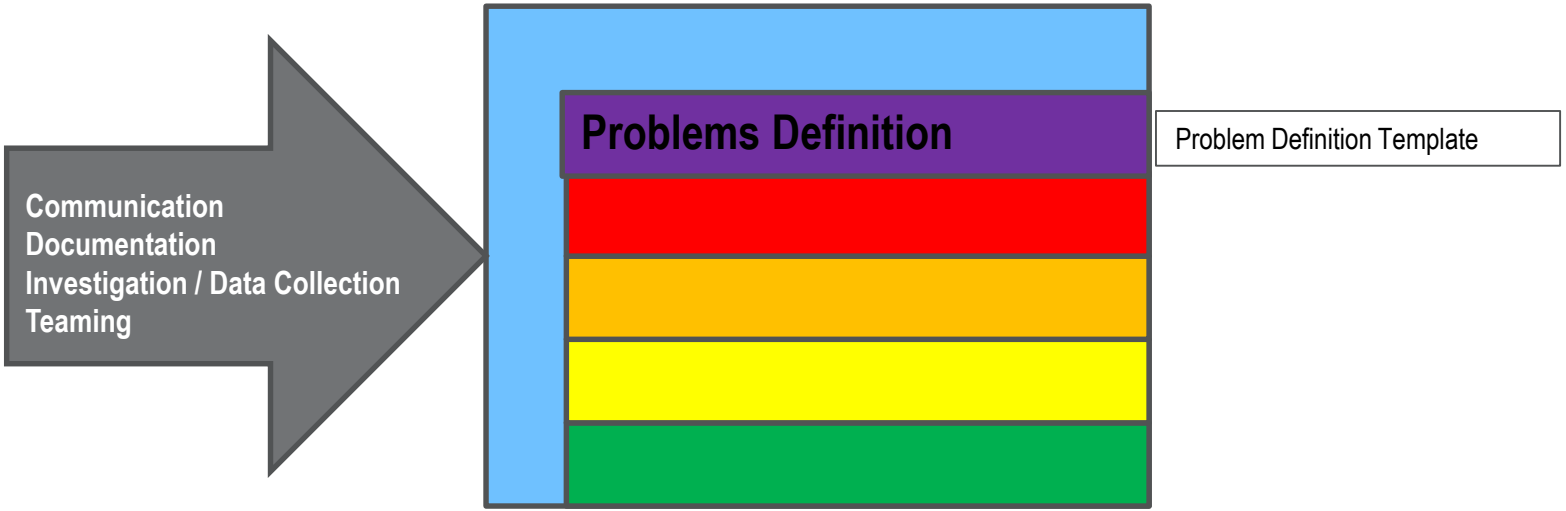
Action #	Description	Assignee	Status ECD/ACD	Objective Evidence Artefact

Containment Summary

In containment you need to:

- **determine the magnitude of a detected nonconformity or other undesirable situation**
- **prevent Growth of the problem**
- **minimize the impact on people, hardware, work in process, products and assets**
- **consider possible security risks**

Problem Definition



Problem Definition Template

Templates keep the process structured, and help gather information:

- **What was the problem?**
- **Where did it occur?**
- **When did it occur and when was it detected?**
- **How often has this problem occurred?**
- **Who is affected?**
- **What is the scope of the problem?**
- **And finally, why is it important?**

Problem Definition Template

Problem Title:

Sponsor:	Team Lead;
Customer(s)	

Define the problem

What is the problem?

Current Situation GAP Expected Results 	**Expected Results (Desired):** **Current Situation:** **Gap:** **Tracking Criteria:**

When did it occur? **Where** did it occur? **When** was it detected?

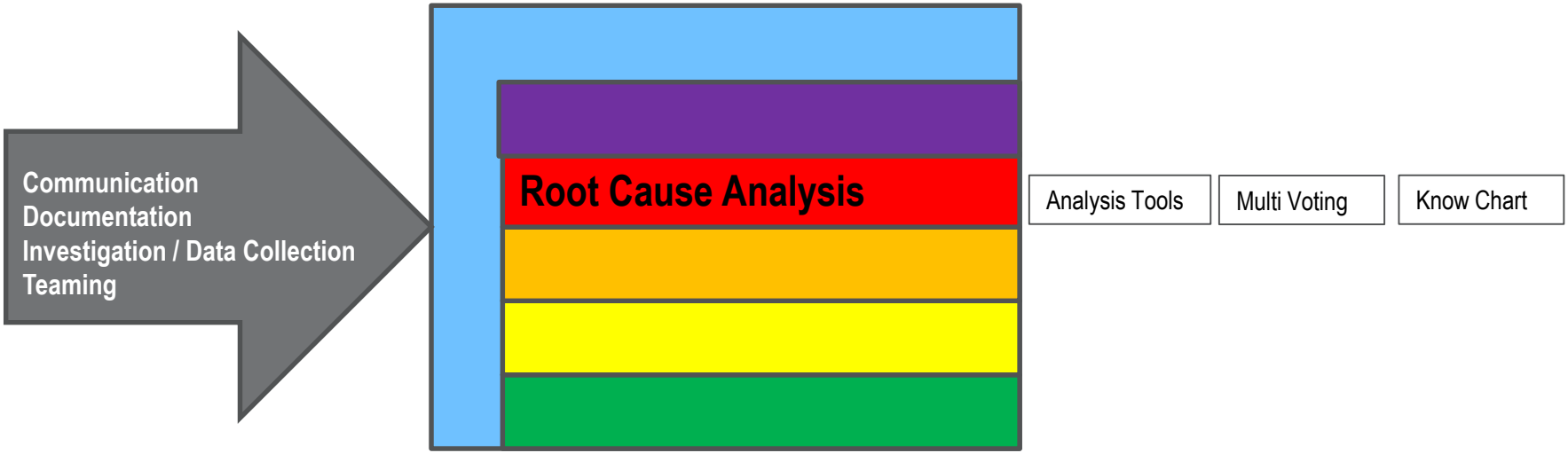
Who is affected? **How** often has the problem occurred?

Scope/Boundary:

Problem Definition Template, cont.

Importance				
Category	**High**	**Medium**	**Low**	**Rationale**
Safety				
Production				
Quality/Service				
Customer				
Other				
Overall				
Problem/Opportunity Statement				

Root Cause Analysis



Root Cause Analysis – What We Know

- What do we need to do to find out what cause the problem?
- How will we validate our fact finding?
- What is an actionable root cause?

Root Cause Corrective Action (RCCA)

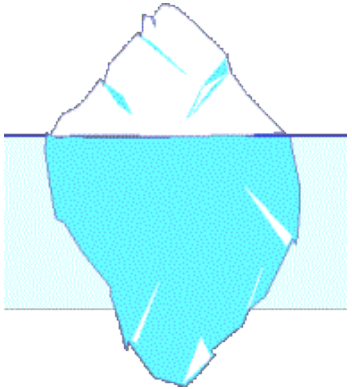
How do you begin the RCCA process?

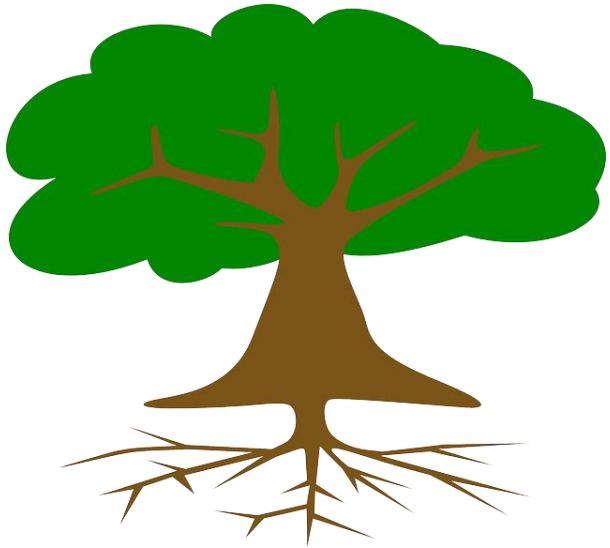
The cross functional team selects an RCA methodology/tool for root cause analysis (eg. 5-Why, Fishbone Diagram, ACEA, Process Mapping, etc.).

Root Cause Corrective Action (RCCA)

Root Cause Statement: The initiating event, action, or condition in a chain of causes that lead to a detected or potential non-conformance; root causes have no practical preceding related events, actions or condition

- The root cause statement **SHOULD BE** a brief statement of fact that addresses basic systemic issues without any obvious 'why' questions embedded in it.
- The root cause statement **SHOULD NOT** restate the finding or the problem statement.
- Note: There may be more than one root cause.





Brain storming

- Brain storming is a group creativity technique designed to generate a large number of ideas for the solution of a problem
- Advantages: quick and simple; generates a lot of ideas
- **Ground Rules** - Focus on quantity,; withhold criticism; welcome unusual ideas; combine and improve ideas

Process:

- Define the Problem statement and make it visible for everyone
- Choose a style to begin ;
- Quiet time
- Round Robin
- Popcorn
- Capture ideas on easel chart, white board or sticky notes
- Display all ideas
- **ALL** ideas are acceptable- this is a non-judgmental technique

Cause and Effect Diagram

The Cause and Effect Diagram, also called the Fishbone or Ishikawa Diagram, is a team-based brainstorming process

- Utilizes a schematic sketch, usually shaped like a fishbone
- Graphically organizes the main causes and sub-causes leading to an effect
- Does not define relationships between causes
- Reviews each element of a process – 6 M's:

  Manpower

  Material

  Methods

  Measurement

  Machine

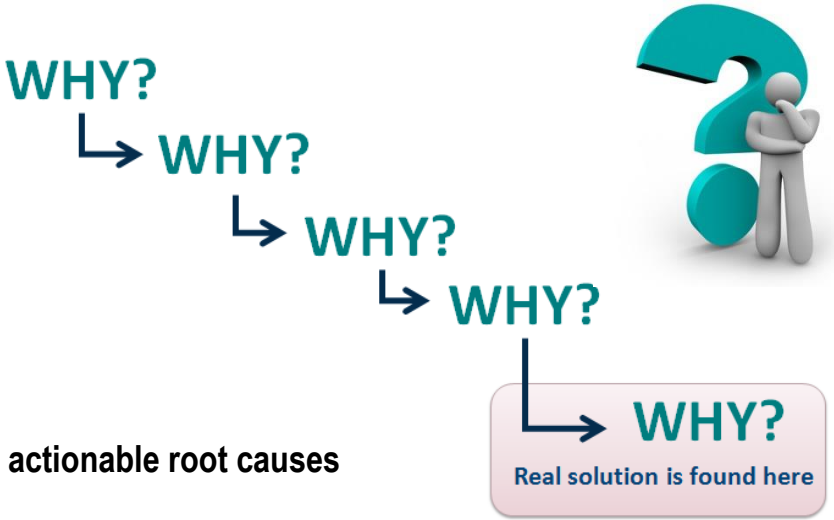
  Milieu (Environment)

5-Whys Analysis

5-Whys Analysis is a team-based brainstorming process designed to progressively probe the lower-tier causes of each potential cause

Using the tool is relatively simple

- **You first identify the problem statement**
- **Then ask 'Why' the problem occurred**
- **Continue asking 'Why' until the answers are identified as actionable root causes**



Validating Root Cause

- How much is known and how much is speculation?
- How do we gain confidence that what we are showing reflects reality?
- Have all potential causes been identified?

- **The Knot Chart – Tool**
- The Knot Chart categorizes data by the soundness of the information
- Know: Credible data
- Need to know: data that is required, but not yet fully available
- Opinion: may be credible
- Think we know: need an action to verify

- This process gathers data and questions the corrective action process, challenging you to organize the next steps of the investigation to evaluate idea and data to validate root causes.
- The processes establishes the actions and assignee to turn need to know, opinion and think we know into knows where possible.

Plan Development

Root Cause and Plan Development Objectives

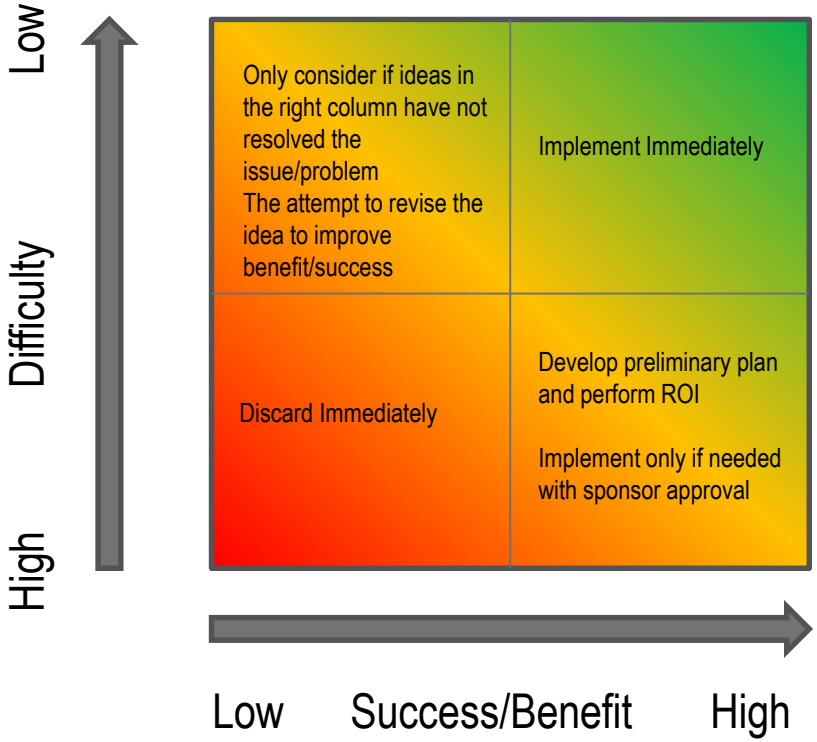
- Identify actionable root causes
- Take action to ensure the solution are developed only on known conditions
- Propose solutions for the prioritized root causes
- Develop a final proposed solution set
- Develop Measures of Effectiveness
- Measure effectiveness to verify elimination of the problem, or the likelihood of the problem recurring

RCCA Plan

Establishes an implementation plan with dates and assigns responsibility for the completion of actions to eliminate the root cause, root cause corrective action, involve long term prevention and process improvement rather than immediate fixes.

- Each RCCA Plan action should include information on WHO is responsible and WHEN the action is estimated to be completed
- Each RCCA Plan action should also include supporting objective evidence
- BEST PRACTICE: For each objective evidence item, document : **a) WHAT** is objective evidence, **b) WHO** will verify objective evidence ,and; c) **When** will it be verified
- **RCCA Plan Implementation Da**te: The date when all tasks in the RCCA Plan will be implemented
- **Verification of implementation Date**: the date the RCCA Plan is verified by the supplier as implemented

Solution Prioritization – Solution Selection Square



S#	Solution Description
1	
2	
3	
4	
5	

Plan Development

Methodology

- Incorporate the identified solutions into a Corrective Action Plan (CAP) that eliminates or mitigates the root cause

How do you do it?

1. Identify potential solutions aligned with the results of the root cause analysis
2. Evaluate the selected solutions to ensure they have mitigated or eliminated the defined problem
3. Coordinate proposed solutions and obtain concurrence of the sponsors and stakeholders
4. Develop and finalize the CAP including Measures of Effectiveness (MoE)

Measure of Effectiveness

- **Measures of Effectiveness (MoE) establish the criteria and methods used to objectively measure the results achieved from RCCA**
- Every corrective action plan is required to have at least one MoE
- Measures of Effectiveness are defined in the corrective action plan and are used during the verification of effectiveness and are used as a measure of the effectiveness of the RCCA process.
- Examples are, but not limited to - improved first time yields, no recurrence of problem over time, improved process capability, improved customer satisfaction scoring

Plan Implementation

What is it?

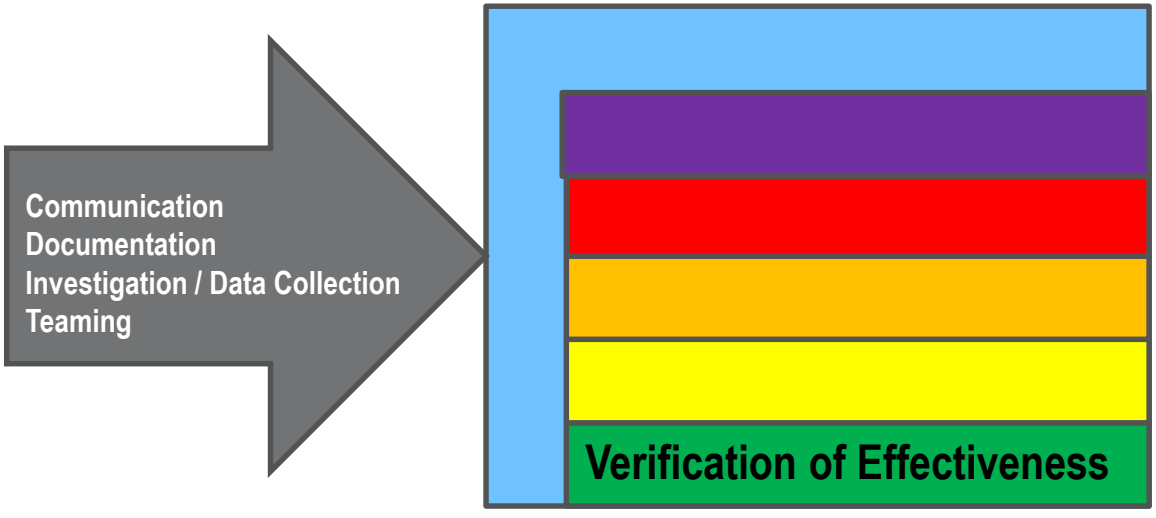
- **Execution of the Corrective Action Plan in order to mitigate/eliminate the root cause of a detected nonconformity or other undesirable situation**

How do you do it?

- **Initiate and track Corrective Action Plan tasks to completion**
- **Elevate unresolved issues impacting implementation**
- **Verify completion of all planned tasks and document completion date(s)**

- **NOTE: Completion of the Corrective Action Plan is NOT the verification of Corrective Action Effectiveness**

Verification of Effectiveness Plan



Verification of Effectiveness Record

RCCA Out Template

Verification of Effectiveness Plan

Measures of Effectiveness (MoE) that confirm that the root cause corrective action plan continues to be effective after it has been fully implemented in preventing recurrent of the detected non conformance

Each MoE should document:

- **WHAT** the MoE is that will be performed to verify Corrective Action is effective in preventing recurrence of detected non-conformance
- **WHO** is responsible for the MoE
- **WHERE** the MoE will be performed
- **WHEN t**he MoE will be completed
- **HOW** the MoE will be measured to determine whether root cause corrective action plan is considered effective
- **Verification of Effectiveness Date**: the date the RCCA Plan will be verified effective by the supplier; this date SHOULD NOT BE the same as or precede the RCCA Verification of Implementation Date

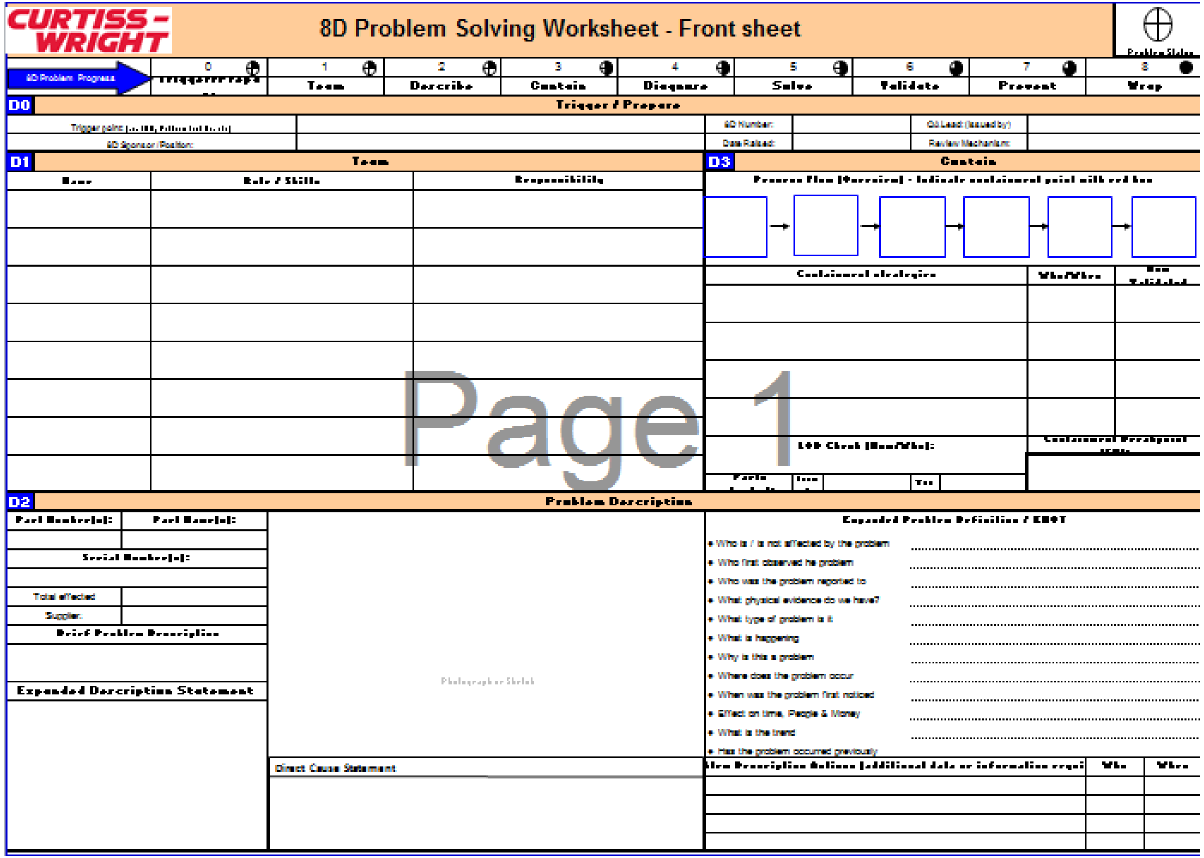
- MoE closes the loop on the RCCA PROCESS and it is not optional

Supplier Management Handbook

Additional guidance can be obtained from the Supplier Management Handbook:

https://www.sae.org/servlets/registration?PORTAL_CODE=IAQG&OBJECT_PKG=iaqg.businessClasses&OBJECT_TYPE=SCMHGeneral&PAGE=getSCMHBOOK

Appendix A – Supplier 8D SCAR templates



8D Problem Solving Worksheet - Front sheet

8D Problem Progress: 0 Trigger/Prepare | 1 Team | 2 Describe | 3 Contain | 4 Diagnose | 5 Solve | 6 Validate | 7 Prevent | 8 Wrap

D0 Trigger / Prepare

Trigger point		8D Number:		QA Lead (issued by):	
8D Sponsor/Position:		Date Raised:		Review Mechanism:	

D1 Team

Name	Role / Skills	Responsibility

D3 Contain

Process Flow (Overview) - Indicate containment point with red box

Containment strategies	Who/When	How Validated

LOD Check (Name/Who):

Containment Breakpoint (If any)

Page 1

D2 Problem Description

Part Number(s):	Part Name(s):
Serial Number(s):	
Total affected	
Supplier:	
Brief Problem Description	
Expanded Description Statement	

Photograph or Sketch

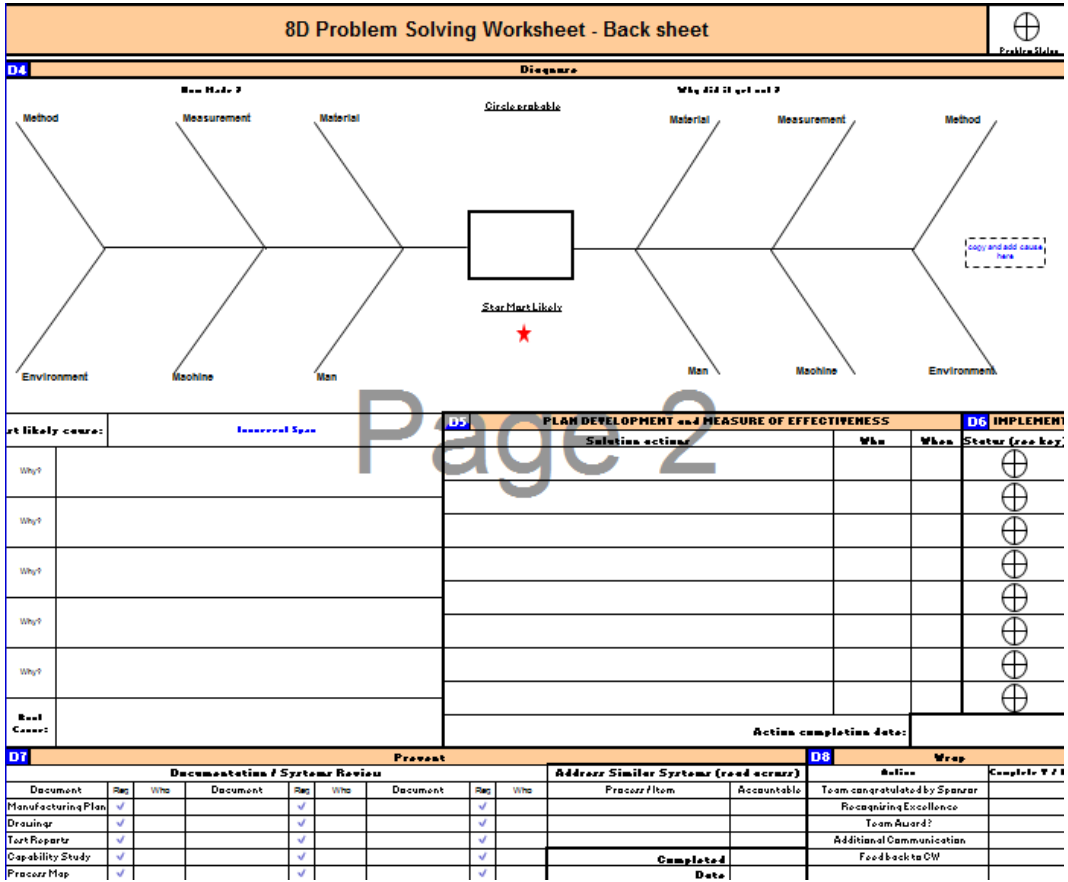
Direct Cause Statement

Expanded Problem Definition / IS-IS NOT

- Who is / is not affected by the problem
- Who first observed he problem
- Who was the problem reported to
- What physical evidence do we have?
- What type of problem is it
- What is happening
- Why is this a problem
- Where does the problem occur
- When was the problem first noticed
- Effect on time, People & Money
- What is the trend
- Has the problem occurred previously

Problem Description Actions (additional data or information required)	Who	When

Appendix A – Supplier 8D SCAR template (cont'd)



8D Problem Solving Worksheet - Back sheet

D4 Diagram

How Made ?

Why did it get out ?

Circle probable

Method | Measurement | Material | Material | Measurement | Method

copy and add causes here

Start Most Likely

Environment | Machine | Man | Man | Machine | Environment

Page 2

t likely cause: | Incorrect Spec

Why? | Why? | Why? | Why? | Why? | Root Cause:

D5 PLAN DEVELOPMENT and MEASURE OF EFFECTIVENESS

Solution actions	Who	When	Status (see key)

Actions completion date:

D6 IMPLEMENT

D7 Prevent

Documentation / Systems Review

Document	Req	Who	Document	Req	Who	Document	Req	Who
Manufacturing Plan	✓			✓			✓	
Drawings	✓			✓			✓	
Test Reports	✓			✓			✓	
Capability Study	✓			✓			✓	
Process Map	✓			✓			✓	

Address Similar Systems (need across)

Process / Item	Accountable
Completed Date	

D8 Wrap

Action	Complete Y / N
Team congratulated by Sponsor	
Recognizing Excellence	
Team Award?	
Additional Communication	
Feedback to CW	

Concise 8D Word template

CURTISS-WRIGHT

8D Report

Title	Date Opened	Last Updated
CW QN #: CW SP ID:	Customer Name	Customer SCAR#
Part Number		

Status							
D1	D2	D3	D4	D5	D6	D7	D8

D1: Team

Name	Role/Skills

D2: Problem Description

D3: Containment

D4: Root Cause

D5: Corrective Action(s)

D6: Implement & Verify Corrective Action(s)

D7: Prevent Recurrence

D8: Publicize Findings and Congratulate Team