

PHILLIPS SERVICE INDUSTRIES

**ROOT CAUSE
&
CORRECTIVE ACTION
(RCCA)**

Root Cause Analysis and Corrective Action is a Process For:

- 📄 Finding the *true cause(s)* of events
- 📄 *Identifying and Implementing* corrective actions
- 📄 Assessing the *effectiveness* of corrective actions
- 📄 *Preventing* recurrence of the events



Why Root Cause Analysis ?

- Integral Part of Total Quality
- Our Customers Expect It
- Makes Good Business Sense
- AS9100 Requirement
- Keeps us from passing on problems to our internal and external customers
- When properly executed, it replaces the past practice of “Band-Aid” fixes



A Cause ...

Is a set of circumstances or conditions that :

- Allows a condition to exist or an event to happen, or
- Makes a condition exist or an event happen.



The Critical Five

Direct Cause: The cause that directly resulted in the event.
(The first cause in the chain.)

Contributing Cause: The cause(s) that contributed to an event but, by itself, would not have caused the event. (The causes after the direct cause.)

Root Cause: The fundamental reason for an event, which if corrected, would prevent recurrence. (The last cause in the chain.)

Specific Corrective Action: Action(s) taken to correct or improve conditions noted in the event, by changing the direct cause or the direct cause and the effect.

Preventive Corrective Action: Action(s) taken that prevent recurrence of the condition noted in the event. (Preventive actions must directly address the root and contributing causes to be effective.)



The process requires complete honesty and no predetermined assumptions.

Follow the Data!!! Don't try to lead it.

Cop-out, “Operator error”. Why do people not comply?

- Improper instructions
- Improper tools
- Improper training



Don't Limit the Search!

What role did management systems play?

Are you looking beyond your own back yard?

Be attentive to causes that show up frequently!



Why – Why – Why – Why – Why (Determining Cause)

Most problems, even the most serious or complex, can be handled by using asking Why – Why – Why – Why – Why.

**So, why use the
“Why – Why – Why – Why – Why” process?**

Just Keep Asking

Why did it happen?

PROBLEM: Didn't get to work on time. —————→ Why?

(DIRECT) CAUSE: Car wouldn't start —————→ Why?

(CONTRIBUTING) CAUSE: Battery was dead. —————→ Why?

(CONTRIBUTING) CAUSE: Dome light on all night. —————→ Why?

WHY? - ROOT CAUSE: Kids played in car, Left door ajar.



Causes

Direct Cause: The cause that directly resulted in an event. (The first cause in the chain.)

This is the answer to your first question (your problem statement).

Contributing Cause: The cause that contributed to an event but, by itself, would not have caused the event (The causes after the direct cause).

Note: For a simple problem there may not be any contributing causes.

Root Cause: The fundamental reason for an event, which if corrected, would prevent recurrence (The last cause in the chain).

Let's Expand on a Problem

Cause & Effect

Received ticket for safety violation.

↳ Car exhaust too loud.

↳ Muffler knocked loose from tail pipe.

↳ Daughter hit pot hole.

↳ Pot holes in road.

↳ Winters damaged roads.

↳ Congress won't approve extra money for better roads.

↳ Congress doesn't have extra money.

↳ Congress spent money on pork barrels.

↳ Too many lawyers in Congress.

Solution? Drive car in Sweden where there are fewer lawyers.



CORRECTIVE ACTION:

A set of planned activities (actions) implemented for the sole purpose of *permanently* resolving the problem.






Three Types of Corrective Action

- **Specific**
- **Preventive**
- **Systemic**

These types of corrective action are quite different in how they are applied and what they do. Not understanding this leads to serious mistakes in fixing problems.

SPECIFIC CORRECTIVE ACTION

Action(s) taken to correct the direct cause. (Corrects or improves the condition noted in the event, by changing the direct cause, or the direct cause and the effect.)

-  Also encompasses Containment
-  Used to correct the Direct Cause
-  Does not prevent recurrence!



PREVENTIVE CORRECTIVE ACTION

Action(s) taken that prevent recurrence of the condition noted in the event (Preventive actions must directly address the root and contributing causes to insure effectiveness.)

- Preventive corrective actions focus on changing the root cause and any contributing cause(s).
- You probably won't get a 100% effective fix at just one point (the root cause).
- You often have to consider two or more contributing causes to ensure the chain is broken



Systemic Corrective Action

Action(s) taken that address the failure in the supplier's quality system that allowed the event to occur.

- Usually is on a larger scale
- Probably can have an effect on other part numbers
- May have an effect on **other customers**.



Specific Action Test

Test the specific solutions to ensure they are valid:

- 📄 Do the corrective actions eliminate or control the direct cause ?
- 📄 Are the results desirable?
- 📄 Will the action immediately contain the problem and immediately prevent it from recurring?

Preventive Action Test

Test the proposed preventive actions by asking:

-  If these preventive corrective actions were in place, would the event have occurred?
-  Do the preventive corrective actions lower the risk factor of the event to an acceptable level?



Implementation Timeline

Specific Action / Containment

Must prevent the problem from occurring again, but must do so immediately.
This may require shipment to shipment monitoring!

Preventive Action

Must be timed reasonably so as to not affect the ability to monitor on an ongoing basis. Consider the ability to do so and strain on resources.

Systemic

May be a longer term fix, but allowing this to go too far may enable recurrence if Preventive is not robust.

Example: REWRITING JOB DESCRIPTION TO TRAIN NEW EMPLOYEES
AND DEVELOP PROCEDURES TO DO SO!



Follow - Up

A review must be conducted in sufficient detail to assess whether the corrective actions that have been implemented are effective as implemented and are truly preventing recurrence of the event.






EFFECTIVENESS MEASUREMENTS

The criteria used to evaluate if the corrective actions achieved the desired outcome.

Did Corrective Actions Work?

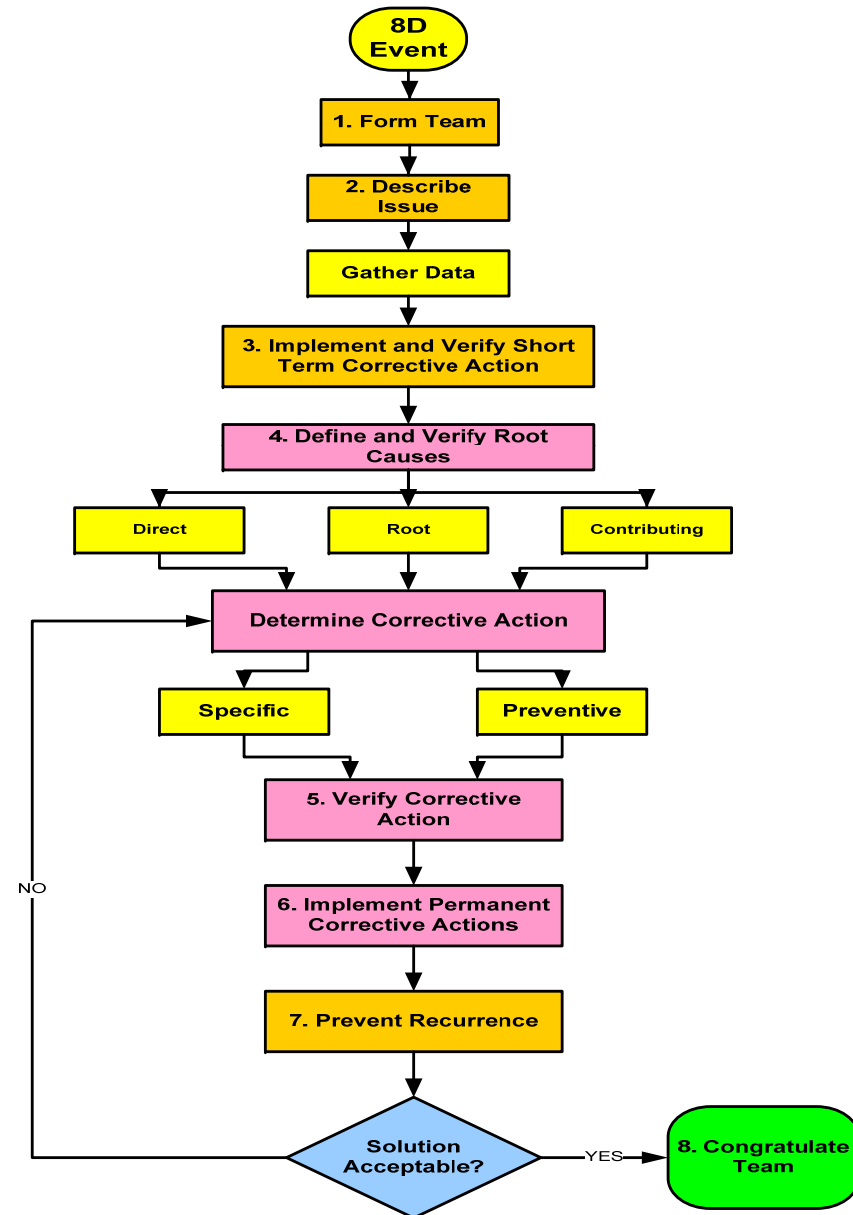
Some additional things to consider:

-  If corrective action implemented differs from proposed, find out why. **THE CHANGE MAY BE VALID!**
-  If better or alternate corrective actions were implemented, document the changes.
-  Periodic checks may be necessary to be sure the corrective actions are still in place and continue to be effective.

8D / RCCA Flow Chart

Root Cause Analysis and Corrective Action

ACT ON FACT !
The process won't
work without it !





CASE STUDY

EXAMPLE AN ACTUAL CAR



THE CAR

FINDING: .380 Maximum center diameter checks .393
0.13 Oversize

CASE STUDY RESPONSE:

DIRECT CAUSE: Operator error




REMEMBER...

**Root Cause Analysis and Corrective
Action is a Process For:**

 Finding the *true cause(s)* of events

LET'S LOOK AT THE DIRECT CAUSE AGAIN.....



FINDING: .380 Maximum center diameter checks .393
.013 Oversize

CASE STUDY ACTUAL RESPONSES...*CAUSE*:

DIRECT CAUSE: .380 maximum center diameter checks
.393 due to operator error

<<REVIEWER COMMENT: THIS IS SIMPLY
RESTATING THE FINDING. DID YOU PERHAPS
OVERLOOK REVIEW OF THE PROCEDURES,
PROCESSING, EQUIPMENT, TRAINING INVOLVED IN
THIS PROCESS???



RESPONSES...*CAUSE*:

CONTRIBUTING CAUSE: NOT APPLICABLE

ROOT CAUSE: NOT APPLICABLE



REMEMBER...

Root Cause Analysis and Corrective Action is a Process For:

 Finding the *true cause(s)* of events

**CASE STUDY
RESPONSES:**

CONTRIBUTING CAUSE: N.A.

ROOT CAUSE: N.A.

CONTRIBUTING CAUSE: N.A. << REVIEWER COMMENT: ARE YOU SURE? ASK YOURSELF: WHY DID THE CONTRIBUTING CAUSE HAPPEN. CENTER DRILL CUT OVERSIZE (WHY?). MACHINE DID NOT HOLD TOLERANCE (WHY?). OPERATOR DID NOT CATCH THIS WHEN INSPECTING PART (WHY?)

ROOT CAUSE: N.A. << REVIEWER COMMENT: WHAT FAILED IN THE OVERALL QUALITY MANAGEMENT SYSTEM THAT CAUSED THE OVERALL FAILURE THAT MIGHT RESULT IN A FUTURE FAILURE OF THE SAME TYPE???

NOT ADDRESSING ROOT CAUSE IS UNACCEPTABLE



CASE STUDY RESPONSES...*CORRECTIVE ACTIONS:*

SPECIFIC ACTION/CONTAINMENT: OPERATOR NOT ALLOWED TO RUN THIS OPERATION ANYMORE

PREVENTIVE ACTION: NOT APPLICABLE



REMEMBER...

**Root Cause Analysis and Corrective
Action is a Process For:**

 Identifying and Implementing corrective actions

LET'S LOOK AGAIN AT THE PROPOSED ACTION:



CASE STUDY RESPONSES...*CORRECTIVE ACTIONS*:

SPECIFIC ACTION/CONTAINMENT: OPERATOR NOT ALLOWED TO RUN THIS OPERATION ANYMORE

<<REVIEWER COMMENT: HOW WILL PREVENTING THE OPERATOR FROM RUNNING THIS JOB AGAIN PREVENT POTENTIAL ISSUES IN THE FUTURE??? HOW DO YOU KNOW IT IS NOT PROCESS OR EQUIPMENT RELATED, INSTEAD OF AN OPERATOR ISSUE???

PREVENTIVE ACTION: N.A.

<< REVIEWER COMMENT: HOW WILL YOU PREVENT THIS FROM HAPPENING AGAIN??? N/A IS UNACCEPTABLE....YOU MUST ADDRESS HOW YOU WILL PREVENT THIS FROM HAPPENING AGAIN. WHAT WILL YOU REVIEW AND PUT IN PLACE TO ENSURE THIS???

Corrected Causes

AFTER UTILIZING THE 8D PROCESS

Finding

.380 Maximum center diameter checks .393 - .013 Oversize

Direct Cause

Manual lathe not capable of holding tolerance due to wear and/or poor maintenance of machine

Contributing Cause(s)

Tooling used, operator training, not monitoring on-going parts, processing, tap relief, previous center lap operation, operator workmanship, material, lack of knowledge in regards to machine capabilities, poor machine maintenance.

Root Cause

Process engineering processed job to run manually in equipment they had no information on in regards to capability, equipment not presently capable of holding tolerance.



***Corrected* ACTIONS**

AFTER UTILIZING THE 8D PROCESS

Specific Action / Containment

Train operator in use of chamfer gage, run other product for this operation elsewhere until the machine capability can be addressed, review all like product in system, determine if Customer is in receipt of any suspect product, recall product if necessary.

Preventive Action

Processing reviewed by Supervisor, Engineering and Quality Assurance. Determination made based on review of all inputs, machine, inspection technique, processing, material, tooling that moving this operation to the NC machining center at this time from the manual lathe

Systemic Action

Process Change Request generated by Engineering to move operation 90 to NC machine in accordance with established PCR procedure and related forms. Equipment needs review (process to determine present capability and what its use will be in the future. Operators and process engineers need to be made aware of capability information for future reference.



Definitions

CAR: Corrective Action Request

Contributing Cause(s): The cause(s) that contributed to an event but, by itself, would not have caused the event. (line causes after the direct cause.)

Corrective Action: A set of planned activities (actions) implemented for the sole purpose of permanently resolving a problem.

Data Analysis: Examination of the information collected before, during, and after the event to identify the causal factors, impact of the event, and the causes (root, direct, and contributing).

Direct Cause: The cause that directly resulted in the event. (line first cause in the chain.)

Effectiveness Measurements: The criteria used to evaluate if the corrective actions have achieved the desired outcome.

Event: All inclusive term for any of the following: finding, occurrence, deficiency, or incident.

Follow Up: A review to determine if the corrective actions have been effective.

Natural Team: A group of people having vested ownership of the problem to be solved.

Definitions

Plant-wide Corrective Action: The activities involved in performing corrective actions that expand beyond the boundaries of the natural team (area, department, jurisdiction, or facilities).

Preventive Corrective Action: Action (s) taken that prevent recurrence of the condition noted in the event. (Preventive actions must directly address the root and contributing causes to be effective.)

Qualified Team: The natural team, including other individuals, who can provide necessary resources to understand the problem, or can help in the root cause analysis and corrective action process.

Root Cause: The fundamental reason for an event, which if corrected, would prevent recurrence. (The last cause in the chain.)

Root Cause Analysis and Corrective Action Process: An effective tool for finding the true or actual cause of events, facilitating effective corrective action and preventing their recurrence.

Specific Corrective Action: Action (s) taken to correct or improve the condition noted in the event by changing the direct cause or the direct cause and the effect.