

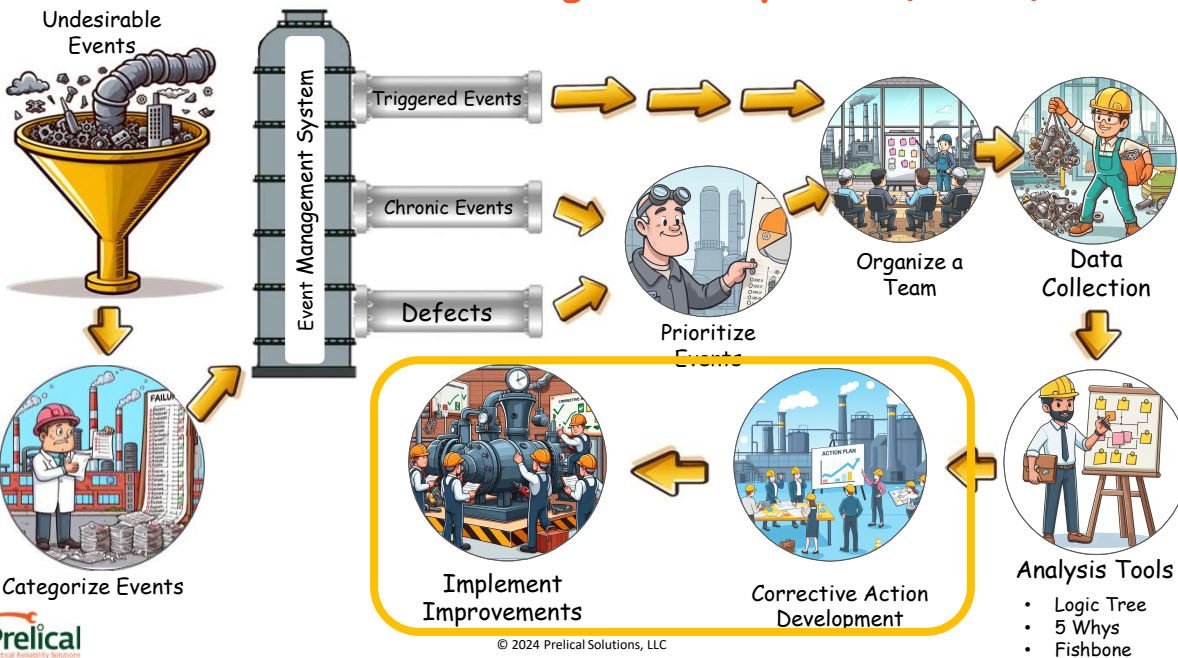
# Corrective Action Development & Implementing Improvements



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## Prelical Event Management System (PEMS)



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# Agenda

- **Writing Corrective Actions**
- **Assessing and Prioritizing Corrective Actions**
- **Reporting & Presenting Findings**
- **Assessing RCA Quality**
- **Executing Corrective Actions**



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# Corrective Action Listing from the RCA

Identified Root Cause	P, H, or L*	Suggested Corrective Actions	Resp	Due Date	Completion Date
		<div style="background-color: #f4a460; border-radius: 25px; padding: 40px; display: inline-block;">                     Let's discuss how to properly fill this out                 </div>			

\*P,H, or L = Physical, Human, or Latent Root



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# Writing Corrective Actions



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## Writing Corrective Actions (CA)

### Address the System....not the people

- ★ Go beyond addressing just the Physical Roots
- ★ Target the weaknesses in the organizational system
- ★ **Do not make recommendations for Human Roots**

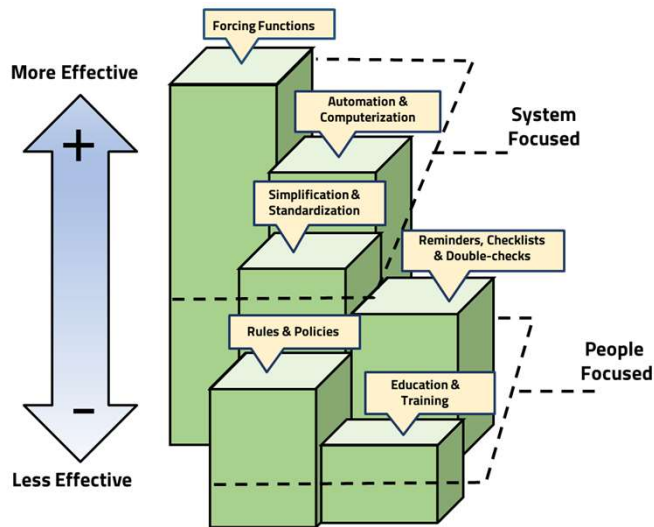
### Change the System....make it easier for people to consistently perform correctly

*(make it easy to do it right, and difficult to do it wrong!)*

- Automate to reduce the human decisions
- Standardize to promote consistent decisions
- Simplify to remove confusion when deciding

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# Hierarchy of Intervention Effectiveness



Source: <https://patientsafe.wordpress.com/the-hierarchy-of-intervention-effectiveness/>



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# Assessing & Prioritizing Corrective Actions



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## Assessing Corrective Actions – The Rigor Test

The More Criteria That Are Met, the Stronger the Action Plan Becomes

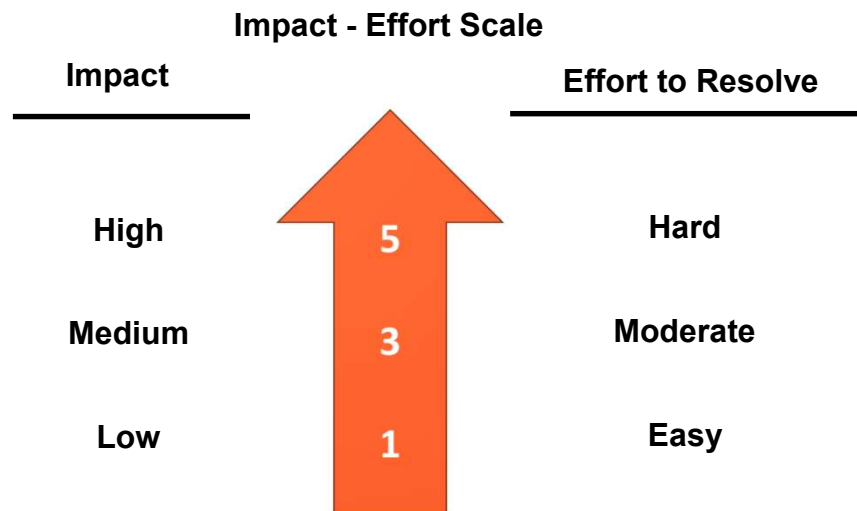
✓	Rigor Test Questions
	The CA directly mitigates or eliminates the identified root cause
	The CA is <b>SMART</b> (Specific, Measurable, Attainable, Realistic, Timely)
	The CA will survive changes in personnel (institutionalization)
	A cost/benefit analysis has been determined to justify the ROI of the CA (business case)
	Checks-and-balance systems are in place to ensure sustainability of the CA
	Removing this root cause from the combination of the others in the RCA, by itself, will prevent recurrence for now

Rating	Indicator
>/ = 4	Strong
</ = 2	Weak



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## Prioritizing Corrective Actions



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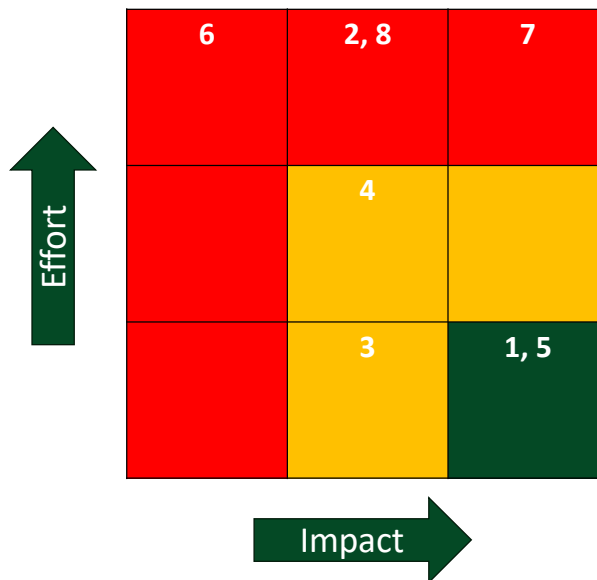
## Prioritizing Corrective Actions

Proposed Corrective Actions	Impact	Effort
Implement Training for Millwrights	5	1
Develop New Incentive Program for Corporate Purchasing Group	3	5
Develop Electronic Inspection Forms for Operator Rounds	3	1
Define Balance Standards	3	3
Add New Assets to Condition Monitoring Schedules	5	1
Add New Equipment to CMMS	1	5
Perform Precision Alignment on Like Equipment During Next Outage	5	5
Perform Scheduled PMs on Overtime if Emergencies Prevent During Shift	3	5



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## Prioritizing Corrective Actions Example



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## Reporting and Presenting RCA Findings



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## Be Proactive...Prepare for Your Final Presentation

- Where will your audience be sitting?
- How many sets of handout materials will you need (i.e. – verification log)?
- What audio/visual technologies will be available to you (i.e. – is internet available and with a strong signal)?
- Is your laptop compatible with the LCD projector/TV provided (e.g. –HDMI cables)?
- Will your laptop project satisfactorily with their LCD projector/TV (if applicable)?
- Can you set up in the room 30 minutes earlier, to test equipment/prepare materials?
- Where are the electrical outlets and are outlet bars available?
- Will you need an extension cord?
- Will everyone be able to see the screen?
- Do you want certain people to sit in certain seats for political purposes?
- Be proactive, Be prepared!!

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## Be Thick-Skinned!

**“Be prepared for attacks on the credibility of your verifications, as well as your financials (i.e. – ROIs)”**



## Presentation Agenda Example

**Demo Company  
Specific RCA  
Download Page**

### Agenda

- Introduction & Summary of Root System Used
- Event Background
- RCA Team and Methodology
- Findings
- Corrective Actions
- Implementation/Execution Plan
- Conclusion
- Acknowledgments
- **Commitment to Next Steps**

**Recurring Failure of P-100**

# Assessing RCA Quality



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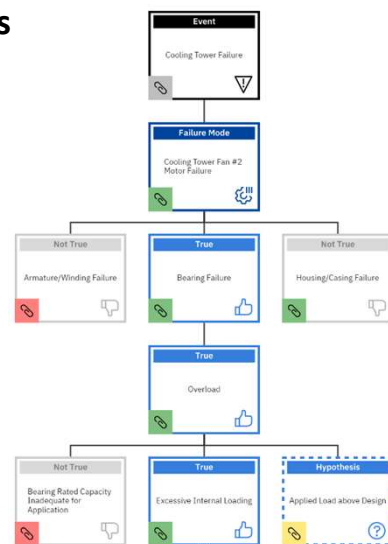
## EasyRCA Visual Synopsis

**PAPER CLIPS**

- = File Link/Comment Attached (No Task Assigned)
- = Task Assigned, Completed by Due Date
- = Task Assigned, Past Due
- = Task Assigned, Not Due Yet

**Why doesn't the EVENT define/quantify the impact on the business?**




**Why are there RED paper clips on a completed analysis?**

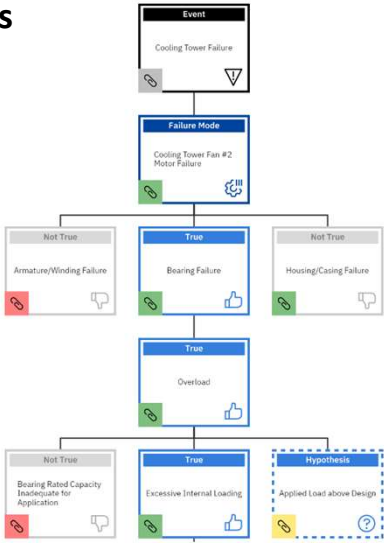


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### EasyRCA Visual Synopsis


**BLOCK/NODES**

-  = Hypotheses proven to be TRUE (w/evidence)
-  = Hypotheses proven to be NOT TRUE (w/evidence)
-  = Hypotheses not yet proven either way (dotted line) but assigned a task that is still due



The diagram shows a fault tree for 'Cooling Tower Failure'. The top event is 'Cooling Tower Failure'. Below it is 'Failure Mode: Cooling Tower Fan #2 Motor Failure'. This branches into three nodes: 'Armature/Winding Failure' (Not True), 'Bearing Failure' (True), and 'Housing/Casing Failure' (Not True). 'Bearing Failure' further branches into 'Overload' (True) and 'Applied Load above Design' (Hypothesis). 'Overload' branches into 'Bearing Rated Capacity Inadequate for Application' (Not True) and 'Excessive Internal Loading' (True). 'Applied Load above Design' is a hypothesis node with a dotted border.

**Why are there blocks with dotted-line perimeters (indicating no conclusion as to TRUE or NOT TRUE status)?**



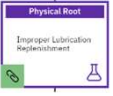

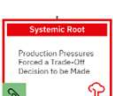

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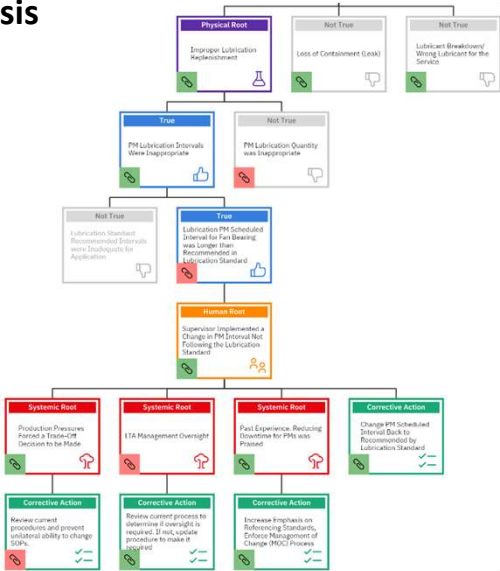
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### EasyRCA Visual Synopsis


**ROOTS/CORRECTIVE ACTIONS**

-  = Physical Root Cause (Purple)
-  = Human Root Cause (Improper Decision – Orange)
-  = Latent/Systemic Root Cause (Red)
-  = Corrective Actions (Green)



The diagram shows a fault tree for 'Improper Lubrication Replenishment'. The top event is 'Improper Lubrication Replenishment'. It branches into 'Loss of Containment (Leak)' (Not True) and 'Lubricant Breakdown/Wrong Lubricant for the Service' (Not True). 'Improper Lubrication Replenishment' further branches into 'PM Lubrication Intervals Were Inappropriate' (True) and 'PM Lubrication Quantity was Inappropriate' (Not True). 'PM Lubrication Intervals Were Inappropriate' branches into 'Lubrication Standard Recommended Intervals were Exceeded for Application' (Not True) and 'Lubrication PM Scheduled Interval for Fan Bearing was Longer than Recommended as Lubrication Standard' (True). 'Lubrication PM Scheduled Interval for Fan Bearing was Longer than Recommended as Lubrication Standard' branches into 'Human Root: Supervisor Implemented a Change in PM Interval Not Following the Lubrication Standard' (Human Root). This Human Root branches into three Systemic Root causes: 'Production Pressures Forced a Trade-off Decision to be Made', 'ITA Management Oversight', and 'Past Experience, Reducing Lubrication PM Scheduled Intervals for PMS was Present'. Each Systemic Root is associated with a specific Corrective Action.

**Are all 'root types' identified along with associated Corrective Actions?**



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## RCA Quality Assessment Tool

### Leadership RCA Evaluation Checklist

<input type="checkbox"/> Does the analysis have an adequate data collection strategy?	Yes	No
<input type="checkbox"/> Are evidentiary documents linked to support ALL hypotheses?	Yes	No
<input type="checkbox"/> Does the analysis have a cross-section of team members?	Yes	No
<input type="checkbox"/> Were the stated Event and Modes factual?	Yes	No
<input type="checkbox"/> Are the modes factual statements of the problem's manifestation?	Yes	No
<input type="checkbox"/> Was the "How Can" questioning used to generate hypotheses down to the physical roots (PR)?	Yes	No
<input type="checkbox"/> Was the "Why" questioning used to understand why decisions were made at the human roots (HR)?	Yes	No
<input type="checkbox"/> Were SME's* used outside of the core team to validate hypotheses if needed	Yes	No
<input type="checkbox"/> Was at least one physical root (PR) identified?	Yes	No
<input type="checkbox"/> Was at least one human root (HR) identified?	Yes	No
<input type="checkbox"/> Was at least one latent or systemic root identified?	Yes	No
<input type="checkbox"/> Are sound corrective actions made for eliminating root causes?	Yes	No
<input type="checkbox"/> Are 'metrics to track' established for each corrective action?	Yes	No
<input type="checkbox"/> Is an ROI estimated for each corrective action and the analysis as a whole?	Yes	No
<input type="checkbox"/> Are corrective actions tracked for an adequate period to gauge their effectiveness on the bottom-line?	Yes	No
<input type="checkbox"/> Am I comfortable others may rely on this RCA in the database, as being comprehensive and accurate?	Yes	No
<input type="checkbox"/> Was the time spent to complete the analysis in line with the severity of the event impact?	Yes	No
<input type="checkbox"/> Were the principles of HOP* incorporated into the RCA (if applicable)?	Yes	No

\*SME = Subject Matter Expert

\*HOP = Human & Organizational Performance



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## Implementing Solutions



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## Executing Corrective Actions

