Corrective Action Development
&
Implementing Improvements

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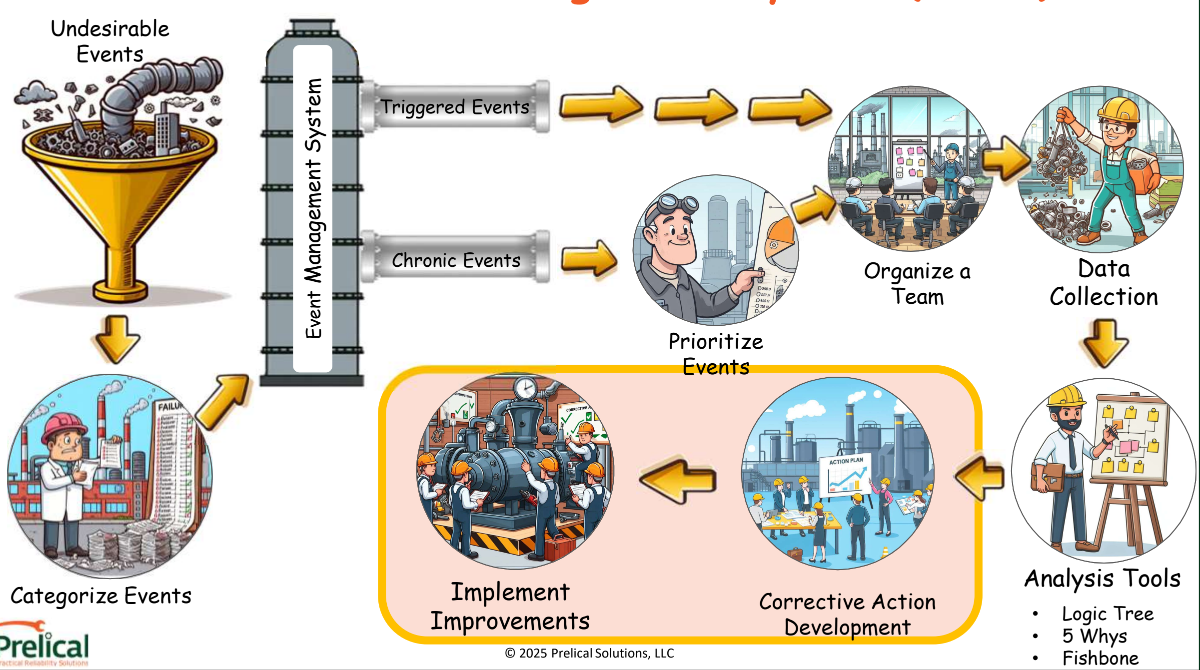
Prelical Event Management System (PEMS)



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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
		Let's discuss how to properly fill this out			

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

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Writing Corrective Actions

Writing Corrective Actions (CA)

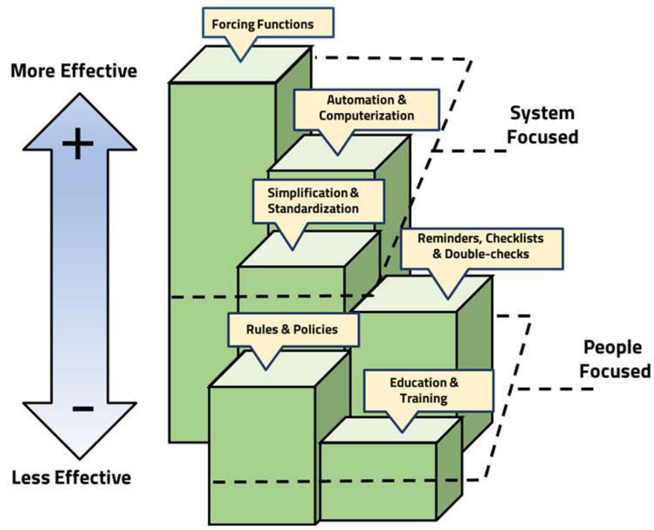
Address the System....not the people

- ★ 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

Hierarchy of Intervention Effectiveness



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

Assessing & Prioritizing Corrective Actions

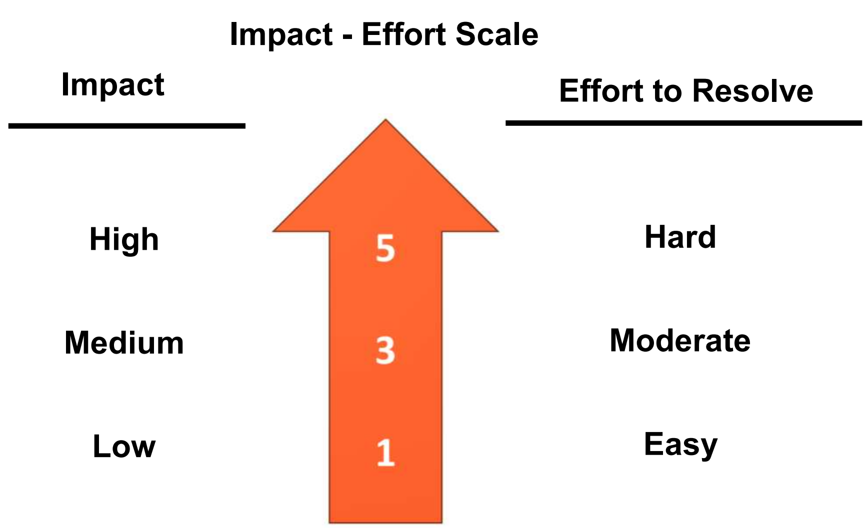
Assessing Corrective Actions – The Rigor Test

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 **SMART** (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

Prioritizing Corrective Actions



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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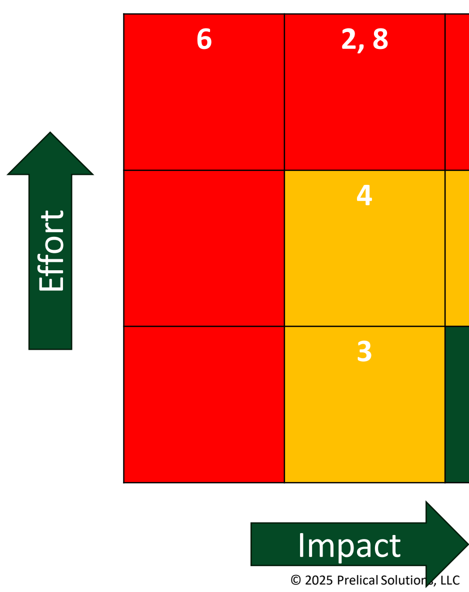
Prioritizing Corrective Actions Example



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Reporting and Presenting RCFA 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)"

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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

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Develop a presentation for management on the findings and corrective action plan

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Practical Reliability Solutions

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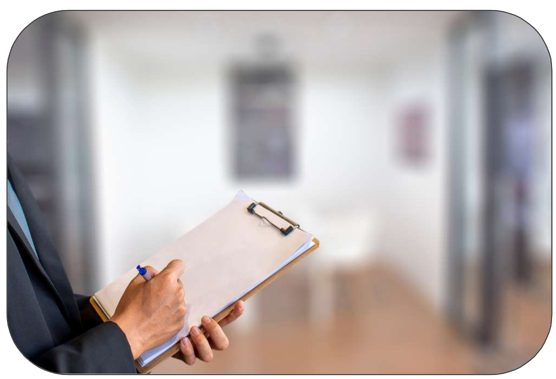
Assessing RCFA Quality



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EasyRCA Visual Synopsis

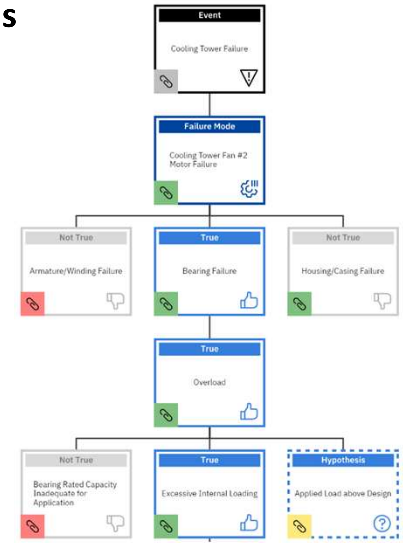
PAPER CLIPS

= 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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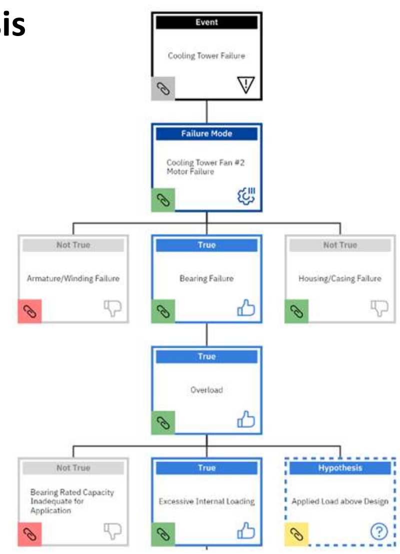
EasyRCA Visual Synopsis

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



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

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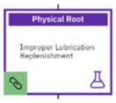
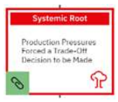
EasyRCA Visual Synopsis

ROOTS/CORRECTIVE ACTIONS



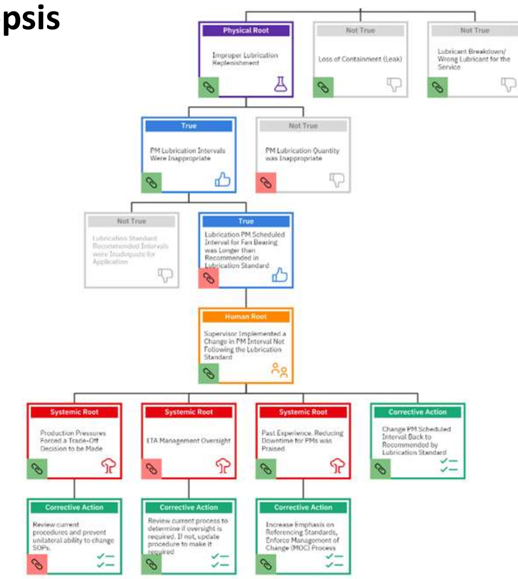
= Physical Root Cause (Purple)

= Human Root Cause (Improper Decision – Orange)



= Latent/Systemic Root Cause (Red)

= Corrective Actions (Green)



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

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RCFA Quality Assessment Tool

Leadership RCA Evaluation Checklist

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

Suggested Corrective Actions
Develop a maintenance plan for monthly PM
Create a new historian tag to monitor inlet pressure
Develop a new lubrication route for PM-1 pumps
Monitor inlet pressure, outlet pressure and calculate differential pressure and set alarm

CMMS / EAM

Process Historian

Lubrication Management

Will RCA CA's be Entered Into =>> xFRACAS

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"Those who say something is impossible, should get out of the way of those doing it!"

- Joel Barker
Futurist – The Business of Paradigms