



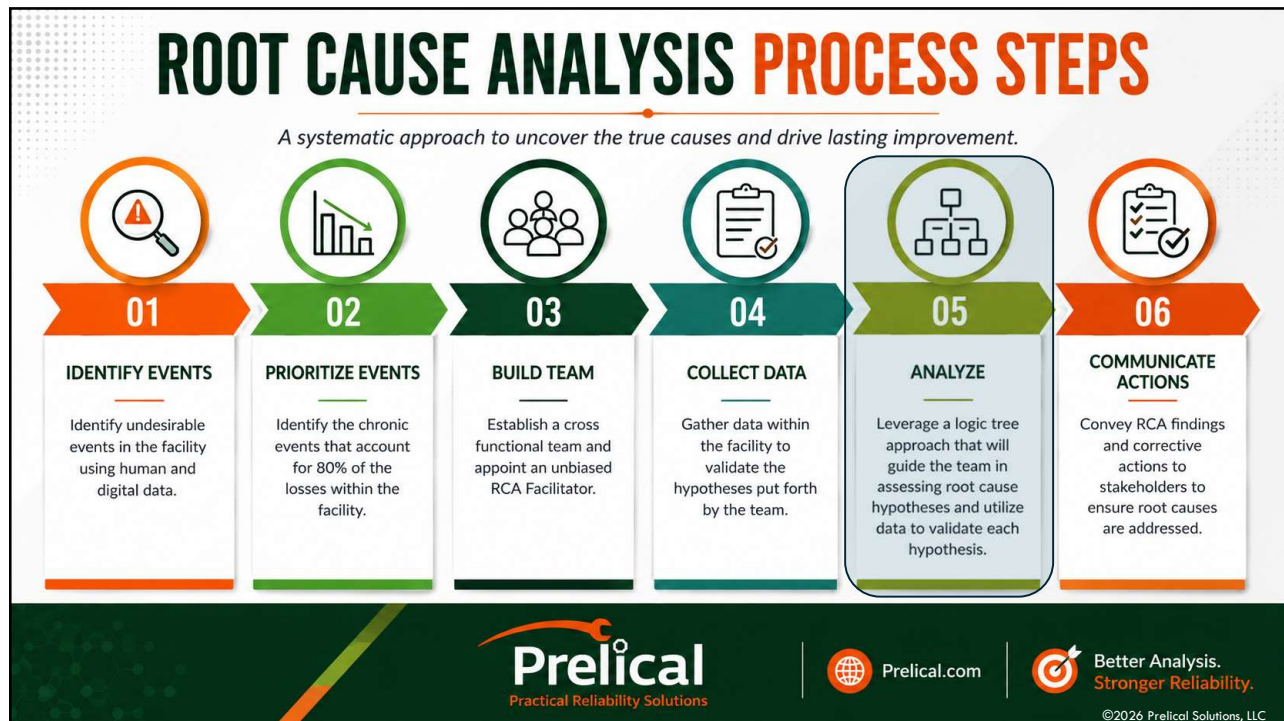


05 ANALYZE

Leverage a logic tree approach that will guide the team in assessing root cause hypotheses and utilize data to validate each hypothesis.

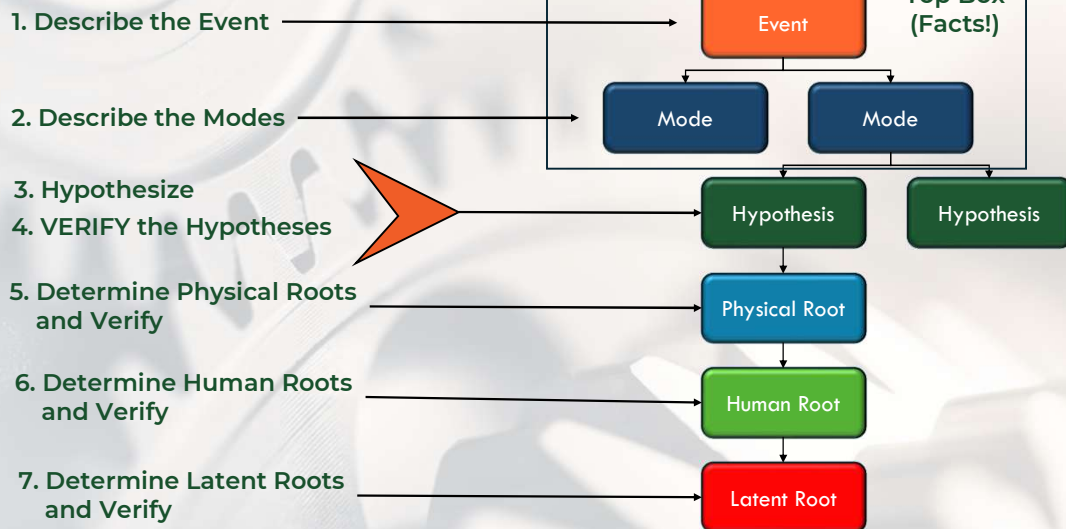


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Logic Tree Steps

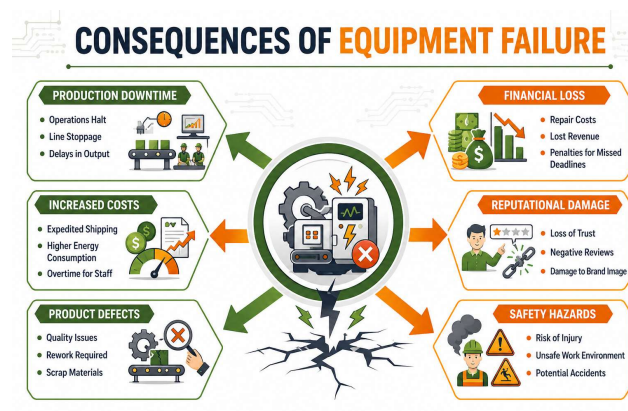


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1. Stating the Event

- The most important node on the logic tree
- Should reflect the key elements of the team's Problem Statement.
- "The Reason You Care"
- The Event description **MUST ONLY CONTAIN FACTS!!!!**



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2. Defining the Failure Mode

- Often the Mode is mistakenly identified as the Event.
- The Mode(s) are the observable failure mechanisms.
- The Mode(s) are anomalies that need to be explained.
- There can be more than 1 Mode on any given RCA.
- All Modes **MUST ONLY CONTAIN FACTS.**



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3. Hypotheses

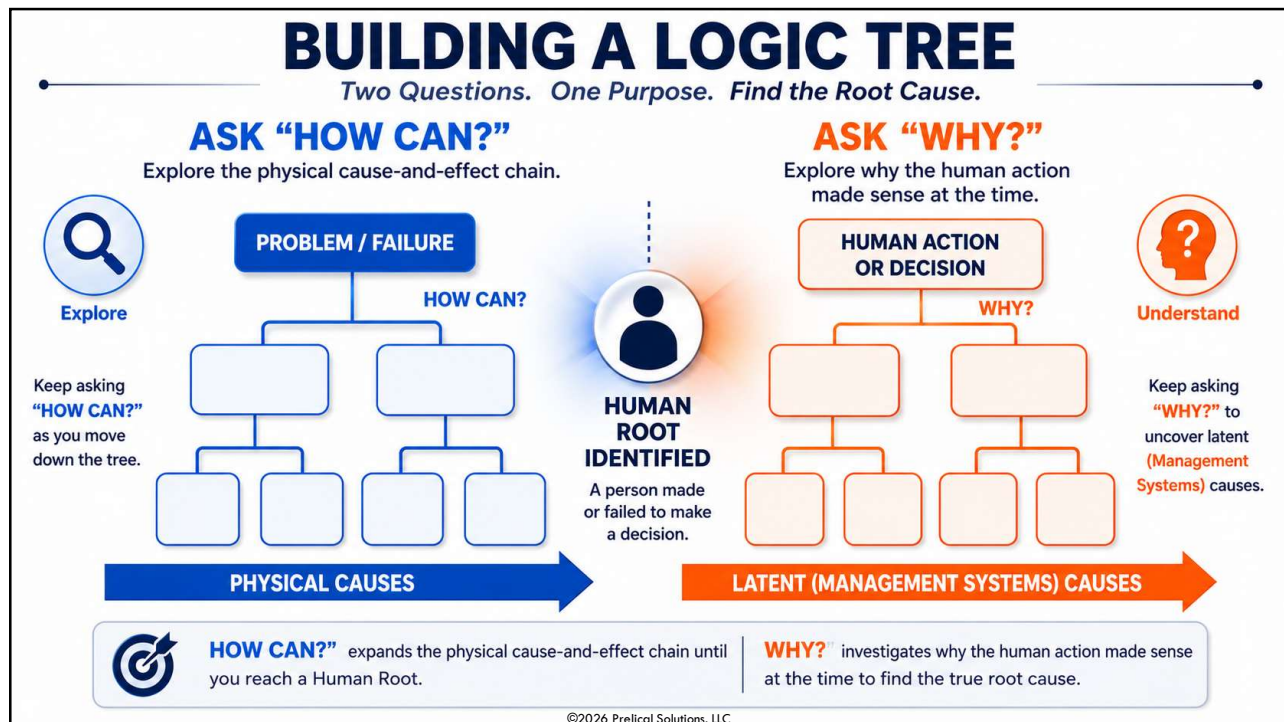
- Hypotheses are “educated guesses”.
- Ask How Can? And Why? to generate hypotheses
- The statement should reflect some type of deficiency (i.e. – lubrication Contamination vs. Lubrication)



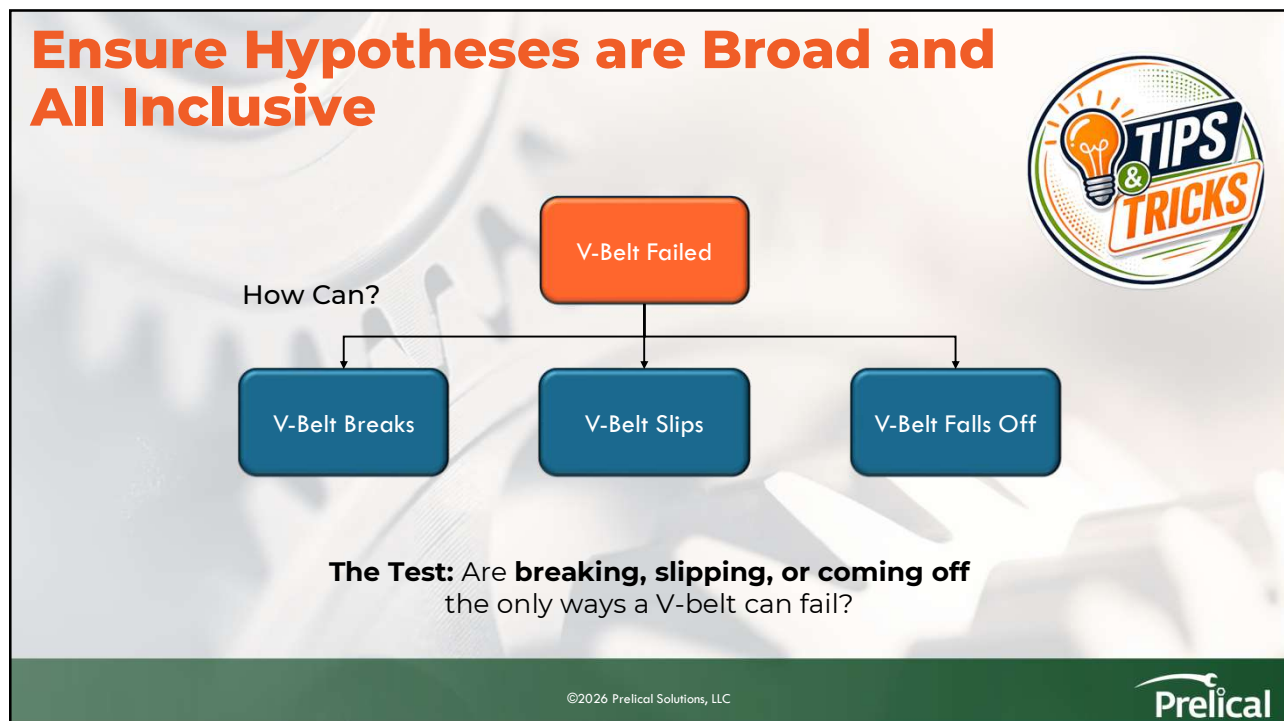
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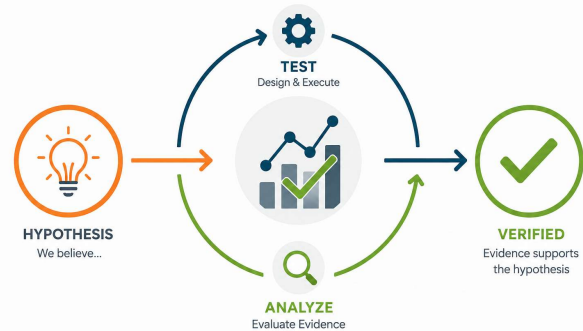
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4. Verify Hypotheses

- Every hypothesis on a logic tree should be verified true or untrue
- Utilize **whatever it takes** to ensure that your logic tree results are accurate
- Verifications can be aided by collecting the 5Ps in your data collection step
- There are numerous technologies that can be used to verify hypotheses

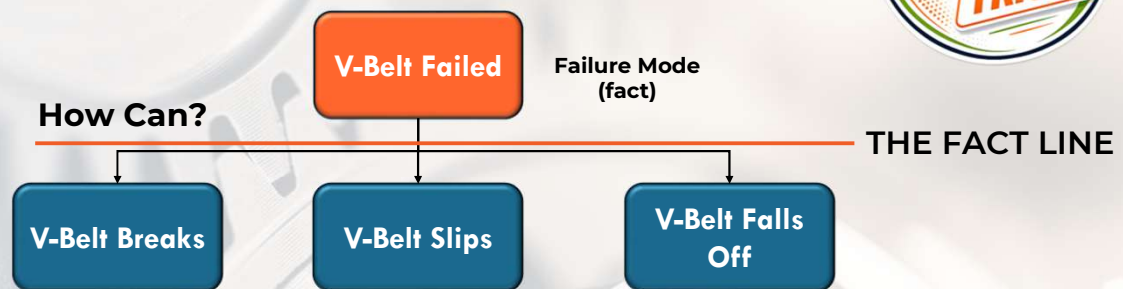


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Managing the Fact Line Verifications

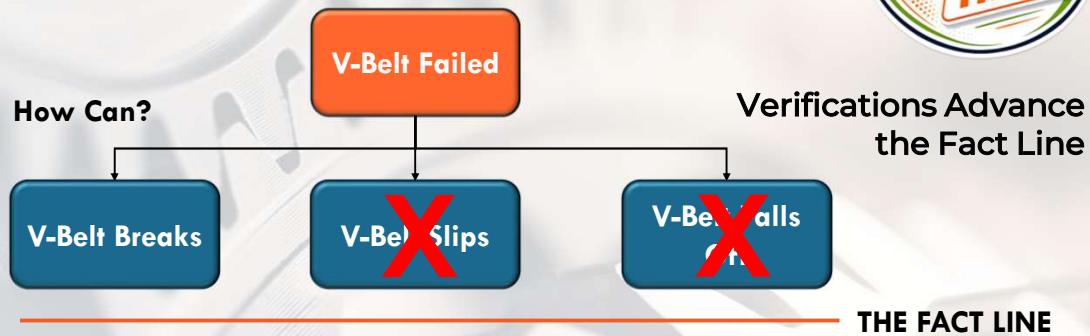


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Managing the Fact Line Verifications



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Maintain a Verification Log



Hypotheses	Verification Method	Resp.	Due Date	Completion Date	Verification Outcome
High Vibration on CP-235 Outboard Bearing	Review Vibration Alarm Limits and Histories	KCL	10.31.25	11.1.25	Review of Alarm Limits and Histories Reveals a Trending of Increased Vibration Starting on 9.23.25

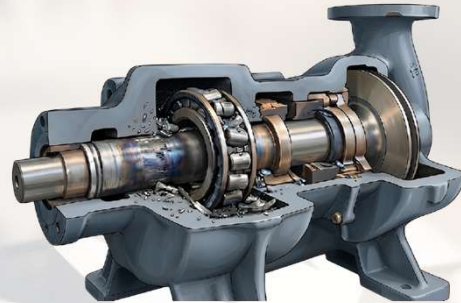
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5. Determine Physical Roots and Verify

- Physical roots are often the primary, observable consequences of decisions.
- A decision often triggered this condition to become observable (i.e. Too much lubricant).
- There can be multiple Physical roots in any given RCA.



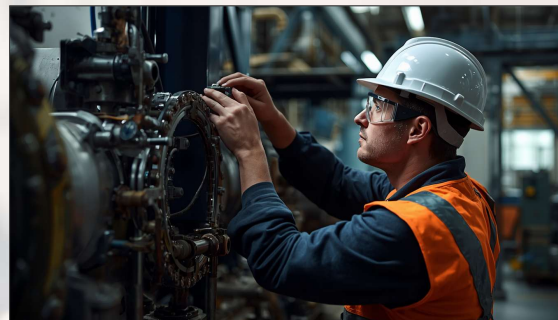
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6. Determine Human Roots and Verify

- Human roots are the choices/decisions people make, that trigger observable consequences.
- Human roots are acts of decision-making that are typically based on good intent, and often common business practices.
- Human roots are NOT the end of an analysis; they are often the beginning of the analysis.
- Unless there is malice with intent (sabotage), **BLAMING SOMEONE WILL RESULT IN A SHALLOW CAUSE ANALYSIS, NOT A ROOT CAUSE ANALYSIS!!**



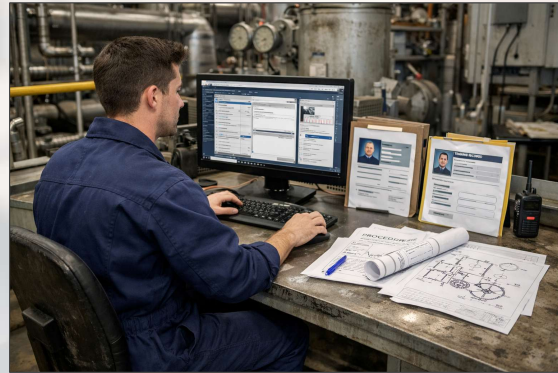
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7. Determine Latent (Systemic) Roots and Verify

- Latent roots represent the human reasoning for a decision error.
- These are the answers to '**WHY?**' people made the decisions they did, that day.
- Latent roots are often the flawed organizational systems that decision-makers relied on, to make their decision.
- Such organizational systems could be inadequate, insufficient, or non-existent.



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