



# Problem Solving vs Root Cause Analysis Vs Prevention

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## Definitions

**Correction:** Action or process of correcting/fixing something

**Prevention:** Action of stopping something from happening or arising

**ISO 9000:2015 defines these terms as follows**

**Correction:** Action to eliminate a *detected* nonconformity. (Ex: a reaction of containment and/or rework)

**Corrective Action:** Action to eliminate the *cause* of a nonconformity and to prevent (its) recurrence (Ex: a Failsafe for that cause)

**Preventive Action:** Action to eliminate the cause of a *potential* nonconformity or other potential undesirable situation (Ex: same Failsafe on other, similar offerings; Preventing a different, potential cause; Addressing a similar style of problem or effect)

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## Problem (Solving)

- A Problem is something (bad) that has happened.
- The effect(s) of it have been experienced and you need to fix it
- It is defined as a gap between the current condition (what happened) and what must be, should be, or could be and the gap must be closed
  - In today's environment, the 'should or could' be of today may become tomorrow's 'must be.'
  - Consider this when addressing Prevention



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## Root Cause Analysis

- Root Cause Analysis is the process of determining the few, fundamental causes (drivers) of an EXISTING problem
- It answers the question “Why did this *particular* manifestation of the issue happen?”
  - There is/are always 1; sometimes 2; less often, 3 reasons it was triggered
  - Found via a specific root-cause investigative methodology **best supported by having access to the problem part, or the direct data.**



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## Prevention

- There are three, basic approaches to Prevention
  - Preventing the ‘other’ reasons an actual problem could be triggered, but did not (yet)
  - Preventing same/similar causes from triggering same/similar problem elsewhere
  - Preventing problem(s) which have not yet occurred (think FMEA or other risk-management such as a Fault Tree Analysis)
    - **These last two are the most missed but critical elements of the response to an Audit finding**

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## Varied PS/RC Models

PS Wheel	PDCA	DMAIC
Step 1 ID/Select the Problem / Issue	(Plan)	Define (Select)
Step 2 Define Current State / Desired State		Measure (Collect info)
Step 3 Find Root Causes / Drivers		Analyze
--- also the <i>possible</i> Causes / Drivers		“
Step 4 Develop the Action Plans / Test Designs		“
Step 5 Implement / Run Tests	(Do)	“
Step 6 Review Results / Review Data	(Check)	“
Step 7 Make Changes / Cut in Design	(Act)	Implement
Restart the wheel	(Re/loop)	Control

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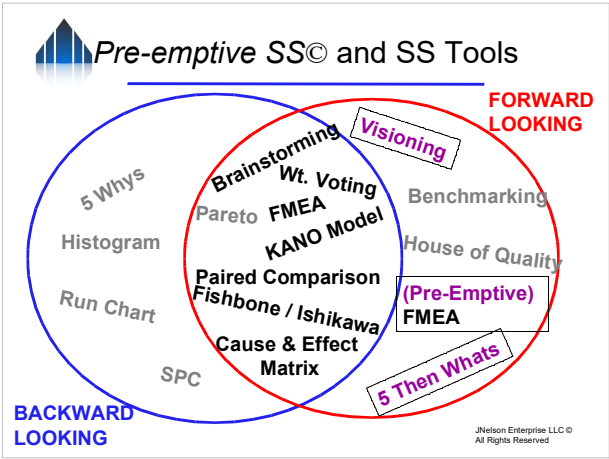
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### Pre-Emptive SS© Tools

**\*\*PreFMEA** IDs potential failures in order to refine the decision and/or implement other off-setting actions. Different evaluation than traditional FMEA

**\*\*5 And Then What's:** similar to the 5-Whys but emphasizes "what's-next?"

**\*\*Visioning:** a way to take an inclusive, higher-level and forward facing view in absence of hard data. "What's needed" to support a risk-free, no surprise implementation.

**\*\* What could have been:** a specific Brain Storming question to help ID all other, possible causes

**\*\* Where else:** a specific Brain Storming question to help ID all other places

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### FMEA v Problem Solving 1 of 2

- Both use similar tools: Fishbone Diagram, Brainstorming, Ranking of probabilities, etc
  - These are the "think about it" tools
  - In PS, there are also the 'reality tools' such as tear downs, DOE and forensic analysis
- In a FMEA, the *problem has not yet occurred*.
  - FMEA's are to *prevent* them
  - It is a desk investigation, so to speak
- In Problem solving, the tools are used to process through to a solution for an *existing* problem.

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## FMEA v Problem Solving 2 of 2

- Six Sigma Tools are like the tools in any Tool Box
  - They can be used to build a house, fix a house, fix a car or take apart a wooden box.
  - Six Sigma Tools are mostly used to solve, and to further prevent THAT problem.
  - They can also be used for pure prevention
    - Pre-Emptive Six Sigma ©



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