Problem Analysis

Describe the Problem

State the Problem

- What object (or group of objects) has the deviation?
- What deviation does it have?
- What tells us a deviation exists? (senses, measures)

Specify the Problem

- Describe as completely, factually as possible

	IS	IS NOT
WHAT	What specific object(s) has the deviation?	What similar object(s) could have the deviation, but does not?
	What is the specified deviation?	What other deviations could be observed, but are not?
WHERE	Where is the object when the deviation is observed? (geographically)	Where else could the object be when the deviation is observed, but is not?
	Where is the deviation on the object?	Where else could the deviation be located on the object, but is not?
WHEN	When was the deviation observed first? (in clock and calendar time)	When else could the deviation have been observed first, but was not?
	When since that time has the deviation been observed? What pattern?*	When since that time could the deviation have been observed, but was not? What could be the pattern?*
	When, in the object's history or life cycle, was the deviation observed first?	When else, in the object's history or life cycle, could the deviation have been observed first, but was not?
EXTENT	How many objects have the deviation?	How many objects could have the deviation, but do not?
	What is the trend* in the number of objects with the deviation?	What could be the trend* in the number of objects, but is not?
	What is the size of a single deviation?	What could be the size, but is not?
	What is the trend* in the size?	What could be the trend,* but is not?

	How many instances of the deviation are on each object?	How many instances could be on each object, but are not?
	What is the trend* in the number of instances?	What could be the trend* in the number of instances, but is not?

- Pattern* = continuous, periodic, sporadic, single occurrence
- Trend* = increasing, decreasing, stable

Identify Possible Causes

1. Use knowledge or experience, or...

- Explain how the cause creates the deviation
- What object + deviation format
- What could have caused this deviation?

2. Use distinctions and changes

- Record data, new and true, only of the IS
- What is different, odd, special, or unique about each IS compared to IS NOT?
- What changed in, on, around, or about, each distinction? When?
- How could the distinctions and changes cause the deviation?

Evaluate Possible Causes

Test possible causes against the IS / IS NOT

- Eliminate causes that cannot be explained
- If (possible cause) is the cause of (problem), then how does it explain both IS and IS NOT?
- What assumptions must be made?

Determine most probable cause

- Pick the one with the fewest assumptions
- Which possible cause best explains the IS and IS NOT?

Confirm True Cause

Verify assumptions, observe, experiment, or try a fix and monitor

- Pick the safest, easiest, quickest, cheapest, surest way to prove true cause
- What can be done to confirm true cause?

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