Finding Problem Specification Information

Purpose

To get a full and accurate description of the problem by applying the intent of the specification questions.

Introduction

One of the challenges of completing a Problem Specification is gathering data that factually describes the problem. Not only does the data have to be factual, it has to be clear, specific, and complete in order to increase your understanding of the deviation. Without this understanding, it may be difficult to identify possible causes for the deviation or to generate areas to search for distinctions. Applying the intent of the specification questions will give you the additional information required to complete a thorough Problem Specification.

Technique

To complete a Problem Specification:

- Ask questions about the identity (WHAT), location (WHERE), timing (WHEN), and size (EXTENT) of the deviation.
- Ask questions in pairs, moving from IS to IS NOT questions. Use questioning to the void to get clear, complete, and specific data.
- Record the data in answer to specification questions.
- For IS data, describe the deviation statement as specifically as possible. List descriptive facts about the defective object or the deviation itself. Do not include any information about suspected causes.
- For IS NOT data, look for something close to the IS that could be affected, but is not.
- Generate each IS NOT after identifying each IS. IS NOTs should tighten IS data, narrow the search for possible causes, and provide information for comparison.

Finding **WHAT** information to identify the object and the deviation

Use the following guidelines to prompt your thinking about the object, specifically the name of the object with the deviation and whether it is a single object or multiple objects.

IS	IS NOT
What specific object(s) has the deviation?	**What similar object(s) could reasonably have the deviation, but does not?**
Name the object no longer at Should.	Find the things most closely related to the IS that you would expect to have the same or a similar deviation, but do not.
Be as specific as possible. Describe the affected object in terms of manufacturer, catalog or serial number, version, size, color, etc.	For start-up problems, it can be difficult to find IS NOTs. Look for exactly the same type of object performing the same task. Also, prototypes, test data, manufacturing drawings, specifications, etc., can be performing at Should. If necessary, look for the same object performing a similar task, or a similar object performing the same task.
If the object is part of a larger object or system, describe only the portion known to have the problem.	
For multiple start-up problems, use the worst performer as the IS.	For multiple start-up problems, use the best performer as the IS NOT.
For fluctuating start-up problems, use the worst point of performance as the IS.	For fluctuating start-up problems, use the best nearby point of performance as the IS NOT.

Use the following guidelines to prompt your thinking about the deviation, specifically describing it in terms of sensory data.

IS	IS NOT
What is the specific deviation?	**What other deviations could reasonably be observed, but are not?**
Describe how the deviation looks, sounds, feels, tastes, or smells. Focus on describing the deviation from the Should. Describe how the deviation would be seen on videotape, in a photo, or in a drawing.	Describe other closely related conditions that might be observed on this object, but are not.

Finding **WHERE** information to locate the object and the deviation

Use the following guidelines to prompt your thinking about the location of the object with the deviation, specifically in terms of where it might be on a map, in a diagram, on a layout, etc

IS	IS NOT
Where is the object when the deviation is observed (geographically)?	**Where else could the object be when the deviation is observed, but is not?**
Name the places where a person could go to observe the object with the deviation.	Name the places where a person could expect to see the deviation, but does not.
List all locations at which the object with the deviation is observed, not simply the first place it appeared. Describe in broad and narrow geographic terms (e.g., North America; the third module on unit B).	List other locations where the object has actually been, but has not exhibited the deviation.

Use the following guidelines to define the specific location(s) on the object where you can see, hear, feel, taste, or smell the deviation.

IS	IS NOT
Where is the deviation on the object?	**Where else could the deviation be located on the object, but is not?**
Locate the parts of the object affected with the deviation. If it is localized, provide specific measurements, physical descriptions, land-marks, etc., to guide a person to the deviation.	Describe all other parts of the object that reasonably could be affected, but are not. If the entire object is affected, list only those parts that might have bee affected.

Finding **WHEN** information to identify the timing of the deviation

Use the following guidelines to identify the specific point in time when you first knew you had a problem and to focus the search for unique events or situations that may relate to the cause of the deviation.

IS	IS NOT
When was the deviation observed first (in clock and calendar time)?	**When else could the deviation have been observed first, but was not?**
Look at the Problem Statement and deter-mine when the object with the deviation was first noticed.	List all times the deviation possibly could have started, but did not.
Avoid describing time in relation to events. Clock times and calendar time will offer the greatest benefit time when developing and testing possible causes.	
For recurring problems, note the time the de-viation first appeared and how long it lasted.	
For fluctuating start-up problems, note the time of the poorest performance.	For fluctuating start-up problems, note the significantly better performance in close proximity to the poorest performance.

Use the following guidelines to spot similarities between unique events or situations that may relate to the cause of the deviation, and to help predict when the deviation will occur again so you can collect firsthand data.

IS	IS 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?**
Look for data in terms of patterns of time (continuous, periodic, sporadic, single occurrence). Note if the problem has been continuous. If the deviation has been periodic or sporadic, identify the start and end date and time of recurring deviations and the frequency of occurrence. Refer to run or control charts if available.	Identify patterns in timing that could be expected but are not seen.
View a long enough time frame to spot patterns if they exist.	

Use the following guidelines to prompt your thinking around the life cycle of an object to correlate the timing of the deviation with specific events in the object's history, and to help narrow the search for relevant changes and causes.

IS	IS NOT
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?**
Place the timing of the deviation in terms of events in time. Consider what the object is doing or what is being done to the object. Locate the occurrence in a process. Several life cycles can usually be identified. Any factual life cycle information can help find and understand the true cause.	Identify the points in production, use, function, testing, shipping, age, etc., where the deviation would have been expected to first appear, but was not seen. Note steps, stages, speeds, operations, functions, conditions when the deviation could have occurred, but did not.
The answer will often begin with "before, during, after, while...."	
Identify the steps, stages, speeds, operations, functions, etc., associated with the object when the deviation occurs. Look for events in the location of the object when the deviation occurs. Look for events with timing that coincides with the occurrence of the deviation.	
For recurring problems, look for events that coincide with each occurrence of the deviation.	
For products, consider how long the product has been in production when the deviation first occurred. Also consider the age of the product, the version or lot, and its use from design through disposal.	
For equipment, consider the age of the equipment, hours of usage, and production cycles performed when the deviation first occurred. Also consider the precise function and job the equipment is performing, and any maintenance that has recently been performed.	
For continuous process flows, consider the age of the process when the deviation first occurred. Consider how much flow occurred prior to the deviation and the speed, quantity, and function at the point the deviation occurred.	

The history or life cycle question is very situational. The intent behind the question is based upon what type of object is found in the Problem Statement.

*If the object is a **product** (some item which starts "raw" and moves through stages to reach a finished form)*

- How long had this type of product been in production at this site before this problem occurred for the first time?
- How old is each affected product when the problem is first detected?
- At what stage of assembly or manufacturing is the product when the problem is first detected?
- Identify precisely when in the stage of manufacturing the problem is first detected.

*If the object is a **piece of equipment***

- How old was the equipment when this problem occurred for the first time?
- How many hours (or such data) of usage had the equipment accomplished before this problem occurred for the first time?
- What is the precise operational function or running speed (or such data) at which this problem occurs?
- What is the machine doing or having done to it when the problem occurs?

*If the object is **something that depicts flow** (electricity, hydraulics, process lines)*

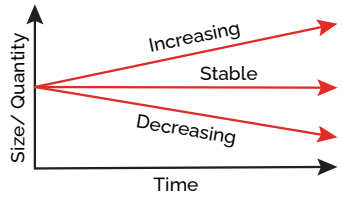
- How old was the item (or how long had it been installed) before the problem occurred for the first time?
- How much "flow" had occurred before the problem happened for the first time? If a problem recurs, how much "flow" occurs between each event?
- What "flow" function or cycle was occurring when this problem happened for the first time?
- Identify precisely when within the function or cycle the problem is first detected.
- What "flow" function or cycle was occurring at each subsequent happening of this problem?

*If the object is some component in a **computer system***

- How long had this system used this software before the problem occurred for the first time? How long had the system been in continuous use before this problem occurred for the first time?
- If intermittent, how long is it in use before each subsequent occurrence of the problem?
- What system function or instruction was being performed when the problem first occurred?

Finding **EXTENT** information to determine the magnitude of the problem

Use the following guidelines to determine the size of the problem and the direction it is headed,and to help understand the priority to resolve it.

IS	IS NOT
How many objects have the deviation?	**How many objects could have the deviation, but do not?**
Consider an absolute count or the percentage of objects with the deviation. Use production runs, lots, shift output, pareto, and run charts, etc. Note whether data is factual or approximate.	The total number or percentage of objects in question that could have the deviation, but do not.
What is the trend in the number of objects that have the deviation?	**What could be the trend in the number of objects that have the deviation, but is not?**
The actual growth rate—either increasing, decreasing, or stable—in the number of objects affected by the problem. Use numerical data when possible. 	Trends that could be expected in the number of objects with the deviation, but are not seen.
What is the size of a single deviation?	**What could be the size of a single deviation, but is not?**
An actual measurement of the dimensions of the deviation. Note the range of sizes.	Other sizes of deviations that could reasonably be expected, but are not seen.
What is the trend in the size of a single deviation?	What could be the trend in the size of a single deviation, but is not?
The actual growth rate—either increasing, decreasing, or stable—in the size the single deviation. Use numerical data when possible.	Trend that could be expected in the size of a single deviation, but are not seen.
How many instances of the deviation are on each object?	**How many instances of the deviation could there be on each object, but are not?**
The actual count of the number of deviations on any object, or the number of occurrences. Note the range if the number varies.	The number of deviations that could be expected, but are not seen.
What is the trend in the number of instances of the deviation on each object?	**What could be the trend in the number of instances of the deviation on each object, but is not?**
The actual growth rate—either increasing, decreasing, or stable—in the number of instances of the deviation per object. Use numerical data when possible.	Trends that could be expected in the number of deviations per object, but are not seen.

Instructions

1. Identify a recent problem where cause is not known.

   a. What is the Problem Statement?

2. Specify the problem.

   a. How will you specify the IS and IS NOT information for the object and the deviation in the Problem Statement? What sources of information will you need to gather the WHAT information to complete the specification?

   b. How will you specify the IS and IS NOT information for the location of the deviation? What sources of information will you need to gather the WHERE information to complete the specification?

   c. How will you specify the IS and IS NOT information for the timing of the deviation? What sources of information will you need to gather the WHEN information to complete the specification?

   d. How will you specify the IS and IS NOT information for the magnitude of the deviation? What sources of information will you need to gather the EXTENT information to complete the specification?