

Root Cause

just trying to get it right

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Types of approaches we have used

- The 5 WHYS
- Why what, Why when, Why where
- Is / Is not

The 5 Why Concept

1. Why
2. Why
3. Why
4. Why
5. Why

Received our training at a local ASQ meeting.

The Why (what, when, where)

1. Why what
2. Why when
3. Why where

Training by a hired consultant.

“Is/Is Not” Approach

Process used in our Quality Management System.

Useful References

- ❖ ASQ – Canada Toronto Section – “IS-IS NOT TOOL”
- ❖ Elsmar.com - Is/Is Not Questions
- ❖ Master Control – White Paper – Foolproof Investigations: A Proven Approach for Root Cause Analysis in a Regulated Environment – by Ken Peterson - mastercontrol.com

Example:

Problem Analysis (Is - Is not)

Problem Identification:

One wheel of the car is giving continuous abnormal sound

Specify the problem:

	IS	IS NOT	Possible Cause	Does not Explain Is and Is not information	Does Explain Is and Is not information
WHAT					
object	Wheel	Engine, transmission etc	Unbalanced	Verified - N/A	
Deviation	Abnormal continuous sound	interupped, periodic sound	Air Pressure out of spec.	Veified - N/A	
WHERE					
Location	Front Drive side	Front Passenger side or back	Broken / Ripped Tire		Verified - Broken / Ripped Tire
Object	Tire	Rim , Tire cover	Punctured / Nail	Verified - N/A	
WHEN					
First Occurance	Two days ago	Last week	Hit wth curb		
Since Time	Coming back from work	Going to work			
Life cycle					
SCOPE					
Quantity Affected	One wheel	All Wheels			
Size of deviation	1 Tire	4 Tire			
No. of Deviations	1	4			
Trend if any	N/A	N/A			

Potentail Root cause of the problem: Broken/ Ripped Tire

Is / Is Not Questions

	Is	Is Not
What:	What is the object you are having a problem with?	What could be happening but is not?
	What is the problem concern?	What could be the problem concern, but is not?
Where:	Where do you see the concern on the object? Be specific in terms of inside to outside, end to end, etc.	Where on the object is the problem NOT seen? Does the problem cover the entire object?
	Where (geographically) can you take me to show me the problem? Where did you first see it?	Where else could you have observed the defective object, but did not?
When:	When in time did you first notice the problem? Be as specific as you can about the day and time.	When in time could it have first been observed, but was not?
	At what step in the process, life or operating cycle do you first see the problem?	Where else in the process, life or operating cycle might you have observed the problem, but did not?
	Since you first saw it, what have you seen? Be specific about minutes, hours, days, months. Can you plot trends?	What other times could you have observed it but did not?
How Big:	How much of each object has the defect?	How many objects could be defective, but aren't?
	What is the trend? Has it leveled off? Has it gone away? Is it getting worse?	What other trends could have been observed, but were not?
	How many objects have the defect?	How many objects could have had the defect, but didn't?
	How many defects do you see on each object?	How many defects per object could be there, but are not?
	How big is the defect in terms of people, time, \$ and/or other resources?	How big could the defect be, but is not?
	What percent is the defect in relation to the problem?	

The Process

- Identify the issue
- Define the problem
- Evaluate Risk
 - ❑ Track and Trend
 - ❑ Not do anything – close it out
 - ❑ Go to CAPA

The Process - investigation

- Input – non-conformance, deviations, audits, complaints, incidents, out-of-spec
- Problem statement
- Observed “Is” facts
- Comparative “Is Not” facts
- Clues
- Likely causes
- Testing the likely causes

❖ Ken Peterson's White Paper

The Process

- Identify the issue
- Define the problem
- Evaluate Risk
- ***ROOT CAUSE Analysis - IS / IS NOT***
- Corrective / Preventive Action
- Implement
- Monitor

Root Cause Analysis using Is/Is Not

PROBLEM STATEMENT:		
IS (observations)	IS NOT (comparisons)	Clues (what is different/unique about is vs. is not data)
What:	What:	Changes in Man, Methods, Materials, Machines?
What is the object affected?	What other similar objects could be affected but are not?	
What exactly is wrong?	What else could be going wrong but isn't?	
Where:	Where:	
Where would you go to observe the problem?	Where else could I expect to see this problem occur but don't?	
Where on the object would you point?	Where else on the object could this problem occur but isn't?	
When:	When:	
When did the problem first occur or was first reported?	When else could the problem have occurred but didn't?	
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence)	When else in the use, process flow or life cycle could the problem occur but doesn't?	
How does the problem repeat itself?	How else could the problem repeat itself but doesn't?	
Weight:	Weight:	
How big is the problem?	How big could it be? (compare to standard)	

Define the Problem

My headlights are not working on my car.

IS

PROBLEM STATEMENT:		
IS (observations)	IS NOT (comparisons)	Clues (what is different/unique about is vs. is not data)
What:	What:	Changes in Man, Methods, Materials, Machines?
What is the object affected?	What other similar objects could be affected but are not?	
What exactly is wrong?	What else could be going wrong but isn't?	
Where:	Where:	Clues
Where would you go to observe the problem?	Where else could I expect to see this problem occur but don't?	
Where on the object would you point?	Where else on the object could this problem occur but isn't?	
When:	When:	Clues
When did the problem first occur or was first reported?	When else could the problem have occurred but didn't?	
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence)	When else in the use, process flow or life cycle could the problem occur but doesn't?	
How does the problem repeat itself?	How else could the problem repeat itself but doesn't?	
Weight:	Weight:	
How big is the problem?	How big could it be? (compare to standard)	

IS (observations)
What:
What is the object affected? <i>Headlights on my car.</i>
What exactly is wrong? <i>No Lights when I turn the headlight switch to on</i>
Where:
Where would you go to observe the problem? <i>Headlight</i>
Where on the object would you point? <i>Switch for the headlights</i>
When:
When did the problem first occur or was first reported? <i>Later yesterday at 5:30 P.M. in heavy traffic.</i>
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence) <i>Random</i>
How does the problem repeat itself? <i>Its never happened before.</i>

Weight:
How big is the problem? <i>Can't drive at night except with high beams</i>

Is Not

PROBLEM STATEMENT:		
IS (observations)	IS NOT (comparisons)	Clues (what is different/unique about is vs. is not data)
What:	What:	Changes in Man, Methods, Materials, Machines?
What is the object affected?	What other similar objects could be affected but are not?	
What exactly is wrong?	What else could be going wrong but isn't?	
Where:	Where:	Clues
Where would you go to observe the problem?	Where else could I expect to see this problem occur but don't?	
Where on the object would you point?	Where else on the object could this problem occur but isn't?	
When:	When:	Clues
When did the problem first occur or was first reported?	When else could the problem have occurred but didn't?	
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence)	When else in the use, process flow or life cycle could the problem occur but doesn't?	
How does the problem repeat itself?	How else could the problem repeat itself but doesn't?	
Weight:	Weight:	
How big is the problem?	How big could it be? (compare to standard)	

IS NOT (comparisons)	
What:	
What other similar objects could be affected but are not? <i>Tail lights work, turn signals work</i>	
What else could be going wrong but isn't? <i>High Beam lights work when I hit the high beam switch</i>	
Where:	
Where else could I expect to see this problem occur but don't? <i>Other electrical devices in car are working (interior lights, radio etc.)</i>	
Where else on the object could this problem occur but isn't? <i>Switches for the high beams, tail lights and signals</i>	
When:	
When else could the problem have occurred but didn't? <i>This morning</i>	
When else in the use, process flow or life cycle could the problem occur but doesn't? <i>Cyclical, continuous</i>	
How else could the problem repeat itself but doesn't? <i>Prior to yesterday afternoon</i>	

Weight:
How big could it be? (compare to standard) <i>The high beams could fail and I'd have no lights.</i>

Clues

PROBLEM STATEMENT:		
IS (observations)	IS NOT (comparisons)	Clues (what is different/unique about is vs. is not data)
What:	What:	Changes in Man, Methods, Materials, Machines?
What is the object affected?	What other similar objects could be affected but are not?	
What exactly is wrong?	What else could be going wrong but isn't?	
Where:	Where:	Clues
Where would you go to observe the problem?	Where else could I expect to see this problem occur but don't?	
Where on the object would you point?	Where else on the object could this problem occur but isn't?	
When:	When:	Clues
When did the problem first occur or was first reported?	When else could the problem have occurred but didn't?	
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence)	When else in the use, process flow or life cycle could the problem occur but doesn't?	
How does the problem repeat itself?	How else could the problem repeat itself but doesn't?	
Weight:	Weight:	
How big is the problem?	How big could it be? (compare to standard)	



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Clues (what is different/unique about is vs. is not data)

Changes in Man, Methods, Materials, Machines?

It's limited to my headlights and not the high beams or tail lights or signals.

The high beams are on a separate switch.

The car is a 1979 Pontiac.

Clues

The electrical system has power so it's not the battery.

Problem seems isolated to the headlight switch.

Clues

We had a heavy mix of sleet, rain and snow on the afternoon drive home. It was clear on the drive in yesterday morning and this morning.

PROBLEM STATEMENT: My headlights are not working in my car		
IS (observations)	IS NOT (comparisons)	Clues (what is different/unique about is vs. is not data)
What:	What:	Changes in Man, Methods, Materials, Machines?
What is the object affected? Headlights on my car.	What other similar objects could be affected but are not? Tail lights work, turn signals work	It's limited to my headlights and not the high beams or tail lights or signals. The high beams are on a separate switch than the headlights.
What exactly is wrong? No Lights when I turn them to the on	What else could be going wrong but isn't? High Beams light when I hit the high beam switch	The car is a 1979 Pontiac
Where:	Where:	Clues
Where would you go to observe the problem? The light switch	Where else could I expect to see this problem occur but don't? Other electrical devices in car are working (interior lights, radio etc.)	The electrical has power so it's not the battery. Problem seems isolated to the headlight switch.
Where on the object would you point? Switch for the headlights	Where else on the object could this problem occur but isn't? Switches for the high beams, tail lights and signals	
When:	When:	Clues
When did the problem first occur or was first reported? This evening at 5:30 P.M. in heavy traffic.	When else could the problem have occurred but didn't? This morning I didn't notice the problem.	We had a heavy mix of sleet, rain and snow on the afternoon drive home.
When in the use, process flow or life cycle does the problem occur? (map/chart event sequence) Random	When else in the use, process flow or life cycle could the problem occur but doesn't? Cyclical, continuous	
How does the problem repeat itself? Never happened before	How else could the problem repeat itself but doesn't? Prior to this evening	



Identify the likely causes

1. Faulty Headlight Switch
2. Electrical connections to headlights

Test the likely causes

Does the likely cause explain
the facts?

Example:

Problem Analysis (Is - Is not)

Problem Identification:

One wheel of the car is giving continuous abnormal sound

Specify the problem:

	IS	IS NOT	Possible Cause	Does not Explain Is and Is not information	Does Explain Is and Is not information
WHAT					
object	Wheel	Engine, transmission etc	Unbalanced	Verified - N/A	
Deviation	Abnormal continuous sound	interupped, periodic sound	Air Pressure out of spec.	Veified - N/A	
WHERE					
Location	Front Drive side	Front Passenger side or back	Broken / Ripped Tire		Verified - Broken / Ripped Tire
Object	Tire	Rim , Tire cover	Punctured / Nail	Verified - N/A	
WHEN					
First Occurance	Two days ago	Last week	Hit wth curb		
Since Time	Coming back from work	Going to work			
Life cycle					
SCOPE					
Quantity Affected	One wheel	All Wheels			
Size of deviation	1 Tire	4 Tire			
No. of Deviations	1	4			
Trend if any	N/A	N/A			

Potentail Root cause of the problem: Broken/ Ripped Tire

Identify Likely Causes	TEST: If two or more fail, wrong likely cause		
Faulty Headlight Switch	What:	Pass	Fail
	Where:	Pass	Fail
	When:	Pass	Fail
	Weight:	Pass	Fail
Electrical connection to headlights	What:	Pass	Fail
	Where:	Pass	Fail
	When:	Pass	Fail
	Weight:	Pass	Fail

