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ROOT CAUSE ANALYSIS (RCA) TEMPLATE	
This template provides the key stages of a root cause analysis (RCA). Once the cause of a problem has been identified you then define the necessary follow-up actions required to address it. This enables you and your organization to build on and learn from such experiences.	
PROJECT TITLE:	DATE:
EVENT DESCRIPTION	
TIMELINE LEADING UP TO THE EVENT	
Date	Sequence of Events
TIMELINE LEADING UP TO THE EVENT	
Date	Sequence of Events
INVESTIGATIVE TEAM	METHODS USED

National Patient Safety Agency

**Concise Investigation Report Template – Summary Guidance**

The following format and headings are designed to improve the recording and standardisation of information in investigation reports (including multi-incident investigations), and to facilitate collection and learning from findings. These headings will continue to be evaluated and developed over time.

Write your investigation report in the blank template which accompanies this guidance

1. Refer to quick ref. guidance here in green below as you go.
2. For detailed guidance refer to the NPSA's 'RCA investigation report writing guidance' document

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**Root Cause Analysis Investigation Report**

<b>Incident description and consequences</b>
Incident description:
Concise description of the incident.
Example only A lady with asthma sustained brain damage following IV administration of a drug to which she was known to be allergic.
Incident date:
Incident type:
Specialty:
Actual effect on patient:
Actual severity of the incident:
Level of investigation
Level 1 - Concise Investigation
Involvement and support of patient and relatives
e.g. Meetings to discuss questions the patient anticipates the investigation will address and to hear their recollection of events (anonymised in line with the patient / relatives wishes).
e.g. Family liaison person appointed, information given on sources of independent support.
<b>FINDINGS:-</b>
<b>Detection of incident</b>
Note the point in the patient's treatment AND the method by which the incident was identified. See NPSA 'Detection Factors' tool for a list of options. <a href="http://www.npsa.nhs.uk/rca">www.npsa.nhs.uk/rca</a>
<b>Care and service delivery problems</b>
A themed list or description of the key problem points, expressed as care and service problems, (example here in green).
Example only (please delete and add your own findings)
Nurses on the short stay ward routinely failed to complete the section in the patient notes to highlight the existence of known allergies
<b>Contributory factors</b>



## Root Cause Analysis Template

Level of Analysis		Questions	Findings	Root Cause	Ask	Take
				Caus #?	"Why?" =	Actio n
What happened?	Sentinel Event	What are the details of the event? (Brief description)				
		When did the event occur? (Date, day of week, time)				
		What area/service was impacted?				
Why did it happen?	The process or activity in which the event occurred.	What are the steps in the process, as designed? (A flow diagram may be used.)				
What were the most proximate factors?		What steps were involved in (contributed to) the event?				
(Typically "special cause" variation)	Human factors	What human factors were relevant to the outcome?				
	Equipment factors	How did the equipment performance affect the outcome?				
	Controllable environmental factors	What factors directly affected the outcome?				
	Uncontrollable	Are they truly beyond				

Q. Ref.	FAE Ref.	FAE Ref.	Revised Question	AIM Ref.	Previous Question (if appropriate)	Area of Contribution	Comment
<b>ASSET MANAGEMENT POLICY AND STRATEGY</b>							
A1	4.2	4.2.1	Asset Management Policy	4.2.1	Asset Management Policy		
A1	4.2	4.2.1	Asset Management Policy	4.2.1	Asset Management Policy		
A1	4.2	4.2.1	Asset Management Policy	4.2.1	Asset Management Policy		

But why did that error occur? This focuses the heat of the oven on the engine, sometimes causing a fire. But that didn't happen. But, as you'll see, many companies are not willing to use root cause analysis at a management level. Car Fire Not what you want happening on your assembly line! David Shankbone (CC BY), via Flickr Key Terms Good engineering requires very precise use of language. Otherwise, the problem will recur if a new employee takes on that particular job. There is another solution, as well. At a certain stage, some of the cars, the ones getting a clear coat, are driven into an oven to heat and fuse the paint coating on the body of the car. He would have to come up with a different counting method, but that's his problem. In fact, it would probably be best to put both solutions in place. What is under the hood, and how is it different? Even everyday words like "why" and "defect" and "error" are given precise meanings. He found them in crates, with a note, "Every tenth blanket turned upside-down for counting purposes." The back of every blanket was painted with a big orange X to say, "This Side Down." But every tenth blanket was upside-down. So, the question "why?" really means, precisely, "What is the difference in process that leads to a difference in result?" Or, "What error in process leads to a defective result?" In examining a process, we look at inputs, work process, outputs, tools, techniques, resources, and the work environment. Only the upside-down thermal blanket was a defect. So, if we can find the deep root of a problem, we can solve it once and for all. So we call the technique of repeated investigation into causes The Five Whys. Our Case Study: Cars on Fire A colleague of mine and quality engineer, Jim Sorensen, was called in on a special engineering project that illustrates Root Cause Analysis. And, usually, the deeper solutions actually cost less than the more expensive remedies that we've tried so, the first step in creating inexpensive, permanent solutions is to find the deep cause, or root cause of the problem. Things began to make sense. Telling the installer is not enough. A reversed thermal blanket would focus the heat of the oven downward, onto the engine. If we don't know why a problem is happening, we use root cause analysis to solve the mystery. What if the manager had asked the right question: Why do problems like this occur in my factory? The inner, or bottom, layer of the hood was in place. And problems like this do tend to come back and haunt us. The Mystery That Remains If the reversed blanket was the only cause of the fires, then one car in every ten would have caught fire. At some point, we come to a simple, obvious factor that can easily be managed and changed. Usually, this is also the lowest-cost solution. "Why do things always go wrong?" is too vague and general to be useful. Because jobs were not defined with enough precision, and workers were not empowered by being told why they were doing what they were doing and not told fully correctly how to do it. So they only worked right if they were installed right-side up. Jim traced the blankets back to the loading dock where they came from the sub-contractor who manufactured them. Only the harness that went right on top of the engine, closest to the hood, was in danger of catching fire. And the Five Whys - asking why? Knowing the root cause, we can eliminate the source of the defects once, and permanently. Because the corporate culture is focused on blame, and not on genuine understanding. If we can answer this question, we can change the process, prevent the error, and eliminate the defect. More About the Solution Actually, the solution is not as easy as it seems. Why is there a problem? The biggest problem with the idea of placing blame is that usually "the you know what" rolls downhill and the little guy who put the blanket in wrong gets "the blame". This leads to a rather obvious solution: Tell the installer of the blanket to make sure that the side of the blanket with the big orange X is facing down, on the bottom side of the hood, towards the engine. Asking the Right "Why?" "Why" may seem like a simple word, but it is not. There are many ways of asking "why?" that give no useful answer: "Why me?" is victim thinking. Why doesn't the installer tell me right-side up? It must be under the hood. Each worker could know how his job is supposed to be done, and be sure to do it right. In engineering, it is used to get to the root of one particular problem. Answer: It's not visible at the oven where the process occurs. If we thought we fixed a problem, and it keeps coming back, it's a sticky problem. Often, the output of one process is the input to the next process. With genuine understanding as a goal, we could cooperate as a team. "Why am I doing this?" can be a useful question if it means, "How does this benefit me or my customers?" But that is part of executive management, not quality management. He wondered why? These thermal blankets were designed to radiate heat from the engine up into the air, and also to reflect the heat of sunlight away from the engine. That is usually at the point where we have asked "why?" five times. Problems in business are like acne on a teenager's face, I guess, or dandelions in a garden. But if you dig all the way down and pull out a dandelion root and all, it doesn't grow back. What variation in process produced a result that led to a defect? Here are the terms you need to know. Problem: something going wrong that creates bad products or delays or waste, costing us money. Process: a series of steps of work, such as happen on an assembly line, or when processing an insurance claim. Product, Result, Output, Deliverable: The result of a process or a step in a process. We would have transparent processes and see why defects occur much more easily. That would begin a management root cause analysis. The Management Five Whys Here we go: Why did we have random fires breaking out with no discernible cause? Our case study will show how to use a root cause analysis both ways. When we use a root cause analysis to both eliminate a problem and also eliminate many similar problems, we see a huge improvement in quality and value at very low cost. What variation in process made "a difference that made a difference" (Gregory Bateson, his definition of information). Then the top of the hood was fastened down over the thermal blanket. We then began looking for the error, that is, the step of the process done in such a way that it produces a defect. The key is that the defective results is different from the results where the product works. He traced the assembly line process backwards. One of the stations did the work of assembling the layers of the hood. No one told him that the blanket needed to be placed with the big orange X facing down. Content is for informational or entertainment purposes only and does not substitute for personal counsel or professional advice in business, financial, legal, or technical matters. Sid Kemp (author) from Boca Raton, Florida (near Miami and Palm Beach) on September 26, 2012: Hi Cygnets! Well put! The "no blame environment" is the central feature of all my consulting work. Cygnets Brown from Springfield, Missouri on September 26, 2012: Well written, detailed article! I especially like the last paragraph where you talk about placing blame. Who's fault is this? "Now, we will go on an imaginary journey. Because we are operating in a blame environment, where the most senior person asks, "Who's fault is it?" Why is the senior manager thinking in terms of blame? There is a thermal blanket that is upside down about one time in ten. Whether we see this as implementing Six Sigma across the organization or growing in capability through the Capability Maturity Model (CMM), either way, we are improving operations by integrating the wisdom of what was originally called Total Quality Management (TQM) into our operations management. Did you know the Five Whys? This article is accurate and true to the best of the author's knowledge. Why not? The answer turned out to be that the increased heat from the reversed blanket heated up the engine. The "why" in quality management is very specific. He found that the sub-contractor was delivering the blankets to specification: There was nothing in the contract that said that the blankets had to all be turned right-side up, only that the bottom side needed to have a big orange X on it, which it did. So, here are the Five Whys in Jim's process: Why are these cars catching fire, and not others? "Why does God let this happen?" is about justice and in the field of religion, but not part of engineering. Depending on different added features, different harnesses were used. There was an unusual problem on an automobile assembly line. At random, cars were catching on fire. Preventing a problem from ever occurring is usually less costly than letting it happen, and then dealing with it after the fact. Root cause analysis can also be used at a management level to eliminate a problem and also prevent many other problems of a similar nature. Why did we not know the details of our own process? Why is it not visible? The Operations Manager said, "Who's fault is this?" The answer was quite clear, though Jim didn't say it. Because we made assumptions, instead of carefully documenting procedures at an engineering level in a clear, aware way. Why is the blanket installed upside-down? We could re-write the contract with the sub-contractor of the blankets, requiring him to deliver all blankets right-side up. The written Standard Operating Procedure for that job must be re-written. A worker placed a thermal blanket on top of the hood. The answer was, "Your fault, sir." Only the Operations Manager can know enough about the flow of all operations to make sure that the output of one process is a correct input for the next process. Note that the manager asked the wrong question. Then we get the problem unstuck, and it doesn't come back. Root Cause Analysis Works in Two Directions Root cause analysis can be used in two different ways. But the pattern appeared completely random: A few cars burned up in each oven, and no one could see what made those cars different from any other cars going into the oven, nor could they find a difference in the way the oven was working. Jim was called in to find the problem and propose a solution. Jim spent three weeks sitting on a stool, watching cars go into the oven. This does all we can do to reduce the chances of the problem recurring. He did not ask, "Why?" He asked "Who? And that was why Jim saw a big orange X on the thermal blanket going under the hood. Model T Ford cars were manufactured from 1908 to 1927, and had no car fires, as far as I know. The End of Our Story Jim brought the results of his analysis back to the Operations Manager who had hired him. We know that, some of the time, we have a defective output. Once we have a difference that correlates with the production of the defect, we have a possible cause. Why did that happen? Jim noticed that every tenth blanket had a big orange X on it. We would be empowered to raise questions about variability in process early, instead of just doing our jobs in a mechanical way. So preventing that one error - upside-down installation of the thermal blanket - prevented cars from catching fire or having melted wires. A diorama of the Model T assembly line. And some of those harnesses only had wire melt problems, not a visible fire. There were three identical ovens working right next to each other. To find that out, we ask "why?" again, repeating the process. You think they solve them, and, oops! they show up again. Ideally what should happen is that everyone from the "little guy at the bottom" to the president of the company "takes responsibility" and as you suggest, instead blame rolling downhill, responsibility goes up the chain. In fact, the manufacturer hunted down those cars and replaced the wiring before the cars were sold. So, the only cars that caught fire had a clear coat (so that they went into the oven) A particular wire harness (with wires close to the hood that might catch fire) An invisible upside-down thermal blanket sealed inside the hood The wire harness and clear coat were standard options. Some of the cars burst into flames in each oven. Problems have a nasty way of coming back to haunt you. Why did we make assumptions? Sometimes we need fewer than five repetitions of the question "why?" Very rarely, we need more. The only clue was that all the fires started at the same location, under the hood, on the engine. Jim began to dig deeper. At a management level, the 5 Whys consistently demonstrate that well-defined, repeatable processes are the beginning of effective operations that deliver high-quality results at low cost. We take this further by working as a team to create continuous improvement. We use root cause analysis to discover the real, deepest (root) cause, and take care of that. On those occasions, there must be some difference in the work process, or the inputs, or the techniques being used, or the tools, resources, or work environment. And the final output is the product for the customer. Defect: A quality of a product that does not work, that does not meet requirements or customer specifications. Error: A flaw in a process that leads to, or can lead to, a defect. Variability or Variation: A difference in process or result that may or may not be an error and may or may not lead to a defect. Because it arrives upside-down from the manufacturer? With more heat, the engine might catch fire. Jim traced the blankets back to the sub-contractor. From this, he confirmed what others had seen: There was nothing different at the oven, or visible in the car, that explained why a few cars caught fire, and most did not. Five times - is the easiest way to do it! What Root Cause Analysis Can Do Root cause analysis can solve the most mysterious and stickiest problems. The baking is done in a paint oven with infrared radiation, and takes about eight minutes. Because we did not know the details of our own process. But it only heated it up enough to cause a fire if some other difference was also present. A deeper look showed that, on top of the engine, there is a wiring harness, a bundle of electrical wires serving different features of the car. If it is not an error and does not lead to a defect, then it is acceptable variation. Engineering: The technical work of defining and measuring processes to create products. Quality Engineering: The technical work of preventing, eliminating, or reducing errors to an acceptable level so that the resulting products are either zero-defect, or have an acceptably low defect rate. Cause (of an error): A difference in process that leads to a significant difference, which leads to a defect. Why: What difference (in process) led to a significant difference (an error) that led to a defect? The Five Whys: A Method for Root Cause Analysis Root cause analysis begins by looking at a defect, that is, the failed result of a process.

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