

# Effective Problem Solving and Root Cause Identification

**Jason Digance, Airworthiness Surveyor**  
CAA AW Seminar Derby, 14<sup>th</sup> October 2019

## Effective Problem Solving and Root Cause Identification

CAP 1760



# Working with Industry



**BARNBROOK SYSTEMS**

**setting higher standards**  
Effective Problem Solving & Root Cause Identification  
Frank Dearie 14<sup>th</sup> October 2019  
RR Derby



**2EXCEL**

**The Investigation Road Map  
– How it has worked for us.**

Nick Clutton  
Deputy Safety Manager  
2Excel Aviation



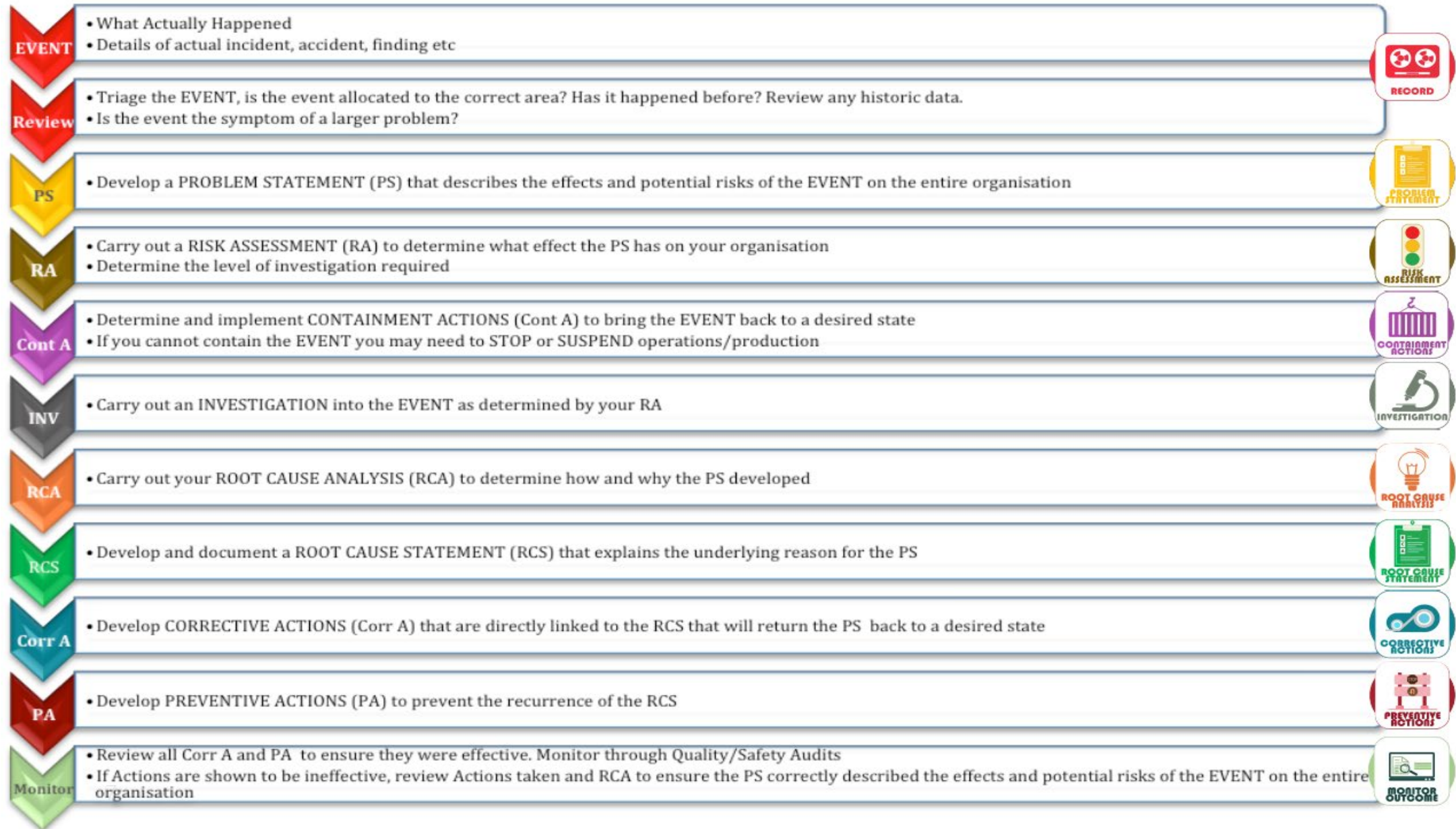
Our journey to improve problem solving across Civil Aerospace...the story so far

CAA Seminar - Effective Problem Solving & Root Cause Identification

Christine Brown, Head of Operations Quality  
Civil Aerospace, Rolls-Royce plc

14<sup>th</sup> October 2019





# Following the Process



**STAGE 1: Record the *event* in your MEMS, Quality System or SMS and if appropriate report it to the NAA**



**STAGE 2: Create the Problem Statement.**



**STAGE 3: Carry out a Risk Assessment (if required)**



**STAGE 4: Develop and Implement Containment Actions**



- Determine and implement CONTAINMENT ACTIONS (Cont A) to bring the EVENT back to a desired state
- If you cannot contain the EVENT you may need to STOP or SUSPEND operations/production



# Record the s'

## EVENT RECORD TABLE



**Event (What Happened)**



Phase	1) Initial event information	2) Subsequent investigation
When		
Where		
Who		
How		



**Problem Statement (Potential effects/risks)**

Risk Assessment	Initial Risk Score				Final Risk Score
	Investigation	Low	Medium	High	
Operation	Production	Review	Continue	STOP	
	Sales	Review	Continue	STOP	
	Operations	Review	Continue	STOP	



**Containment**

**Evidence**

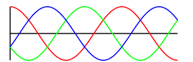
**Human Factors** Evidence: Conclusion:



**Root Cause Statement**



**Validation / timescale**





# Following the Process



STAGE 5: The Investigation Process



STAGE 6: Effective Root Cause Analysis



STAGE 7: Develop and Document a Root Cause Statement

RCS

- Develop and document a ROOT CAUSE STATEMENT (RCS) that explains the underlying reason for the PS





**Record the Event:**  
Record 'what actually happened', the details of the accident/incident/audit finding in the organisations database.

**Containment Actions:**  
Develop *containment actions* that bring the event back to a desired state. If containment of the event is not possible consider *suspending or stopping operations/production*.

**Root Cause Statement:**  
Develop a *root cause statement* that explains the underlying reason for the *problem statement*.

**Corrective Actions:**  
Develop *corrective actions* that directly link to the *root cause statement* that will return the *problem statement* back to a desired state.

**Monitor the Outcome:**  
To ensure the *root cause* of the *problem statement* is correctly identified and addressed to prevent similar events occurring within the organisation. Ensure all *corrective and preventive actions* are effective by monitoring subsequent performance

**Record the Outcome:**  
Use the recorded information from each step to update the database. Use key information to develop an organisational risk register. Ensure the reporter of the event is kept informed.

**Preventive Actions:**  
Develop *preventive actions* to prevent the possibility of a recurrence of the *root cause statement*.

**Root Cause Analysis:**  
Use the organisations chosen method(s) of *root cause analysis* to determine how and why the *problem statement* developed.

**Investigation:**  
Carry out an *investigation* into the event to the extent determined by the *risk assessment* process.

**Risk Assessment: (if required)**  
Carry out a *risk assessment* to determine the effect the *problem statement* has on the organisation. Determine the level of *investigation* required.

**Develop a Problem Statement:**  
Describe the effects and potential risks of the event on the entire organisation. Make sure the *problem statement* reflects the generic problem.

**Common Bypass:**  
Route taken by many organisations to enable event closure. This route bypasses the development of the *problem statement* often resulting in event recurrence as the extent of the problem has not been established.

**Organisations often close reports at this point!**  
Don't STOP here ..... the root cause has NOT been established.

A route map to effective problem solving and root cause identification



# Root

Root Cause Analysis Table		
Step 1	What was the problem expressed in terms of a subject and undesired state?	
Step 2	What was the direct cause of the problem expressed in the terms of a subject and state?	
Step 3	Produce a line of causal factors expressed in the terms of a subject and state.  Think of these causes as links of a chain	
Step 4	Determine who owns each causal factor?	A B C D E
Step 5	What causal factors can be directly influenced by the organisation.	A B C D
Step 6	Which of the causal factors would solve the underlying organisational problem.	



Problem Statement



**‘The Root Cause Myth’  
T.Finlow-Bates**

# Following the Process



STAGE 8: Determine and Document Corrective Actions



STAGE 9: Determine and Document Preventive Actions



STAGE 10: Monitor Outcome - Ensure Corrective and Preventive Actions are Effective

Monitor

- Review all Corr A and PA to ensure they were effective. Monitor through Quality/Safety Audits
- If Actions are shown to be ineffective, review Actions taken and RCA to ensure the PS correctly described the potential effects/risks of the EVENT on the organisation





**A route map to effective problem solving and root cause identification**



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# EVENT RECORD TABLE



**Event (What Happened)**

Phase	1) Initial event information	2) Subsequent investigation
When		
Where		
Who		
How		
<b>Problem Statement (Potential effects/risks)</b>		
<b>Risk Assessment</b>	Initial Risk Score	Final Risk Score
	Investigation    Low    Medium    High	
<b>Operation</b>	Production    Review    Continue    STOP Sales    Review    Continue    STOP Operations    Review    Continue    STOP	
<b>Containment</b>		
<b>Evidence</b>		
<b>Human Factors</b>	Evidence:	Conclusion:



**Root Cause Statement**



**Validation / timescale**

# EVENT CLOSURE TABLE



**Event (What Happened)**



**Problem Statement (Potential effects/risks)**



Containment Action(s)	Notes:	Stakeholder/ Action Owner	Due Date	Actioned	Additional detail:
1					
2					
3					



**Root Cause Statement**



Corrective Action(s)	Notes:	Stakeholder/ Action Owner	Due Date	Actioned	Additional detail:
1					
2					
3					
4					



Preventive Action(s)	Notes:	Stakeholder/ Action Owner	Due Date	Actioned	Additional detail:
1					
2					
3					



**Validation / timescale**











# Available Training

- CAAi have completed 2 open courses for industry and a bespoke course, with more to follow .....
- Perspective dates to be launched on CAAi website for 2020

## Effective Problem Solving and Root Cause Identification (Root Cause Analysis)

**25-26<sup>th</sup> March 2020**

**15-16<sup>th</sup> June 2020**

**28-29<sup>th</sup> September 2020**

