

Root Cause Analysis (RCA)

What is it?

A root cause is the basic physical phenomena that results in a product/process “failure”. Root cause analysis (RCA) is a systematic approach for identifying and eliminating a root cause. A failure “symptom” will reoccur if its root cause is not eliminated, even if that “obvious” symptom looks like it was corrected. Reliability growth can occur only if root failure causes are identified and removed.



Period over which analysis is performed (t):	1700		
Number of items (n) impacted by CA over period (t):	100		
Combined estimated # of failures over period based on $\frac{1}{n} \frac{DF}{FMTBF}$:	62	SW	FRUC
Combined estimated # of failures over period based on $\frac{1}{n} \frac{DF}{FMTBF}$:	38	8	26
		3	18
Number of Combined Failures Eliminated Due to FA & CA:	77	5	13
		4	

What’s the payoff?

A formal RCA process promotes reliability growth in products and processes. Up-front investment in strategic performance of RCA can result in significant savings in total life cycle cost. It can also promote a “lessons-learned” process for understanding failure relationships, causes, effects and solutions.

Costs Associated with Performing Root-Cause Failure Analysis and Corrective Action Implementation & Verification	
I. Cost of Root-Cause Failure Analysis	
A. Total Cost of Hardware Root-Cause Failure Analysis	\$3,370.00
A. Total Cost of Process Root-Cause Failure Analysis	\$1,000.00
A. Total Cost of Software Root-Cause Failure Analysis	\$10,920.00
IA. TOTAL COST OF ROOT-CAUSE FAILURE ANALYSIS - COMBINED	\$15,290.00
I. Cost of Corrective Action Implementation and Verification	
B. Total Cost of Hardware Corrective Action & Implementation	\$618.00
B. Total Cost of Process Corrective Action & Implementation	\$69,420.00
B. Total Cost of Software Corrective Action & Implementation	\$22,600.00
IB. TOTAL COST OF CORRECTIVE ACTION IMPLEMENTATION & VERIFICATION - COMBINED	\$92,638.00
I. Cost Benefit of Performing Root-Cause Failure Analysis and Corrective Action Implementation & Verification	
C. Total Benefit of Hardware Root-Cause Failure Analysis and Corrective Action & Implementation	\$23,076.00
C. Total Benefit of Process Root-Cause Failure Analysis and Corrective Action & Implementation	\$54,710.00
C. Total Benefit of Software Root-Cause Failure Analysis and Corrective Action & Implementation	\$13,200.00
IC. TOTAL COST BENEFIT OF ROOT-CAUSE FAILURE ANALYSIS & CORRECTIVE ACTION - COMBINED	\$90,986.00
COMBINED TOTAL SAVINGS BY PERFORMING ROOT-CAUSE FAILURE ANALYSIS AND CORRECTIVE ACTION IMPLEMENTATION	

How can we help?

- Perform analyses to determine when RCA should be cost-effectively performed and quantify the long-term cost savings that result.
- Perform or participate in RCA to determine the true root cause of failure, as opposed to a failure symptom
- Identify a candidate corrective action (or actions) to ensure that a root failure cause (and not just a symptom) has been eliminated or suitably mitigated
- Collect and analyze data to verify that a corrective action has successfully resolved a root failure cause
- Define and implement a closed-loop reporting system/ database that includes RCA and corrective action results