



Title:	Root Cause Analysis	SOP No:	ITS-RADIO-016
Revision:	1.1	Effective Date:	March 28, 2022
Owner:	Manager Wireless Communications	Department:	IT Solutions

## Root Cause Analysis

### 1 Purpose

Implement a root cause analysis methodology for problem solving that examines and solves the causes of system problems in order to prevent their recurrence and mitigate service impacting incidents on the public safety radio system that provides communications for first responders across much of North Central Texas. Root Cause analysis is applicable to the Chronic Issue Resolution protocol established in Radio-015.

The Wireless Communications Manager will be responsible for invoking the root cause analysis process defined in this policy.

### 2 Scope

This policy applies to internal agencies that communicate on Radio System network. External agencies will be informed of applicable root cause analysis processes that are service impacting and/or chronic issues.

### 3 References

- Radio 015: Chronic Issue Resolution

### 4 Conditions for Exemption

Exceptions to the policy must be approved by the Senior Manager over Wireless Communications.

### 5 Justification

The root cause analysis process will result in corrective and/or remedial action specifically directed to the cause of a system problem based on analysis and factual evidence. The end product of the root cause analysis method is successful permanent mitigation or compensative control management of the fault that caused the system problem and prevent its future occurrence.



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## 6 Root Cause Analysis Methodology

Root cause analysis is an investigative process and methodology. An overview of the root cause analysis process is illustrated in the Figure 1 below:

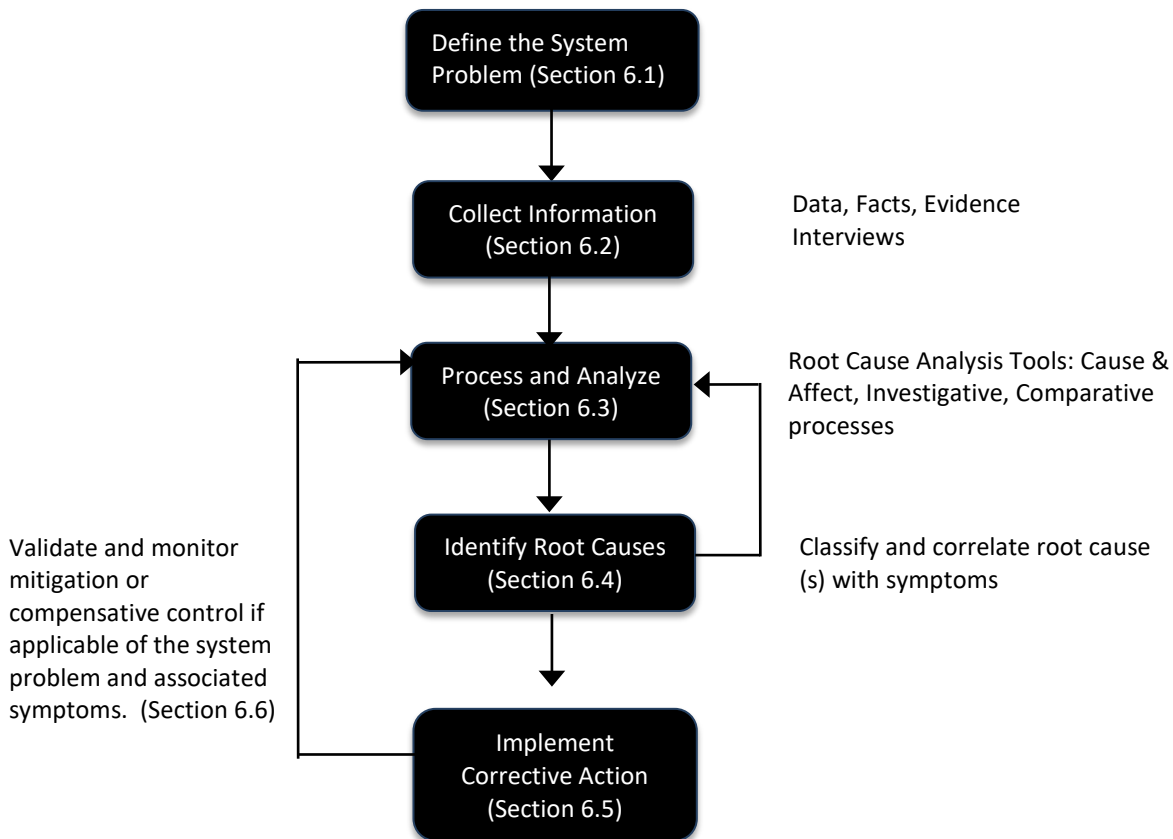


Figure 1: Root Cause Analysis Mapping

### 6.1 Define the System Problem

The system problem and/or chronic issue should be comprehensively defined including a description of the system problem and specific resulting outcome whether a failure, fault, system downtime or other. Additionally, all known and specific symptoms should be documented.



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## 6.2 Collect Information

Gather specific data, facts and evidence of the system problem including a timeline of events, known events and incidents and interviews with stakeholders with applicable. Implement data analysis tools, processes and procedures to gather all information necessary. The end product should be information that outlines all known information, incidents, the factors and circumstances surrounding the system problem.

## 6.3 Process and Analyze

Categorize and correlate all known information, factors, symptoms and relationships associated with the system problem and/or chronic issue. Evaluate significant causes rather than their effects.

Examples of tools that can be used to identify root causes are:

**Cause and Affect Analysis** that documents all possible and likely causes as well as their specific relationships to the system problem and its symptoms

Example:

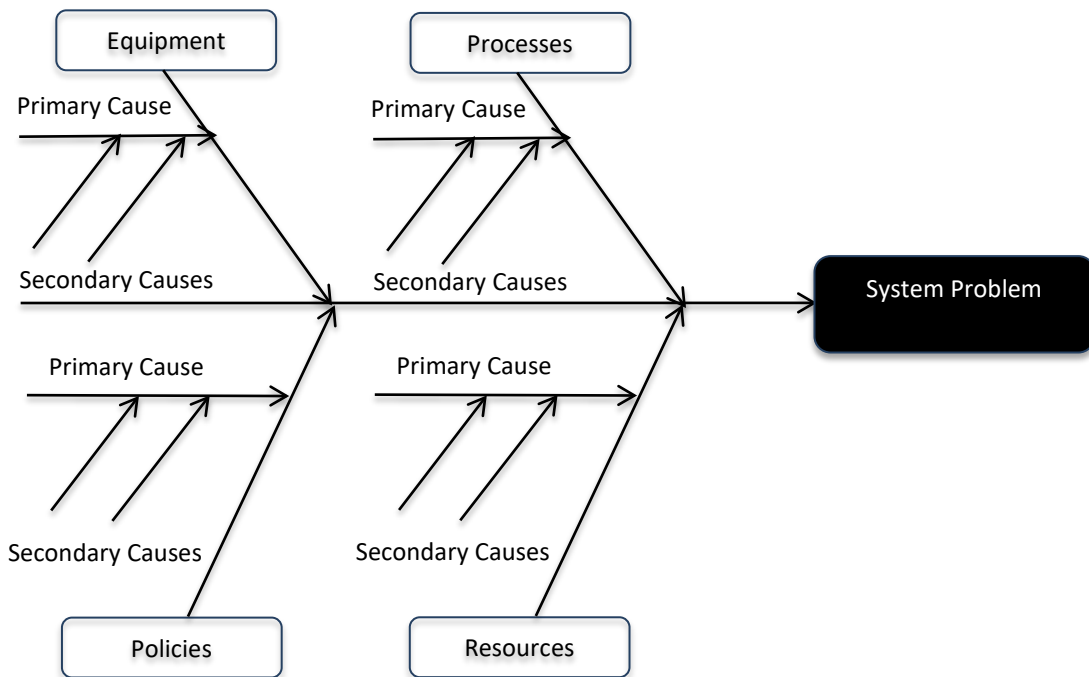


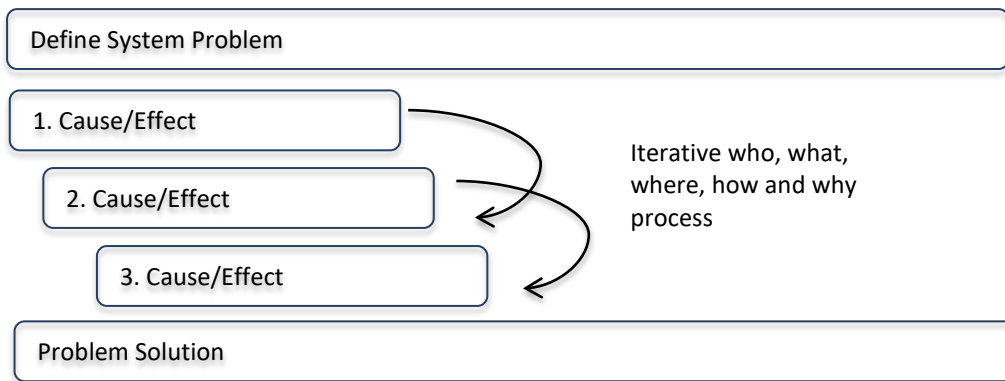
Figure 2: Cause and Affect Analysis Example



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**Investigative Iterative** process that defines the problem and drills into each specific symptom and its related causes by asking what, why, who and when questions

Example:



**Figure 3: Investigative Process Example**

**Comparative Analysis** method of comparing the current environment and state to what is expected in normal operating conditions

Example:

System Problem:

Properties	Observations:	Comparisons:	Differences:
Who			
What			
Where			
How			
When			

**Figure 4: Comparative Analysis Example**



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#### **6.4 Identify Root Causes**

Identify and classify all possible root causes directly associated with the known information uncovered as part of section 6.2. Ensure that all possible root causes are evaluated rather than their symptoms. There may be more than a single root cause for a system problem.

#### **6.5 Implement Corrective Solution**

Identify specific corrective and/or remedial actions that will prevent reoccurrence of each possible root cause documented in 6.3. Validate that these corrective and/or remedial actions would solve or provide compensative control if necessary of each harmful impact, outcome, symptom and system problem in 6.1.

#### **6.6 Monitor and Validate**

Ensure effectiveness of the corrective and/or remedial action by observation, documentation and monitoring to ensure successful long-term mitigation or compensative control if applicable.



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### ***Version Control***

<u>Version</u>	<u>Date</u>	<u>Description</u>	<u>Author</u>
1.0	8/1/2014	Original version	Abinta Khan
1.1	3/28/2022	Changed Radio Services to Wireless Communications, minor editing	Larry Crockett