



COURSE OVERVIEW PE0928 Root Cause Analysis - Fundamental (E-Learning Module)

Course Title

Root Cause Analysis - Fundamental
(E-Learning Module)

Course Reference

PE0928

Course Format & Compatibility

SCORM 1.2. Compatible with IE11, MS-Edge, Google Chrome, Windows, Linux, Unix, Android, IOS, iPadOS, macOS, iPhone, iPad & HarmonyOS (Huawei)

Course Duration

30 online contact hours
(3.0 CEUs/30 PDHs)



Course Description



This E-Learning is designed to provide participants with a detailed and up-to-date overview of root cause analysis fundamental. It covers the domino theory, layers and layers of latent causes and the philosophy of root cause analysis; the symptom approach versus root cause and verification of complaint; the fishbone diagram; the tools used in root cause analysis and brainstorming; the questions to ask when performing RCA; classifying events; determining incidents, accidents, harm to people, industrial fatality, occupational illness, property damage (accidental) and damage to the environment; and avoiding accidental discharge of hazardous waste, accident loss or discharge of radioactive materials and accidental release of toxic, flammable or explosive liquids or gases.

During this interactive course, participants will learn the estimation of events losses; the incident investigating team composition and duties; the five why's preparation including the seven cause and effect steps; the incident investigation, conducting investigation and the six-step process; the usage of root cause analysis to understand failures and incidents and recognize the types of incidents; the cause mapping method of root cause analysis; reading a cause map, gathering data and creating a timeline (sequence diagram); investigating causes of failures & incidents; and generating recommendations.



Course Objectives

At the end of this course, the Trainee will be able to:-

- Apply and gain a fundamental knowledge on root cause analysis
- Explain basic need of trouble shooting and root cause analysis methods
- Identify and describe techniques associated with root cause analysis
- Describe the concepts of many simple and practical hands on examples
- Identify and explain typical process and equipment problems (e.g. feed specifications, product quality and chemical dosage problems)
- Prepare log sheets, record problems, select the appropriate root cause analysis technique, identify causes and provide solutions
- Carryout root cause analysis and discuss the domino theory, layers and layers of latent causes and the philosophy of root cause analysis
- Differentiate symptom approach versus root cause, perform root cause analysis and verify the complaint
- Illustrate fishbone diagram, identify the tools used in root cause analysis and apply brainstorming
- List the questions to ask when performing RCA, classify events and determine incidents, accidents, harm to people, industrial fatality, occupational illness, property damage (accidental) and damage to the environment
- Avoid accidental discharge of hazardous waste, accident loss or discharge of radioactive materials and accidental release of toxic, flammable or explosive liquids or gases
- Estimate events losses, identify incident investigating team composition and duties as well as who should investigate and what to investigate?
- Explain the five why's preparation including the seven cause and effect steps
- Employ incident investigation, conducting investigation and the six-step process
- Use root cause analysis to understand failures and incidents and recognize the types of incidents
- Carryout cause mapping method of root cause analysis, read a cause map, gather data and create a timeline (sequence diagram)
- Investigate causes of failures & incidents and generate recommendations

Who Should Attend


This course provides an overview of all significant aspects and considerations of root cause analysis fundamental for senior process engineers, process engineers and other technical staff.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations: -

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USA International Association for Continuing Education and Training (IACET)

Haward Technology is an Authorized Training Provider by the International Association for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 1-2013 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 1-2013 Standard**.

Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Association for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

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British Accreditation Council (BAC)

Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

Course Fee

As per proposal

Training Methodology

This Trainee-centered course includes the following training methodologies:-

- Talking presentation Slides (ppt with audio)
- Simulation & Animation
- Exercises
- Videos
- Case Studies
- Gamification (learning through games)
- Quizzes, Pre-test & Post-test

Every section/module of the course ends up with a Quiz which must be passed by the trainee in order to move to the next section/module. A Post-test at the end of the course must be passed in order to get the online accredited certificate.

Course Contents

- Introduction
- Root Cause Analysis
- What is Root Cause?
- Go Deeper than Obvious
- The Domino Theory
- Layers and Layers of Latent Causes
- Philosophy of Root Cause Analysis
- We Perform Root Cause Analysis to Prevent Turnbacks and Customer Escapes from Recurring
- Symptom Approach vs. Root Cause
- How do we do Root Cause Analysis?
- Example: The Washing Machine
- Verify the Complaint
- Fishbone Diagram - A Useful Tool
- Investigate Why
- Root Cause of our Example?
- Case study #1
- Quiz #1
- Tools Used in Root Cause Analysis

- Brainstorming
- Fishbone Diagram
- Questions to Ask When Performing RCA
- Asking Why: Sometimes Simple, Sometimes Complex
- Case study #2
- Quiz #2
- Classification of Events
- Incidents
- Accidents
- Harm to People
- Industrial Fatality
- Lost Workday Case - LWDC
- Restricted Workday Case - RWDC
- Medical Treatment Case - MTC
- First Aid Case – FA
- Occupational Illness
- Property Damage (Accidental)
- Catastrophic
- Severe
- Critical
- Marginal
- Minor
- Damage to the Environment
- Classification of Events
- Damage to Flora & Fauna
- Oil Spills
- Algal Blooms
- Tainting or contamination of groundwater
- Accidental Discharge of Hazardous Waste
- Accident Loss or Discharge of Radioactive Materials
- Accidental release of Toxic, Flammable or Explosive Liquids or Gases
- The accidental release
- Near Misses

- Case study #3
- Quiz #3
- Costing of Accidents & Near Misses
- Introduction
- Purpose and Objectives
- Responsibilities
- Estimation of Events Losses
- Case study#4
- Quiz #4
- Incident Investigating Team Composition & Duties
- Who should Investigate?
- The Line Supervisors
- The Middle Managers
- Staff Personal
- What to Investigate?
- Loss Potential Matrix
- Case study #5
- Quiz #5
- The 5 Why's
- Five Why's Preparation
- Five Why's – The First Why
- Five Why's – The Second Why
- Five Why's – The Third Why
- Five Why's – The Fourth Why
- Five Why's – The Fifth Why
- Five Why's – Conclusion
- Case study #6
- Quiz #6
- Fish-bone Diagram (Ishikawa)
- Fish-bone Diagram
- Example: Fish-bone Diagram
- Questions to Ask When Performing RCA
- People

- Machine
- Measurements
- Material
- Environment
- Methods
- Fishbone Steps
- The Seven Cause and Effect Steps
- Case study #7
- Quiz #7
- Incident Investigation
- Conducting Investigation
- Defences
- The Six-Step Process
- Step 1: Secure the incident Scene
- Step 2: Collect Facts About what Happened
- Interviewing
- Cooperate, Don't Intimidate!
- What Should We Say and Do?
- Step 3: Develop the Sequence of Events
- Step 4: Determine the Causes
- The Domino Sequence
- Step 4: Determine the Causes
- Direct Cause of Injury
- Surface Causes of the Incident
- Steps in Cause Analysis
- Step 5: Recommend Corrective Actions & Improvements
- The Hierarchy of Controls
- Principles of Prevention
- Improvement Strategies to Fix the System
- System Improvements
- Permanent Actions
- Step 6: Write the Report
- Writing the Investigation Report



- Incident Report Form
- Case study #8
- Quiz #8
- Using Root Cause Analysis to Understand Failures & Incidents
- What's a Incident?
- Types of Incidents
- Purpose of Company Incident Investigation
- Investigating Causes of Failures & Incidents
- Definitions
- Root Cause Analysis
- Objective
- Definitions of RCA & Related Terms
- Company Incident Classification Levels
- Root Cause Analysis Basics
- The Cause Mapping Method of Root Cause Analysis
- What is a Cause Map?
- How to Read a Cause Map
- Why does the Cause Map read Left to Right?
- Whys on a Cause Map-5
- Root Cause Analysis – Steps
- Gather data
- Create a timeline (sequence diagram)
- Example: simple timeline
- Investigating Causes of Failures & Incidents
- Generating Recommendations
- What is Root Cause Analysis? (RCA)
- Where Did it Come From?
- Case study #9
- Quiz #9
- RCA Generalities
- RCA Goals
- Why Involve Residents in RCA?
- ACGME “Procedure Log”



- RCA Model
- When is an RCA Done?
- When is an RCA Done?
- A Decision Making Tool (SAC)
- Why is an RCA Important?
- Why Use a Particular Method?
- When not to do an RCA?
- How RCAs Work
- Key RCA Roles
- Overview of Steps
- Triage Cards
- RCA Team in Action
- RCA Role Play
- Case Summary
- Case study #10
- Quiz #10