

COURSE OVERVIEW HE0718-4D
Root Cause Analysis & Incident/Accident Investigation

Course Title

Root Cause Analysis & Incident/Accident Investigation

Course Date/Venue

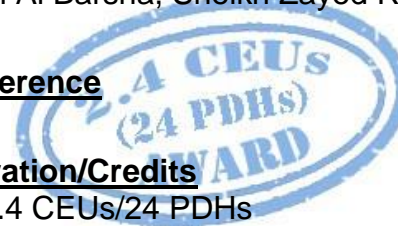
December 09-12, 2024/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE

Course Reference

HE0718-4D

Course Duration/Credits

Four days/2.4 CEUs/24 PDHs



Course Description



This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.



A high percentage of incidents are caused by human error and lack of proper training. The number of such incidents may be greatly reduced by thorough investigation of incidents, establishing root causes, implementing effective corrective and preventative actions. This course is designed to introduce the attendees to established methods, of achieving this in a structured and proven manner.



Root cause analysis is simply a tool designed to help investigators (1) describe WHAT happened during a particular occurrence, (2) determine HOW it happened and (3) understand WHY it happened. Only when investigators are able to determine WHY an event or failure occurred will they be able to specify workable corrective measures.

Most event analysis systems allow investigators to answer questions about what happened during an event and about how the event occurred, but often they are not encouraged to determine why the event occurred. Generally, mistakes do not “just happen”. They can be traced to some well-defined causes.

When the analysis stops at the point of answering WHAT and HOW, the recommendations for preventing recurrence of the event may be deficient. Investigations that probe more deeply into WHY the error occurred are able to provide more specific, concrete and effective recommendations.

The root cause analysis presented in this course is designed for use in investigating and categorizing the root causes of events with safety, health, environmental, quality, reliability and production impacts, although the exercises and case studies used in this course are predominantly those having safety and health impacts.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on root cause analysis and incident/accident investigation
- Identify the common causes of incidents and enumerate the different various types of accidents to investigate
- Determine the link between investigation and risk assessment and acquire knowledge on how to predict possible incidents using reactive and proactive methods
- Discuss the framework for incident investigation and analysis including the relationship between the accidents and incidents, link between reactive and proactive, management system failure and root causes for accidents
- Employ the root cause analysis (RCA) techniques and differentiate between cause tree analysis (CTA) and fault tree analysis (FTA)
- Implement the principal stages of an accident investigation on planning and how to counteract investigator bias and mindset
- Apply structured data collection including getting information, preparing incident report and statement from the incident scene
- Carryout investigating, interviewing, and story boarding using the systematic techniques for incident investigations
- Practice the proper incident investigation procedures, forms and documentations through practical exercises, application-based case studies and workshops designed to reflect and employ the root cause analysis (RTA)
- Perform incident investigation to establish root cause analysis for all operating parameters as well as prepare and issue a detailed reports and take corrective action
- Operate according to international oil company's standards and procedures to achieve a production target

Exclusive Smart Training Kit - H-STK®



Participants of this course will receive the exclusive “Haward Smart Training Kit” (H-STK®). The H-STK® consists of a comprehensive set of technical content which includes **electronic version** of the course materials, sample video clips of the instructor’s actual lectures & practical sessions during the course conveniently saved in a **Tablet PC**.

Who Should Attend

This course provides an overview of all significant aspect and considerations of root cause analysis and incident/accident investigation for those who are responsible for others in the workplace such as managers, engineers, supervisors, team leaders, foremen and junior production operation staff. Further, the course is suitable for all HSE, fire and safety staff.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

- 30% Lectures
- 20% Practical Workshops & Work Presentations
- 30% Hands-on Practical Exercises & Case Studies
- 20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Fee

US\$ 4,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:



Mr. Andrew Ladwig is a **Senior Process & Mechanical Engineer** with over **25 years** of extensive experience within the **Oil & Gas, Refinery, Petrochemical & Power** industries. His expertise widely covers in the areas of **Ammonia Manufacturing & Process Troubleshooting, Distillation Towers, Crude Oil Distillation, Fundamentals of Distillation** for Engineers, **Distillation Operation and Troubleshooting, Advanced Distillation Troubleshooting, Distillation Technology, Vacuum Distillation, Ammonia Storage & Loading Systems, Ammonia Plant Operation, Troubleshooting & Optimization, Ammonia Recovery, Ammonia Plant Safety, Hazard of Ammonia Handling, Storage & Shipping, Operational Excellence in Ammonia Plants, Fertilizer Storage Management (Ammonia & Urea), Fertilizer Manufacturing Process Technology, Sulphur Recovery, Phenol Recovery & Extraction, Wax Sweating & Blending, Petrochemical & Fertilizer Plants, Nitrogen Fertilizer Production, Petroleum Industry Process Engineering, Refining Process & Petroleum Products, Refinery Planning & Economics, Safe Refinery Operations, Hydrotreating & Hydro-processing, Separators in Oil & Gas Industry, Gas Testing & Energy Isolations, Gas Liquor Separation, Industrial Liquid Mixing, Wax Bleachers, Extractors, Fractionation, Operation & Control of Distillation, Process of Crude ATM & Vacuum Distillation Unit, Water Purification, Water Transport & Distribution, Steam & Electricity, Flame Arrestors, Coal Processing, Environmental Emission Control, R&D of Wax Blending, Wax Molding/Slabbing, Industrial Drying, Principles, Selection & Design, Certified Process Plant Operations, Control & Troubleshooting, Operator Responsibilities, Storage Tanks Operations & Measurements, Process Plant Troubleshooting & Engineering Problem Solving, Process Plant Performance, Efficiency & Optimization, Continuous Improvement & Benchmarking, Process Troubleshooting Techniques, Oil & Gas Operation/Introduction to Surface Facilities, Pressure Vessel Operation, Process Equipment Performance & Troubleshooting, Plant Startup & Shutdown, Startup & Shutdown the Plant While Handling Abnormal Conditions, Flare & Relief System, Process Gas Plant Start-up, Commissioning & Problem Solving, Process Liquid and Process Handling & Measuring Equipment. Further, he is also well-versed in **Compressors & Turbines Operation, Maintenance & Troubleshooting, Heat Exchanger Overhaul & Testing Techniques, Balancing of Rotating Machinery (BRM), Pipe Stress Analysis, Valves & Actuators Technology, Inspect & Maintain Safeguarding Vent & Relief System, Certified Inspectors for Vehicle & Equipment, Optimizing Equipment Maintenance & Replacement Decisions, Certified Maintenance Planner (CMP), Certified Planning and Scheduling Professional (AACE-PSP), Tank Design, Construction, Inspection & Maintenance, Material Cataloguing, Specifications, Handling & Storage, Steam Trap Design, Operation, Maintenance & Troubleshooting, Steam Trapping & Control, Column, Pump & Exchangers, Troubleshooting & Design, Rotating Equipment Operation & Troubleshooting, Control & ESD System, Detailed Engineering Drawings, Codes & Standards, Budget Preparation, Allocation & Cost Control, Root Cause Analysis (RCA), Production Optimization, Permit to Work (PTW), Project Engineering, Data Analysis, Process Hazard Analysis (PHA), HAZOP Study, Sampling & Analysis, Training Analysis, Job Analysis Techniques, Storage & Handling of Toxic Chemicals & Hazardous Materials, Hazardous Material Classification & Storage/Disposal, Dangerous Goods, Environmental Management System (EMS), Supply Chain, Purchasing, Procurement, Logistics Management & Transport & Warehousing & Inventory, Risk Monitoring Authorized Gas Tester (AGT), Confined Space Entry (CSE), Personal Protective Equipment (PPE), Fire & Gas, First Aid and Occupational Health & Safety.****

During his career life, Mr. Ladwig has gained his practical experience through his various significant positions and dedication as the **Mechanical Engineer, Project Engineer, Reliability & Maintenance Engineer, Maintenance Support Engineer, Process Engineer, HSE Supervisor, Warehouse Manager, Quality Manager, Business Analyst, Senior Process Controller, Process Controller, Safety Officer, Mechanical Technician, Senior Lecturer and Senior Consultant/Trainer** for various companies such as the Sasol Ltd., Sasol Wax, Sasol Synfuels, just to name a few.

Mr. Ladwig has a **Bachelor's degree in Chemical Engineering** and a **Diploma in Mechanical Engineering**. Further, he is a **Certified Instructor/Trainer**, a **Certified Internal Verifier/Assessor/Trainer** by the **Institute of Leadership & Management (ILM)** and has delivered various trainings, workshops, seminars, courses and conferences internationally.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations


Certificates are accredited by the following international accreditation organizations:-

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The International Accreditors for Continuing Education and Training (IACET - USA)

Haward Technology is an Authorized Training Provider by the International Accreditors 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 2018-1 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 2018-1 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 Accreditors 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 **2.4 CEUs** (Continuing Education Units) or **24 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 Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1: Monday, 09th of December 2024

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Incident Investigation What is Incident • What is Accident • Relationship between Accident & Incident • Incident Causation • Incident Investigation • Incident Reporting
0930 - 0945	Break
0945 – 1100	Common Causes of Incidents Causes & Consequences of Incidents HBTA • Direct and Indirect Causes of Incidents • Management Control • Local Workplace Conditions & Human Error
1100 – 1230	Types of Incidents to Investigate Near Miss • Damage • Minor Injury • Major Injury • Death
1230 – 1245	Break
1245– 1420	The Link between Investigation & Risk Assessment Introduction to Risk Assessment • Predicting Possible Incidents, Using Reactive and Proactive Methods • Practical Example – Assessing a Workplace Conditions and Human Error
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day One

Day 2: Tuesday , 10th of December 2024

0730 – 0930	Framework for Incident Investigation & Analysis Accident Investigation and the Blame Culture • The Relationship between “Accidents” and “Incidents” • Human Error and Contribution to Incidents • The Link Between Reactive and Pro-Active Risk Management • Framework for Accident Investigation and Analysis • Management Systems (Latent) Failure and Root Causes for Accidents
0930 – 0945	Break
0945 -1230	Root Cause Analysis Root Cause Map • Root Cause Analysis Procedure • Root Cause Identification • Cause Tree Analysis • Fact Finding Process • Implementation of Corrective & Preventive Actions • Direct and Indirect Causes of Incident • Near Miss • Damage • Minor & Major Injuries • Death • Consequences for Human & Organization
1230 - 1245	Break
1245 - 1315	Cause Tree Analysis Role of the “Organization” in Incident Causation & Effects • Reason’s Accident Causation Model • Human Error and Accident Causation

1315 - 1420	Fault Tree Analysis Principle Stages of an Accident Investigation • Planning the Investigation • How to Counteract Investigator Bias and Mindset
1420 - 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Two

Day 3: Wednesday, 11th of December 2024

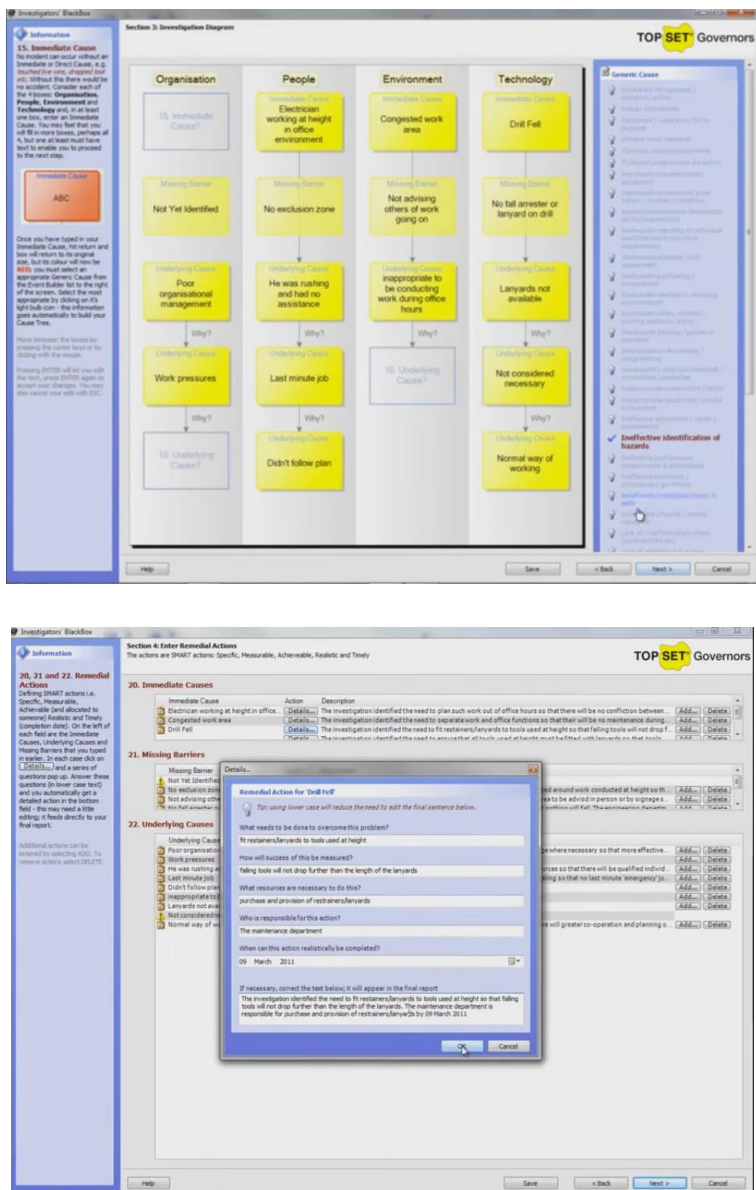
0730 – 0930	Events & Causal Factors Analysis
0930 – 0945	Break
0945 – 1100	Structured Data Collection Getting Information from the Incident Scene • Preparing Initial Incident Report • Preparing an Incident Statement
1100 – 1230	Investigating Planning and Investigating • Investigation Team • Relationship with External Agencies • Stages & Accident Investigation
1230– 1245	Break
1245 – 1420	Interviewing Techniques of Interviewing for Incident Investigations • Obtaining and Recording Information
1420 – 1430	Recap Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow
1430	Lunch & End of Day Three

Day 4: Thursday, 12th of December 2024

0730 – 0830	Storyboarding Plotting the Sequence of Events
0830 – 0930	Practical Exercise on Root Cause Analysis (Examples of Incidents & Workshop to Investigate a Sample) Formation of Investigation Teams • Setting the Scene – Video and Team Discussion • Question Session – Gathering of Information • Team Investigation – Analysis of Information
0930 – 0945	Break
0945 – 1230	Practical Exercise on Root Cause Analysis (Examples of Incidents & Workshop to Investigate a Sample) (cont'd) Team Discussion – Identification of Risk Control Measures • Producing a Basic Report, A Team Summary Report • Recommendations for Change – Creation of Action Plan
1230 – 1245	Break
1245 – 1345	Practical Exercise on Root Cause Analysis (Examples of Incidents & Workshop to Investigate a Sample) (cont'd) Corrective Actions • Preventive Actions • Implementation Stage
1345 – 1400	Course Conclusion Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course
1400 – 1415	POST-TEST
1415 – 1430	Presentation of Course Certificates
1430	Lunch & End of Course

Simulator (Hands-on Practical Sessions)

Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using our state-of-the-art BlackBox simulator.



Section 3: Investigation Diagram

Organisation	People	Environment	Technology
Immediate Cause?	Immediate Cause Electrician working at height in office environment	Immediate Cause Congested work area	Immediate Cause Drill Fall
Missing Barrier	Missing Barrier	Missing Barrier	Missing Barrier
Not Yet Identified	No exclusion zone	Not advising others of work going on	No fall arrestor or lanyard on drill
Underlying Cause Poor organisational management	Underlying Cause He was rushing and had no assistance	Underlying Cause Inappropriate to be conducting work during office hours	Underlying Cause Lanyards not available
Why?	Why?	Why?	Why?
Underlying Cause Work pressures	Underlying Cause Last minute job	Underlying Cause Underlying Cause?	Underlying Cause Not considered necessary
Why?	Why?	Why?	Why?
Underlying Cause?	Underlying Cause Didn't follow plan		Underlying Cause Normal way of working

Section 4: Enter Remedial Actions

Immediate Cause	Action	Description
Electrician working at height in office		The investigation identified the need to plan each work out of office hours so that there will be no confusion between...
Congested work area		The investigation identified the need to separate work and office functions so that there will be no maintenance during...
Drill Fall		The investigation identified the need to fit restrainers/lanyards to tools used at height so that falling tools will not drop...

Remedial Action for "Drill Fall"

Top using lower case will reduce the need to add the final sentence below.

What needs to be done to overcome this problem?

Restraints/lanyards to tools used at height

How will success of this be measured?

Falling tools will not drop further than the length of the lanyards

What resources are necessary to do this?

Purchase and provision of restrainers/lanyards

Who is responsible for this action?

The maintenance department

When can this action realistically be completed?

09 March 2011

If necessary, correct the text below; it will appear in the final report

The investigation identified the need to fit restrainers/lanyards to tools used at height so that falling tools will not drop further than the length of the lanyards. The maintenance department is responsible for purchase and provision of restrainers/lanyards by 09 March 2011.

BlackBox Software Tool

Course Coordinator

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