COURSE OVERVIEW HE0718-4D

Root Cause Analysis & Incident/Accident Investigation

Course Title

Root Cause Analysis & Incident/Accident Investigation

Course Date/Venue

Session 1: September 02-05, 2024/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Session 2: 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 pro-active, 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:-

- 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.

- 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

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

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

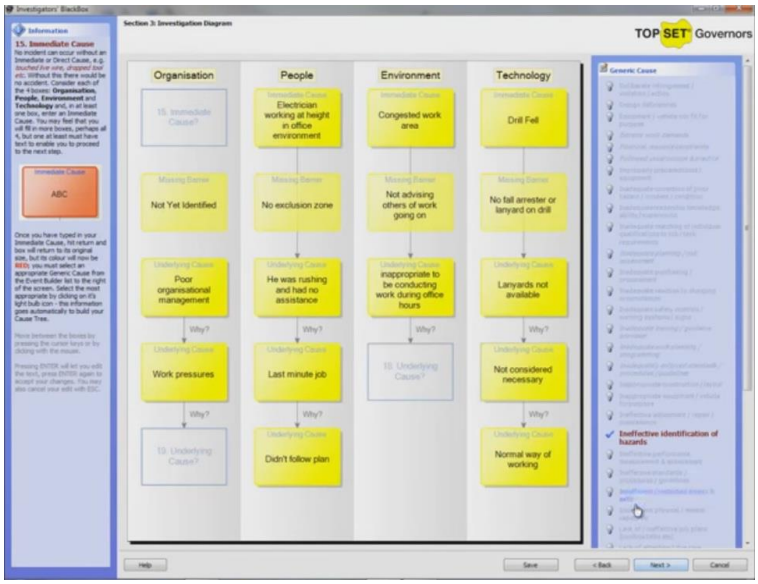
0730 – 0930	***Events & Causal Factors Analysis***
0930 – 0945	*Break*
0945 – 1100	***Structured Data Collection*** *Getting Information from the Incident Scene ● Preparing Initial Incident Report ● Preparing an Incident Statement*
1100 – 1230	***Investigating*** *Planning and Investigating ● Investigation 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*

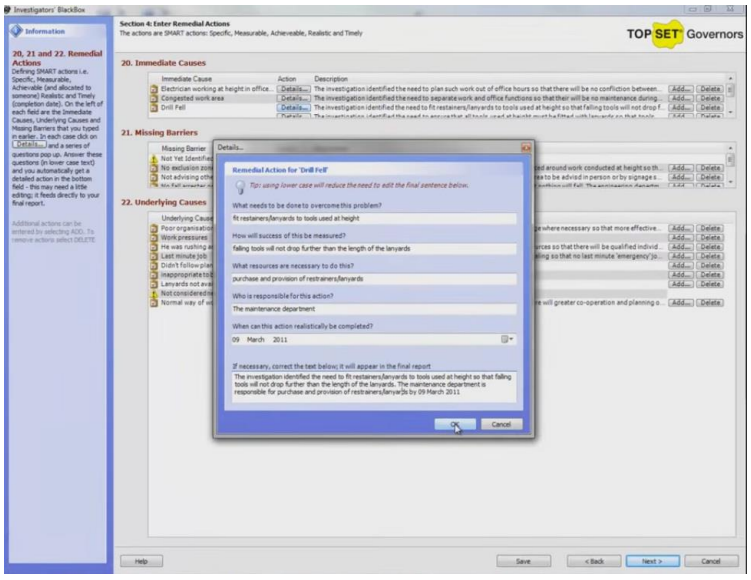
Day 4

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.





BlackBox Software Tool

Course Coordinator

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