COURSE OVERVIEW TM0769
Feasibility of Repair of Components from Plant Equipment

H-STK© INCLUDED

Course Title
Feasibility of Repair of Components from Plant Equipment

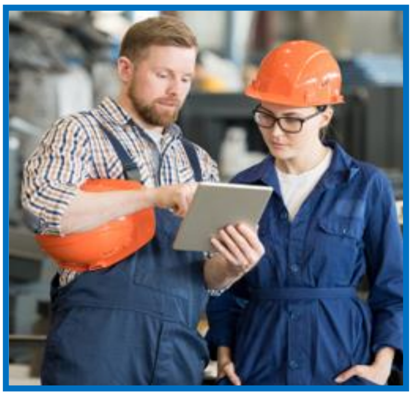
Course Date/Venue
Session 1: July 06-10, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: December 08-12, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

3.0 CEUs (30 PDHs) AWARD

Course Reference
TM0769

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description



This practical and highly-interactive course includes real-life case studies where participants will be engaged in a series of interactive small groups and class workshops.

This course is designed to provide participants with a detailed and up-to-date overview of Feasibility of Repair of Components from Plant Equipment. It covers the factors influencing repair feasibility and industry best practices for repair decision-making; the types of plant equipment and components for repair; the common causes of equipment failure; the inspection and failure analysis techniques, repair feasibility criteria and decision-making; the standards and best practices in repair feasibility; and the non-destructive testing (NDT) methods.

Further, the course will also discuss the material selection and evaluation for repairability; the welding and fabrication considerations in repairs; the mechanical and structural integrity assessment; the cost estimation and budgeting for equipment repair; the environmental and sustainability considerations in repair feasibility; the mechanical repair techniques for plant equipment including thermal spray coatings and surface treatment in repairs; and the welding and overlay repair techniques.

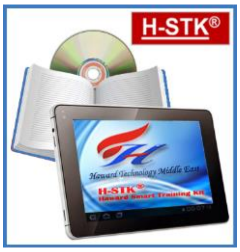
During this interactive course, participants will learn the composite repair technologies for structural components; additive manufacturing (3D printing) for equipment repair, repair planning and execution strategy; the qualification of welding procedures and personnel; the inspection and certification of repaired components; the risk assessment and reliability engineering in repairs, preventive maintenance and repair optimization; and the contractor selection, vendor management for repairs and digitalization and AI in repair feasibility analysis.

Course Objectives

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

- Apply and gain an in-depth knowledge on feasibility of repair of components from plant equipment
- Identify the factors influencing repair feasibility and industry best practices for repair decision-making
- Recognize the types of plant equipment and components for repair as well as the common causes of equipment failure
- Carryout inspection and failure analysis techniques and repair feasibility criteria and decision-making
- Review standards and best practices in repair feasibility and apply non-destructive testing (NDT) methods
- Employ material selection and evaluation for repairability including welding and fabrication considerations in repairs
- Apply mechanical and structural integrity assessment and cost estimation and budgeting for equipment repair
- Discuss environmental and sustainability considerations in repair feasibility
- Carryout mechanical repair techniques for plant equipment including thermal spray coatings and surface treatment in repairs
- Employ welding and overlay repair techniques as well as composite repair technologies for structural components
- Apply additive manufacturing (3D printing) for equipment repair, repair planning and execution strategy
- Recognize qualification of welding procedures and personnel including inspection and certification of repaired components
- Carryout risk assessment and reliability engineering in repairs, preventive maintenance and repair optimization
- Implement contractor selection, vendor management for repairs and digitalization and AI in repair feasibility analysis

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 conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of feasibility of repair of components from plant equipment for maintenance engineers, managers, reliability engineers, plant operators, mechanical engineers, technical managers, procurement officers, asset management teams, quality control, assurance professionals, external contractors, suppliers and safety manager.

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: -

- 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.

- 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 **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.

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. Geoff Kaschula Is a **Senior Inspection Engineer** with Over **30 Years** of Extensive Experience Within the **Oil**, **Gas**, **Petrochemical**, **Process** and **Power Industries**. His Fields of Specialization Cover the Areas of **Metallurgy, Metallurgical Failure Analysis & Prevention, Metallurgy and Welding Design**, **Fabrication**, **Construction**, **Installation**, **Commissioning**, **Inspection** & **Maintenance** of **Process Equipment** Such as **Boilers**, **Pressure Vessels**, **Piping Systems**, **Structures** & **Storage Tanks**; **Tank** Farm & **Tank** Terminal Safety & Integrity Management; Process **Piping** Design Fundamentals, **Piping** Integrity Management, **Condition Assessment** of Rotating & Auxiliary Equipment like **Compressors**, **Steam Turbines**, **Pumps**, **Heat Exchangers** & **Valves**; Risk Based Inspection (**RBI**), Fitness-For-Service (**FFS**), **Welding** & **Fabrication Engineering**, **Failure Analysis**, Flaw Evaluation, Remnant Life Determination, Capacity Reviews for Process and Power Equipment, Asset Management and Project Management. He Has also Worked Extensively with International Industry Standards Such as **ASME**, **API**, **TEMA**, **BS/EN**, **ANSI** & **AWS** To Name a Few. Mr. Kaschula is Currently the **Director** of **Rbi-Asset Management**.

Mr. Kaschula has handled wide-ranging responsibilities and assumed various important positions over the past 30 years in his career. Prior to founding his own company, he was the **Quality Manager** of **Parsons Brinckerhoff**, a power company, where he handled **design verification** of equipment such as boilers, pressure equipment, heat exchangers & pumps in addition to the overall development of management systems in compliance with **international safety**, **quality** and **technical standards**. He also worked as the **Inspection Manager** of **Weltech** where he was in charge of all major **inspection activities** and **plant condition evaluation** of **petrochemical plants** and **power stations**. He also worked extensively as a **Project Manager** for the design, fabrication and manufacturing of pressure vessels, heat exchangers and piping in accordance with **ASME** III & VIII standards. He also served as **Technical Assessor**, **Inspection Engineer**, **Welding Engineer** and **QA/QC Engineer** for companies like Arnot & Hendrina Power Station, Projects Expedited, Airtech Davidson & the Department of Transport. As the current **Director** of **RBI-Asset Management**, he oversees the overall operations of the company in providing technical and advisory services in the field of infrastructure asset management, design review, verification, inspection and condition assessment of major refinery equipment such as pressure vessels, storage tanks and piping systems.

Mr. Kaschula has a Master's degree in Corrosion Engineering. Further, he is a qualified **Welding Engineer** and a **certified API 510 Pressure Vessel Inspector**, **certified API 570 Piping Inspector**, **certified API 580 Risk Based Inspector**, a **Registered Inspector** & **Competent Person** for Boilers, Pressure Vessels & Pressure Equipment as well as a **Registered International Professional Welding Technologist** by the International Institute of Welding (**IIW**) and a **Certified Instructor/Trainer**.

Course Fee

US$ 5,500 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 Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the workshop 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	***Overview of Repair versus Replacement Decisions*** *Factors Influencing Repair Feasibility • Cost-Benefit Analysis of Repair versus Replacement • Life Cycle Cost of Repaired versus New Components • Industry Best Practices for Repair Decision-Making*
0930 – 0945	*Break*
0945 – 1030	***Types of Plant Equipment & Components for Repair*** *Pumps, Compressors, Turbines, & Valves • Heat Exchangers & Pressure Vessels • Piping & Structural Components • Rotating versus Static Equipment Repair Considerations*
1030 – 1130	***Common Causes of Equipment Failure*** *Wear & Tear Due to Operational Stress • Corrosion & Material Degradation • Fatigue & Mechanical Failure Modes • Failure Due to Improper Maintenance Practices*
1130 – 1230	***Inspection & Failure Analysis Techniques*** *Visual Inspection & Non-Destructive Testing (NDT) Methods • Metallurgical Analysis & Failure Modes Identification • Vibration Analysis & Condition Monitoring • Predictive Maintenance & Reliability-Centered Maintenance (RCM)*
1230 – 1245	*Break*
1245 – 1330	***Repair Feasibility Criteria & Decision-Making*** *Structural Integrity Assessment • Material Properties & Compatibility • Downtime & Operational Impact Considerations • Safety & Regulatory Compliance*
1330 – 1420	***Standards & Best Practices in Repair Feasibility*** *Guidelines for Repair Feasibility • Compliance with International Standards (API, ASME, ASTM) • Quality Assurance & Certification Requirements • Case Studies of Successful Repair Feasibility Assessments*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0830	***Non-Destructive Testing (NDT) Methods for Repair Feasibility*** *Ultrasonic Testing (UT) & Phased Array UT • Radiographic Testing (RT) & Digital RT • Magnetic Particle Inspection (MPI) & Dye Penetrant Testing (PT) • Eddy Current Testing (ECT) & Acoustic Emission (AE)*
0830 – 0930	***Material Selection & Evaluation for Repairability*** *Material Compatibility in Repaired Components • Hardness, Strength, & Toughness Considerations • Heat Treatment Effects on Repaired Materials • Case Studies on Material Failures & Repairs*
0930 – 0945	*Break*
0945 – 1100	***Welding & Fabrication Considerations in Repairs*** *Types of Welding Processes for Equipment Repair • Welding Defects & Their Impact on Repair Feasibility • Pre-Weld & Post-Weld Heat Treatment Requirements • API 510 & ASME IX Standards for Welding Repair*
1100 – 1230	***Mechanical & Structural Integrity Assessment*** *Finite Element Analysis (FEA) for Repair Decision-Making • Stress Analysis & Fatigue Life Estimation • Crack Propagation & Damage Tolerance Assessment • Load Distribution & Stress Concentration in Repaired Components*
1230 – 1245	*Break*
1245 – 1330	***Cost Estimation & Budgeting for Equipment Repair*** *Cost Estimation Techniques for Plant Equipment Repair • Factors Affecting Repair Cost Variation • Economic Justification Models for Repair versus Replacement • Cost Estimation Models for Repair Feasibility*
1330 – 1420	***Environmental & Sustainability Considerations in Repair Feasibility*** *Environmental Impact of Repair versus Replacement • Waste Reduction & Circular Economy Benefits • Sustainable Materials for Component Repair S• Sustainability Initiatives in Equipment Repair*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0830	***Mechanical Repair Techniques for Plant Equipment*** *Shaft Reconditioning & Alignment Techniques • Bearing & Seal Replacement • Fastener & Bolting Repair Best Practices • Case Studies of Mechanical Repairs in Plants*
0830 – 0930	***Thermal Spray Coatings & Surface Treatment in Repairs*** *Types of Thermal Spray Coatings (HVOF, Plasma Spray) • Corrosion-Resistant Coatings for Plant Equipment • Surface Preparation & Application Techniques • Case Studies on Coating Repairs for Plant Components*
0930 – 0945	*Break*
0945 – 1100	***Welding & Overlay Repair Techniques*** *Cladding & Overlay Welding for Corrosion Resistance • Repair Welding of Pressure Vessels & Piping • Cold Welding & Metallurgical Bonding Methods • Welding Repair Challenges & Solutions*
1100 – 1230	***Composite Repair Technologies for Structural Components*** *Fiber-Reinforced Polymer (FRP) Repair Applications • Adhesive Bonding & Mechanical Reinforcement Techniques • Composite Wrapping for Pipe & Tank Repairs • Performance Evaluation of Composite Repairs*

1230 – 1245	*Break*
1245 – 1330	***Additive Manufacturing (3D Printing) for Equipment Repair*** *Role of 3D Printing in Equipment Maintenance • Materials Used in Additive Manufacturing Repairs • Applications in Turbine Blade & Pump Component Repair • Future Potential of 3D-Printed Spare Parts*
1330 – 1420	***Case Studies of Successful Repairs in Petroleum Industry*** *Case Studies of Repaired Components • Comparison of Repair versus Replacement Outcomes • Lessons Learned from Past Repair Failures • Best Practices for Successful Repair Execution*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

0730 – 0830	***Repair Planning & Execution Strategy*** *Step-By-Step Planning Process for Major Repairs • Coordination Between Maintenance & Operations Teams • Safety Considerations During Repair Execution • Risk Assessment in Repair Planning*
0830 – 0930	***Repair Qualification & Certification Requirements*** *Qualification of Welding Procedures & Personnel • Inspection & Certification of Repaired Components • API & ASME Compliance for Repaired Equipment • Ensuring Traceability & Documentation*
0930 – 0945	*Break*
0945 – 1100	***Risk Assessment & Reliability Engineering in Repairs*** *Risk-Based Inspection (RBI) Approach • Reliability-Centered Maintenance (RCM) Principles • Failure Mode & Effects Analysis (FMEA) for Repair Decisions • Case Studies on Risk Assessment in Repair Feasibility*
1100 – 1230	***Preventive Maintenance & Repair Optimization*** *Proactive versus Reactive Maintenance Strategies • Predictive Maintenance Technologies (Vibration Analysis, Thermography) • Digital Twin Technology for Repair Planning • Case Studies on Optimized Maintenance Strategies*
1230 – 1245	*Break*
1245 – 1330	***Contractor Selection & Vendor Management for Repairs*** *Selecting Qualified Repair Contractors • Vendor Compliance with Company's Quality Standards • Performance Evaluation of Third-Party Repair Services • Contract Negotiation & Service Agreements*
1330 – 1420	***Digitalization & AI in Repair Feasibility Analysis*** *Use of Digital Twins for Repair Feasibility Studies • AI-Driven Predictive Analytics for Failure Detection • Augmented Reality (AR) for On-Site Repair Guidance • Future Trends in AI-Assisted Maintenance Planning*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today & Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Equipment Inspection & NDT Testing*** *Conducting Visual Inspections & Defect Identification • Hands-On Practice with Ultrasonic & Eddy Current Testing • Performing Magnetic Particle & Dye Penetrant Testing • Real-World Application in Plant Components*
0930 – 0945	*Break*
0945 – 1100	***Welding Repair Demonstration*** *Demonstration of Various Welding Repair Techniques • Hands-On Practice with Overlay & Cladding Repairs • Evaluating Weld Quality & Performing Post-Weld Inspections • Common Welding Defects & Corrective Actions*
1100 – 1230	***Composite Repair Application*** *Step-By-Step Composite Wrap Installation • Bonding & Curing Process for Composite Repairs • Load Testing & Performance Verification • Case Study on A Successful Composite Repair Project*
1230 – 1245	*Break*
1245 – 1345	***Equipment Repair Case Study Analysis*** *Reviewing Case Studies of Repaired Components • Analyzing Failure Modes & Repair Solutions • Group Discussions on Repair Feasibility Outcomes • Lessons Learned from Industry Best Practices*
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*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-

Course Coordinator

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