ABI5010 – Certificate in Hazard and Operability (HAZOP) / Hazard Identification (HAZID) Studies (HAZOP/HAZIDCert)©

This course is a dual certification course focusing on Hazard and Operability (HAZOP) study and Hazard Identification (HAZID) as well known and well documented methods. In the first part of the course, participants will be acquainted with HAZOP study used to verify the integrity of design or procedures with respect to safety and operability. HAZOP, or Hazard and Operability Studies is one of several risk assessment techniques used to demonstrate compliance with health, safety and environmental standards and legislation

PRE-REQUISITE: None

DURATION: 1Week

TARGET AUDIENCE

- Safety/environment Professionals
- Regulatory /Enforcement Officers
- Compliance officers
- Engineers (design & process Engineers)
- Facilities, instrumentation & control Engineers
- Operations and safety of process operators
- Production and facilities managers
- Plant operators, Maintenance Personnel

UNIT HH1: HAZARD OPERABILITY (HAZOP) STUDIES

Element1. Fundamentals of HAZOP

- Introduction to HAZOP

- Significance of HAZOP

- HAZOP Management

- Planning for HAZOP Study

- Team Characteristics and Questioning Techniques

- Composition of a HAZOP team and Responsibilities

- HAZOP meeting

- HAZOP procedure

- Duration of HAZOP

- Precautions during HAZOP

- Examples of HAZOP

Computer usage in HAZOP

- Limitations of HAZOP

- Alternatives to HAZOP

- Auditing HAZOP

Element 2. HAZOP Methods

- HAZOP Inherent Assumptions

- HAZOP Review Applications

- Ideal HAZOP Review Reference Data

- Credible Scenarios or Causes

- non-Credible Scenarios or Causes

- HAZOP Technical Suggestions

- HAZOP Review Suggestions

- HAZOP Recommendations and reporting

- Administrative Controls

- Engineering Controls

Element 3 HAZOP Approaches

- Approaches of Assigning Protection layers

- Performance Based Approach

- Prescriptive Approach

- Limitation of HAZOP/optimization of HAZAN

- HAZOP case study

UNIT HH2: HAZARD IDENTIFICATION (HAZID) STUDIES

Element 2.1. HAZID Principles

- Hazard Management Process
- Factors Increases the Hazards Potential for Process Industries
- Risk Concept
- Consequences Analysis
- Voluntary & Involuntary Risk
- Tolerable Risk in the industries
- Evaluating the Risk
- ALARP

Element 2.2. Hazard Evaluations

- Risk Matrices
- Evaluating the Frequency
  Evaluating the Severity
- Evaluating the Overall Risk
- Principals of Protective Measures
- Risk reduction
- Protection Layers
- Prevention Layers
- Mitigation Layers
- Initiating event
- Process Deviation
- Loss of Containment or Release of Energy
- Undesirable Events
- Process Controls Vs Safety Controls
- Separation of Process Control system and Safety Control System

Element 3: Hazard Analysis (HAZAN)

- Risk Criteria
- Estimating Likelihood
- Failure Modes
- Safe Failures
- Dangerous Failures
- Detected/Undetected Failures
- Random failures
- Common Cause Systematic failures
- Hazard Rate
- Probability of Failure on Demand (PFD)

- Safety Instrumented System (SIS)
- Role of (SIS)

Element 4: Safety Integrity Level (SIL) and Layer of Protection Analysis (LOPA)

- Safety Integrity Requirement
- Safety Integrity Leve l (SIL)
- Determining Safety Integrity Level (SIL)
- Risk Reduction and Reliability Assessment
- Reliability Analysis
- Voting And Redundancy
- Diversifications and Risk Graph
- Layer of Protection Analysis (LOPA)
- (LOPA)Procedure
- Independent Protection Layers (IPLs)
- Fault Tree Analysis (FTA)
- Failure Mode and Effects Analysis (FMEA)
- Events and Gates

UNIT HH3: Students will submit an individual evidenced based HAZOP/HAZID report that includes research and contain at least 1000 words. It will be based on a practical assessment and include research it must be work related. Once the project is complete it must be forwarded to ABIOSH within 21 days of the last exam. This practical must include a cover sheet stating that it is the students own work and signed by the instructor

EXAM STRUCTURE

Confirmation test either written exam or project to confirm knowledge and competence

Unit HH1 and HH2 – Providers can select examination or e portfolio

Unit HH3 – Individual project work to be submitted not later than 3 weeks after the written exams

1. HH1: HAZOP

No of Questions- 8
Total marks Available- 100
Time Allowed- 2 Hours
Pass Mark- 45%

2. HH2: HAZID

No of Questions- 8
Total marks Available- 100
Time Allowed- 2 Hours
Pass Mark- 45%

3. HH3: PRACTICAL

No of Questions- Maximum 40 Pages
Total marks Available- 100
Time Allowed- 3 weeks from date of Exams
Pass Mark- 50%

STUDENT TOTAL RESULT CALCULATIONS

HH1 + HH2 + HH3

- (LOPA)Procedure
- Independent Protection Layers (IPLs)
- Fault Tree Analysis (FTA)
- Failure Mode and Effects Analysis (FMEA)
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