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## **Human Factor and Human Error for Control Room Operations in Plant Safety**

### **Overview**

Human Supervisory control of automated plant play a significant role in contributing to many plant accidents in complex and high technology system such as Chernobyl, Three miles Island, Piper Alpha, and many more. Understanding and preventing human error in supervisory control of automated systems in plant process can reduce safety risks in plant process and improve plant safety. The interactive and comprehensive training workshop provides key principles and concepts of human supervisory control in plant process as well as human factor and human error perspective approach to human supervisory control tasks applied in plant operations that aims to prevent human error in control room and ultimately to improve plant safety. The 2 days training workshop provide a comprehensive set of practices, tools and techniques required to prevent and reduce human errors that occurred in control room operations. This hand-on practical training workshop is intentionally designed for those who responsible for or concerned with the control room operations that aims to prevent operational error, increase safety level, and reduce risks in plant process. This training workshop is targeted at various industries, not a specific one.

### **Objectives**

The 2 days interactive training workshop will enable you to learn how to

- Understand a key concept of human supervisory control of automated systems in your plant operations
- Understand human performance and limitations in human supervisory control of plant process
- Apply human factor and human error concept approach to human supervisory control tasks in plant process
- Identify the key contributing factors to human error in supervisory control
- Build an effective human factor inspections checklists applied for improving human supervisory control performance and reduce errors

### **Course Outlines**

#### 1. Human Supervisory Control of Automated Systems in Plant Process

Basic concept of Human Supervisory

Human Performance in Supervisory Control Tasks


- Perception
- Attention and Vigilance
- Memory
- Decision Making
- Response Execution

#### 2. Human Error in Supervisory Control

- Skill-based, Rule-based and Knowledge-based Errors
- Skill-based Slips and Lapse, Mistakes and Violations
- Cognitive Errors (Perceptual Error, Memory Errors, Decision making Error and Response Execution Errors)

#### 3. Human Performance and Limitations in Supervisory Control

- Physical Conditions (Visual and Hearing)
- Physiology Conditions
  - Fatigue
  - Stress
  - Fitness and Health
  - Drug and Alcohol
  - Circadian Rhythms
- Psychological Conditions
  - Attention

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- Vigilance and Workload
  - Preoccupation
  - Distraction and Cognitive Tunneling
4. Human Performance and Automations
  5. Safety Cases in Human Supervisory Control in Plant Accidents
  6. Situation Awareness in Control Room Operations
    - The Concepts of Situation Awareness (SA) and How is important for complex decision making in process control operations
    - Factors cause Loss of Situation Awareness in Control Room
    - Situation Awareness (SA) and SCADA
    - Situation Awareness Errors in SCADA (Safety Cases)
    - Situation awareness Improvement
  7. key contributing factors to human error in Supervisory Control
    - Personnel Factors
    - Human-Machine Interface(HMI)
      - Information Display
      - Human-Machine Interface
      - Control Systems
      - Alarm Systems
    - Communication
    - Procedures
    - Control Room Environment
    - Teamwork
    - Supervision
    - Tools and Equipments
  8. Human factor inspections Checklists in Supervisory Control
  9. Hand-on exercises
  10. Practical Case Study

### **Who should attend**


Management executive, supervisor, safety engineer, risk manager, and all participants who are responsible for or concerned with the management and control of risks, loss and damaged in complex and hazardous technology

### **Duration**

2 days

### **Key Points about This Course**

- You will learn how to understand the concept of human supervisory control of automated systems in plant process.
- You will learn how to understand and apply human factor and human error principles and concepts applied for human supervisory control of automated systems.
- You will learn how to understand and apply the concept of situation awareness (SA) in control room operations to prevent human supervisory control errors and improve plant safety.
- You will learn how to identify key contributing factors to human supervisory control error and how to improve it.
- You will learn how to develop a human factor inspections checklists applied for improving human supervisory control performance in plant process.

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### **Learning Outcomes from this course**

- You can understand a key concept of human supervisory control of automated systems in your plant operations
- You can understand human performance and limitations in human supervisory control of plant process
- You can apply human factor and human error concept approach to human supervisory control tasks in plant process
- You can identify the key contributing factors to human error in supervisory control
- You can build an effective human factor inspections checklists applied for improving human supervisory control performance and reduce errors