

## **CH759VTL - HAZOP Studies/Advanced PHA Concepts Combo Course – Virtual**

### **Day One (CH157)**

**10:15 – 10:30**

Log into WebEx training center to test connections

**10:30 – 10:45**

Welcoming remarks

**10:45 – 1:00**

- Hazard identification
- Incident scenarios, incident sequence

**1:00 – 1:30**

Lunch break

**1:30 – 4:00**

- Inherent safety
- Codes, standards, practices
- Layers of protection; preventive and mitigative safeguards
- Event Tree Analysis
- Day One review

### **Day Two (CH157)**

**10:15 – 10:30**

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**10:30 – 10:45**

Welcoming remarks

**10:45 – 1:00**

- Hazard and Operability Studies
- Scenario development using the Guide Word approach

**1:00 – 1:30**

Lunch break

**1:30 – 4:00**

- HAZOP scenarios workshop exercise
- Parameter-based approach
- Other HAZOP variations

## **Day Three (CH157)**

**10:15 – 10:30**

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**10:30 – 10:45**

Welcoming remarks

**10:45 – 1:00**

- Process risk concepts and calculations
- Risk matrices and risk magnitudes
- Determining the adequacy of safeguards
- Developing findings and recommendations

**1:00 – 1:30**

Lunch break

**1:30 – 4:00**

- PHA facilitation principles
- Addressing previous incidents, facility siting, human factors
- Documenting identified hazards

## **Day Four (CH157)**

**10:15 – 10:30**

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**10:30 – 10:45**

Welcoming remarks

**10:45 – 1:00**

- Checklist Analysis
- What-If Analysis; workshop exercise
- What-If/Checklist

**1:00 – 1:30**

Lunch break

**1:30 – 4:00**

- Failure Modes and Effects Analysis; workshop exercise
- Fault Tree Analysis
- Choosing the most appropriate PHA method

## **Day Five (CH157)**

**10:45 – 11:00**

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**11:00 – 11:15**

Welcoming remarks

**11:15 – 1:00**

- PHAs of procedure-based operations
- Procedure-based What-If and HAZOPs
- Procedure-based workshop exercise
- Programmable control considerations

**1:00 – 1:30**

Lunch break

**1:30 – 3:30**

- Updating/revalidating PHAs
- Report preparation
- Final Q&A session; comprehension check; course wrap-up

## **Day Six (CH754)**

**10:45 – 11:00**

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**11:00 – 11:15**

Welcoming remarks

**11:15 – 1:00**

- Bow Tie Analysis with worked example

**1:00 – 1:30**

Lunch break

**1:30 – 3:30**

- Layer of Protection Analysis (LOPA)

## **Day Seven (CH754)**

**10:45 – 11:00**

Log into WebEx training center to test connections

**11:00 – 11:15**

Welcoming remarks

**11:15 – 1:00**

- Layer of Protection Analysis (LOPA), continued

**1:00 – 1:30**

Lunch break

**1:30 – 3:30**

- LOPA worked examples
- HAZOP/LOPA

## **Day Eight (CH754)**

**10:45 – 11:00**

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**11:00 – 11:15**

Welcoming remarks

**11:15 – 1:00**

- Order-of-Magnitude HAZOP Study worked example

**1:00 – 1:30**

Lunch break

**1:30 – 3:30**

- Importance measures and Cumulative Risk/Benefit Analysis
- Safety Integrity Level (SIL) determination

## **Day Nine (CH754)**

**10:45 – 11:00**

Log into WebEx training center to test connections

**11:00 – 11:15**

Welcoming remarks

**11:15 – 1:00**

- Evaluating chemical reactivity hazards in PHAs

**1:00 – 1:30**

Lunch break

**1:30 – 3:30**

- Tools for assessing PHA scenario impacts
- Final Q&A session; comprehension check; course wrap-up