Risk Based Inspection (RBI)

Overview

**LEVEL**
Knowledge

**PURPOSE**
This course covers the necessary background for setting up RBI for static equipment.

**LEARNING OBJECTIVES**
Upon completion of the course, the participants will be able to:
- identify the degradation mechanism for a corrosion loop,
- describe the RBI methodology for a petrochemical or chemical plant,
- determine the probability and consequence of a failure,
- set up a suitable inspection plan.

**WAYS AND MEANS**
An interactive course based on actual case studies.

**LEARNING ASSESSMENT**
Final quiz.

**PREREQUISITES**
Basic knowledge of petrochemical and refineries process.

**Agenda**

**FUNDAMENTALS OF RISK BASED INSPECTION**
- API 580 overview, concept, probability and consequence of failure, risk ranking.
- API 580 methodology, benefits and limits, workforce and schedule necessary to perform RBI study.
- API 581 scope, probability of failure based on management factor and statistical failure frequency.

**QUANTITATIVE & SEMI-QUANTITATIVE RISK BASED INSPECTION APPROACH**
- Corrosion loops based on process conditions.
- Design data and inspection data identification.
- Damage factors identification based on corrosion standards such as API 571.
- Calculate probability of failure based on damage factor - Quantitative approach using API581 workflow.
- Calculate consequence of failure - Quantitative and semi-quantitative approach using API581 workflow.
- Evaluate the overall risk on API matrix.
- Define inspection strategy: mitigations actions or inspection scheduling extension.
- Overview of available commercial software “RBEYE”.
- Example of industrial RBI strategy implemented.
- RBI semi quantitative approach based on simplified Excel spreadsheet.

**APPLICATION OF THE RBI METHOD WITH MINI-PROJECTS CASE STUDIES**
- Application of API 581 RBI method using mini projects - Case studies as teamwork:
Select the appropriate corrosion loops and pressure vessels.
Identify the degradation.
Apply API 581 workflow to define POF, COF and overall risk.
Analyze the risk and propose: risk mitigation with more efficient NDT, adapt the inspection frequency.
Apply RBI semi quantitative approach based on simplified excel spreadsheet and compare the 2 methods.
Each group presents its RBI analysis and conclusion.