



# Ithuta JV

Holhutha Ka Tsebo  
Learning from Experience

## Course Content: Corrosion Risk Management

### 1. Introduction and Overview

- 1.1. Corrosion and Corrosion Protection as Systems
  - 1.1.1. Systems Features of Operational Facilities
  - 1.1.2. Overview of Corrosion Protection Systems
  - 1.1.3. Corrosion Protection and Operational Efficiency

### 2. Fundamental Principles

- 2.1. Corrosion
  - 2.1.1. Definition of Corrosion
  - 2.1.2. Electrochemical Corrosion
  - 2.1.3. Metallic Corrosion
  - 2.1.4. Corrosion of Non-metals
  - 2.1.5. Corrosive Environments
  - 2.1.6. Methods of Corrosion Protection
  - 2.1.7. Economic Considerations of Corrosion Protection
- 2.2. Risk Assessment and Management
  - 2.2.1. Purpose of Risk Assessment
  - 2.2.2. Risk Assessment Processes
  - 2.2.3. Risk Mitigation
  - 2.2.4. Risk Management
  - 2.2.5. Implementation of Risk Management
  - 2.2.6. Risk Management Plans
  - 2.2.7. Economic Appraisal of Risk Management

### 3. Corrosion Risk Management

- 3.1. Systems Analysis of Corrosion Systems
  - 3.1.1. Systems Under Protection
  - 3.1.2. Corrosion Protection Systems
- 3.2. Corrosion Risk Identification and Evaluation
  - 3.2.1. Inherent Risks in Corrosion Protection Systems
    - 3.2.1.1. Materials and Design
    - 3.2.1.2. Protective Coatings
    - 3.2.1.3. Corrosion Inhibitors and Electrochemical Methods
    - 3.2.1.4. Supply Chains
  - 3.2.2. Failures of Corrosion Protection Systems
    - 3.2.2.1. Risks of Failures of Corrosion Protection Systems
    - 3.2.2.2. Determining the Probability of Corrosion Protection System Failures
    - 3.2.2.3. Estimating the Impact of Failure
    - 3.2.2.4. Corrosion Risk Prioritisation
  - 3.2.3. Management and Control of Corrosion Risks
    - 3.2.3.1. Corrosion Risk Management and Control Plan



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3.2.3.2. Corrosion-based Design Approach

3.2.3.3. Quality Assurance

3.3. The Role of Value Management

3.3.1. Definitions of Value Management

3.3.2. Value and Cost

3.3.3. Defining Function and Performance

3.3.4. The Value of a Corrosion Protection System

3.3.5. Combining VM and Corrosion Risk Management

## 4. Case Studies

4.1. Minimising Corrosion Risks of Deep Level Mine Shafts

4.2. Minimising Corrosion Risks of Hot Sulphurous Gas Systems

## 5. Workshop