- 2026 -
ECE PROGRAM

TFC TECHNICAL SKILLS FOR SUCCESS

A foundational guide to the principles and practices of the oil and gas industry.

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MODULES - NOTES

1 Introduction

- intro to midstream sector
- IMP/PDCA
- regulatory bodies
  - add a facilities slide

2 Data, threats & risk

- types of data
- threats to pipelines
- risk

3 Corrosion

- types of corrosion
- ways to prevent corrosion

4 Operations

- operation of a pipeline

5 Inspection & Maintenance, Part 1

- types of inspections
- inspection technology
- pipeline maintenance

6 Inspection & Maintenance, Part 2

- repair criteria
- repair types

7 7) Facilities, Part 1

8 8) Facilities, Part 2

Module 1: Introduction to the Midstream Industry

Overview

- Brief overview of the oil and gas industry

Midstream Industry

- More detailed overview of midstream sector
- Regulatory bodies
- Difference between standards and regulations

Integrity

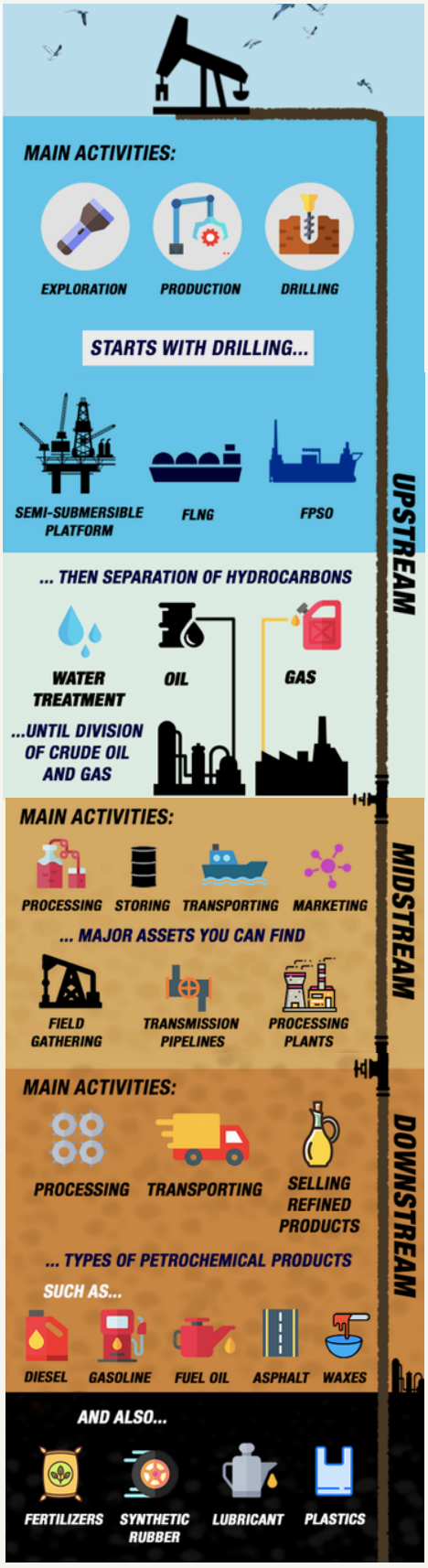
- Integrity management program (IMP)
- Plan-Do-Check-Act (PDCA)

Discussion

- Q&A

OVERVIEW OF O&G INDUSTRY

O&G Industry Sectors



Upstream

Midstream

Downstream

MIDSTREAM INDUSTRY

Regulation vs Standard

What is the difference between a regulation and a standard?

Useful Links

Federal Regulations

- US Natural Gas: Title 49 CFR 192 link
- US Hazardous Liquids: Title 49 CFR 195 link
- Canadian Oil & Gas Pipeline Systems Z662 link

Industry Standards

- API link
- ASME link
- NACE/AMPP link

Organizations

- PHMSA link
- NPMS link
- TRRC link
- LDNR link
- INGAA link
- SGA link

●●● Additional notes

INTEGRITY

Definition of IMP

a set of _____, _____, _____, _____, and _____ processes that are implemented in an integrated and rigorous manner to ensure operators provide enhanced protection for high consequence areas.

Types of Plans

1) _____
2) _____
3) _____
4) _____
5) _____

IM Plan

- Written plan of how to apply the process to manage integrity of assets
- Execution of each step in supporting the analysis and inspections
- Prevent, detect, and mitigate threats
- Prioritize critical segments using risk-informed processes and data
- Updated periodically

Performance Plan

- Evaluate the success of integrity assessment techniques, repairs, mitigative activities
- Consider new technology

Communications Plan

- Written plan explaining effective communications with employees, public, and authorities

MOC Plan

- MOC = _____
- Systematic process to implement changes and ensure new considerations are incorporated

QC Plan

- QC = _____
- Establish document control and retention policies as well as program evaluation

●●● Additional notes

DISCUSSION

Q&A

Q:

A:

Q:

A:

Q:

A:

Module 2: Data, Threats & Risk

Data

- Types of data
- Categorization of data

Threats

- Threats to pipelines

Risk

- Risk equation
- Risk models

Discussion

- Q&A

DATA

Types of Data

for integrity management (API 1160 Section 7.3)

1) _____

- Pipe and system (diameter, WT, SMYS, type of pipe and seam, joining methods, coating, design parameters
- Appurtenances (valves, fittings, dead legs, instrumentation, indicators)
- Facilities (pump stations, booster stations, storage, terminals)
- Crossings
- Corrosion mitigation equipment

2) _____

- Date constructed, inspection, alignment sheets, methods
- Coating installation
- Right of way

3) _____

- Type of product, P/Q/T history
- Systems and processes: SCADA< leak detection, emergency response, public awareness, one-call, training, etc
- Inspections: corrosion, valve, row, etc
- Reports: failure investigations, incidents, sampling, engineering assessments

4) _____

- Hydrostatic pressure tests
- ILIs
- Weather Events
- Repairs

Example Pipeline

Attributes

- OD: 8.625 inches
- WT: 0.203 inches
- Length: 31.2 miles
- SMYS: 35 ksi
- MAOP: 720 psig

Operations

- Crude Oil
- Limited SCADA
- No Leak Detection

Assessment

- No ILI or Hydro Available
- Annual CP Readings (low)

Construction

- Install 1960s
- Alignment Sheets
- Welded
- Tape Wrap Coating
- Seam: Unknown

Additional notes

THREATS

9 Threats to Pipelines

from from B31.8S (Managing System Integrity of Gas Pipelines)

1) _____
2) _____
3) _____
4) _____
5) _____
6) _____
7) _____
8) _____
9) _____

SCAN ME SCAN ME SCAN ME SCAN ME

For more info.

Threat Categories

_____	_____	_____
• External corrosion • Internal corrosion • Stress corrosion cracking (SCC)	• Manufacturing-related defects • Welding/fabrication related • Equipment	• Third-party/ mechanical damage • Incorrect operational procedure • Weather-related and outside force

External Corrosion

Definition

Why does external corrosion occur?

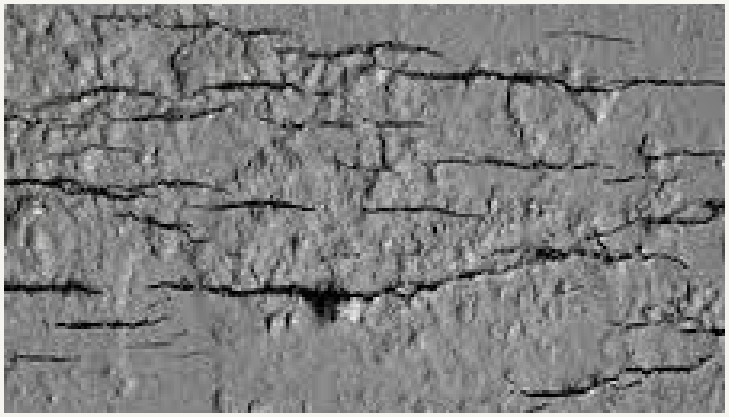
Internal Corrosion

Definition

Why does external corrosion occur?

Stress Corrosion Cracking (SCC)

Definition



3rd Party Damage/ Mechanical Damage

Definition of third party damage

Definition of mechanical damage

Incorrect operational procedure

Definition

Weather-related/outside force

Definition

Definition of mechanical damage