Sneak Peak: Integrated Well Integrity Risk Assessment Process (WIRAP)

A powerful tool to optimize well maintenance operations

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Mr. Mirza is a Senior Consultant for Oxand specialized in the Oil and Gas industry. His main focus is on asset integrity and risk assessment and he is experienced in developing solutions based around Well Integrity throughout the life cycle of a well. These solutions aim to support and optimise operational decisions for mature wells, from inspection to plug & abandon, leveraging quantification of risk associated to well integrity. Ali has worked on projects which provide decision support for prioritising intervention strategies, optimising inspections to reduce unnecessary non-productive time, improving well criticality rankings by quantifying probabilities of well system failures and designing P&A operations. He has been working alongside such companies as Shell, BP, Total, BG Group, Tullow Oil, Hess, etc... Ali has a background in Civil Engineering for which he gained a MEng from University College London.

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Poll Question

What is your age?

Poll Question

Where in the world do you work?

Poll Question

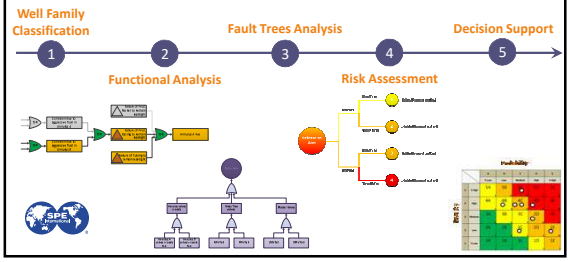
Which category does your employer fall under?

Poll Question

What is your current level engagement?

Overview

Well Integrity Risk Assessment Process → WIRAP with Simeo™



Outputs of the Steps

	Task	Output
1	Well Family Classification	Well Families
2	Functional Analysis	Leakage Pathway Diagram (LPD)
3	Fault Tree Analysis	Quantification Release Probabilities
4	Risk Assessment	Determination of Risk Profile
5	Decision Support	Risk Mapping, Well Failure Criticality etc.

Well Family Classification

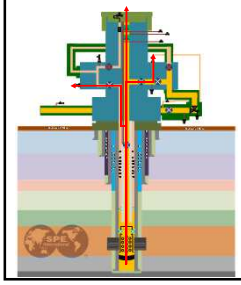
Well Stock

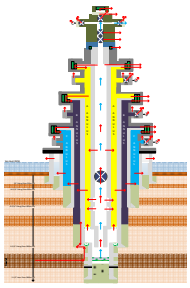
Characteristics

Classify

Functional Analysis

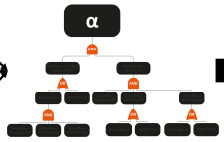
- Define System and Function
- Define Scope of analysis
- Define the environment considered





Identify Potential Leakage Pathways

Fault Tree Analysis

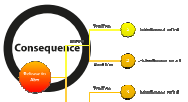


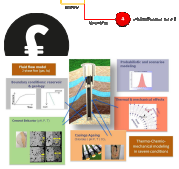
Quantify Probability

2×10^{-3}

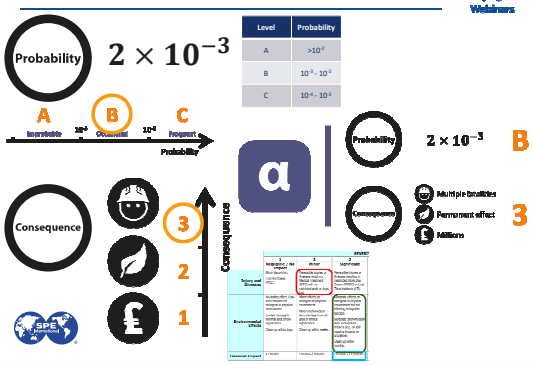
Risk Assessment

AND

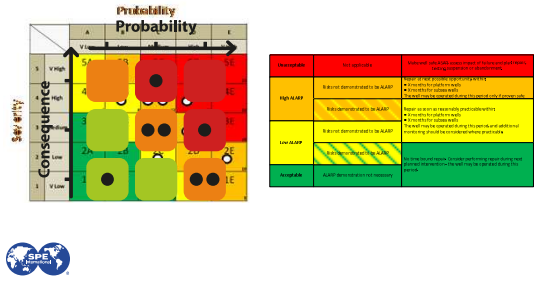




Risk Assessment

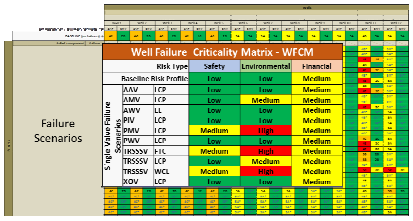


Decision Support



Decision Support

Decision Support



Sneak Peak: Case Study - Context

- Company has been producing since 2010
- Field comprises 28 subsea wells, x production wells, y water Injector wells, z gas Injector wells and a single suspended well tied back to the FPSO. 24 of the 28 wells are currently on stream.
- Minimising loss of production is a key driver to meet the field production target. Therefore, Company is looking to find ways to reduce down time, like maximising testing intervals without compromising Well Integrity.
- Company policy calls for the TRSSSVs to be tested every six months irrespective of their service or status. No TRSSV failures have been observed over the five years Field has been operating.
- Other Valves tested at the same interval as TRSSSV

Sneak Peak: Case Study - Results

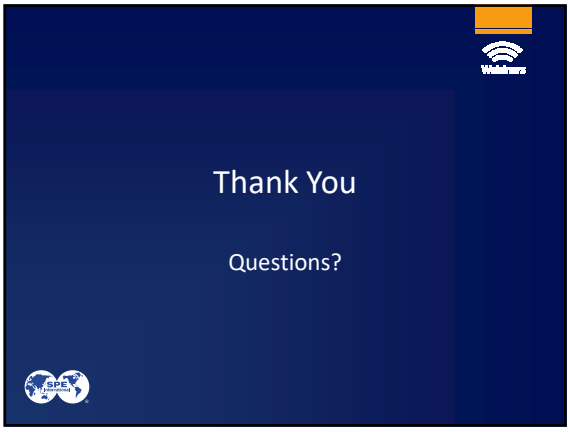
- Impact of SSSV on leakage paths
- Probability quantified with Fault Trees
- 3 types of impact
  - Safety
  - Environment
  - Finance

Change in Risk AFTER 12 Months interval - Safety Risk Example

Scenario	Well	Release Probability	Factor	%	Severity	Risk
Baseline (0 Months)	Oil producer's Points	1.45E-07	N/A	N/A	Minor	Low
	Water Injector's Points	2.19E-07	N/A	N/A	Minor	Low
12 Months	Oil producer's Points	2.89E-07	1.78	178%	Minor	Low
	Water Injector's Points	4.38E-07	1.78	178%	Minor	Low

- Risk Profile (example with Safety)
  - Probability remains in the Very Unlikely category
  - No change in level of Severity – Minor.
  - The Risk profile is LOW for Safety Risk.

Value of doubling testing intervals is estimated to be over $1 million per year at $50/bbl


Thank You
Questions?