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Maintenance and corrosion management in the global oil and gas industry

A study of the importance, impact and investment of corrosion management

Abbreviated version

OIL & GAS MAINTENANCE

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Introduction

The integrity of steel infrastructure is directly linked to the safety, security and environmental impact and reliability of energy supplies. Effective corrosion management minimizes the risk of failure and damage. It can also extend the lifespan of existing infrastructure, reduce the need for steel replacement, and limit associated environmental impact. Furthermore, corrosion-related failures are expensive to repair and result in costly disruptions and potentially serious safety risks.

From an environmental perspective, failing to maintain steel integrity can be harmful too. According to a report published in Nature in 2022, steel production represents around 10.5% of total global CO2 emissions, but by 2030, as much as 9.1% of the total CO2 emissions will be associated only with steel produced to replace corroded steel.

This, combined with an industry where in many cases assets and infrastructure are well into their life cycle, or if newly built will be required to last long-term, means that effective corrosion maintenance is a vital element of oil and gas production.

Across the world, countries are looking at how they can transition to cleaner energy to support net zero goals, while also ensuring access to reliable energy supplies. Throughout this transition, oil and gas will continue to be a key element of our energy systems. There are several challenges faced by companies producing oil and gas, including ensuring that infrastructure is fit for purpose. A key part of this is effective corrosion maintenance, which is vital in protecting the integrity, safety, and operational efficiency of infrastructure.

Corrosion management in oil and gas is important as the infrastructure, often operates in harsh environments where the risk of material degradation is high. This includes, but is not limited to, the likes of high temperature operations, the challenge of identifying and managing corrosion under insulation and the use of chemicals which weaken the integrity of materials. Any failures in the infrastructure bring with it a high risk of an incident which causes damage to people, assets and the environment – from methane and chemical leakages, to the risk of fires and explosions, loss of integrity, and fallen objects.

As a vital element of an asset's lifecycle, corrosion maintenance programs require significant investment from companies, both direct costs from expenses in relation to inspection, maintenance and repair, and indirect costs accrued during any downtime for assets or environmental clean-up required should corrosion impact an asset's operations.

As far back as 2016, a study by the National Association of Corrosion Engineers (NACE) estimated corrosion costs in the [oil and gas] industry to be a staggering $1.372 billion annually. With another study published in Nature where researches speculate that between 14 and 33% of the costs could be prevented by implementing current best practices.

When you consider this in the context of the wider challenges globally around energy, with the world facing an energy trilemma – how to balance energy security, sustainability and affordability - it becomes clear that effective corrosion maintenance is one element required to meet these challenges.

As a sector, there must be a focus on making sure companies are getting this right and developing plans which ensure any work completed is going to be what is best for the asset, safety, and the environment.

Methodology

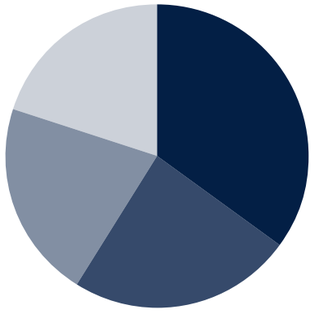
To develop a global picture of the oil and gas industry's maintenance strategies, Jotun carried out research which explores the attitudes of senior decision-makers and those who are responsible for maintenance at both on and offshore oil and gas assets. Those surveyed also claimed to have an acceptable to very good understanding of their ESG goals and ambitions.

Working with Censuswide, the survey collected the views of 1,017 senior professionals in the onshore and offshore oil and gas sectors across 10 countries, exploring the industry's attitudes to maintenance management and the near-term outlook for the sector.

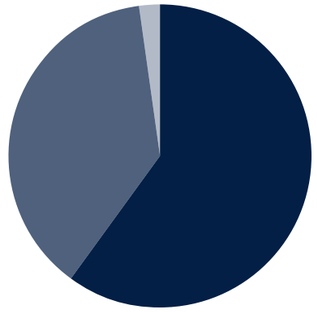
Survey respondents own or operate oil and gas assets in the following regions:

Europe	88%
South America	23%
Central America	17%
North America	16%
Middle East	11%
Africa	6%
Asia	4%
Pacific	4%

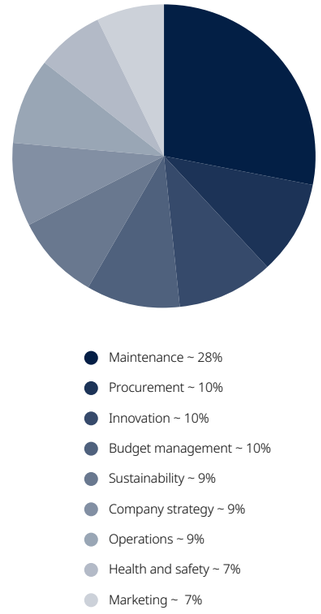
Level of seniority



Understanding of ESG goals



Current responsibilities



Executive summary

This research has shed light on key industry trends relating to maintenance and corrosion management across the global oil and gas sector.

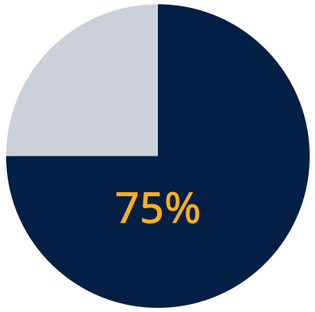
Derived from a survey of over 1,000 senior professionals, the report reveals a significant shift in the perception and prioritization of maintenance, particularly in the context of Environmental, Social, and Governance (ESG).

The survey reveals increasing strategic importance of maintenance in oil and gas industry operations. Key findings include 88% of respondents anticipate an increase in maintenance budgets over the next five years and 75% say that the requirement to report on environmental performance has led to increased investment in maintenance.

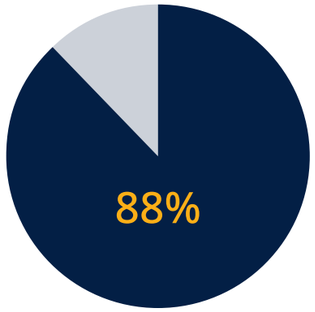
In addition to the increased focus on environmental performance, improving safety (78%) and reducing risks of fire-related incidents (76%) were mentioned as important drivers behind maintenance strategies.

This underlines the crucial role that maintenance, and corrosion management, plays in improving the safety, profitability, and environmental sustainability of oil and gas operations. However, three quarters of senior decision makers in the oil and gas industry (74%) said maintenance budgets are the first to be cut when cost savings need to be made. Survey respondents highlighted that this is making it difficult for those in charge of maintenance strategies to plan.

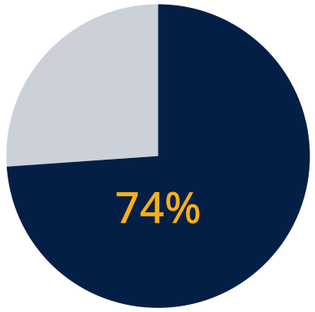
A snapshot of key data points:



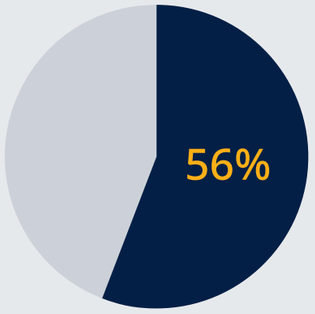
said that the need to report on environmental performance means the business has increased investment into maintenance



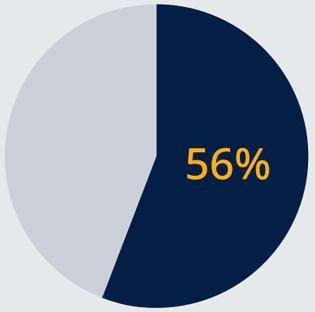
expect to increase maintenance budgets in the next five years



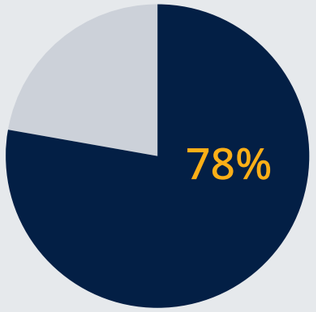
said maintenance budgets are first to be cut when cost saving



said corrosion represents a high risk to health and safety



said corrosion represented a fire hazard



said improving safety was key driver of maintenance strategy

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“There is not one particular issue we’re aiming to tackle through maintenance, they’re all equally important to us and we treat them all with the same attention. ”

Operative at an oil major