TORDIS

FLARE STACK GUY WIRE MAINTENANCE SERVICES

Flare stack is a gas combustion device used in industrial plants such as petroleum refineries and natural gas processing plants for burning off unwanted flammable gas. Many of the flare stacks are supported by guy wires to stabilize the slender structure against lateral load effects.

TORDIS is specialized on installation, inspection, maintenance, design and supply of guy wire assemblies of cable supported Flare Stacks.

Flare stack structural integrity relies on the guy wires. Deteriorated or slackened or over-tensioned wire ropes could reduce the lifetime of the structure and require costly downtime.

TORDIS is capable of providing full range of services Plan, design, procure and implement
For the maintenance activities such as:

- Design and Supply of Guy wires and Fittings
- Guy Wire Installation and Replacement
- Guy Wire Tension Measurement, Re-tensioning & Stack Verticality Check
- Inspections of Guy Wires (Visual and Magnetic Flux Leakage)
- Flare Structural Health Monitoring Guy Wires (Vibration and Tension Measurement)

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Guy Wire Installation and Replacement

TORDİS, with its IRATA certified experienced wire rope technicians and structural engineers, capable of replacing old flare stack wire ropes with a turn-key approach including equipment design and selection, material supply and site execution for the installation of guy wires in new structures or replacing aged out guy wires for flares in service.

Method statement and shop drawings are prepared prior to start of site work and new guy wires are installed, tensioned to design value while maintaining stack verticality within tolerances.

For best quality and safe installation, tensioning equipment is designed by TORDIS tailored to the specific site conditions.

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Guy Wire Tension Measurement, Re-tensioning & Stack Verticality Check

During service tension of guy wires are varies due to excessive load and wind. Wire ropes also tend to slacken with time. In order to extended life and safe operation of flare stack re-tensioning is essential.

Slackened wire ropes will lose the ability to support the structure causing stress increase in the flare body. Another consequence would be deflection of the flare tip from vertical and let the flare to oscillate under wind. This would decrease the fatigue life of the steel body of the flare. Over-tensioned ropes will also tend to undergo excessive vibration.

Therefore, TORDİS recommends performing guy wire tension checks every year.

This flare stacks should be vertical in all times within the tolerances in Eurocode. Since the verticality is also a function of guy wire tension, re-tensioning of the guy wire should be performed simultaneously with verticality checks.

- Design Tension tolerance: +/- 10 %
- Flare Stack Verticality Tolerancee: 1/1500

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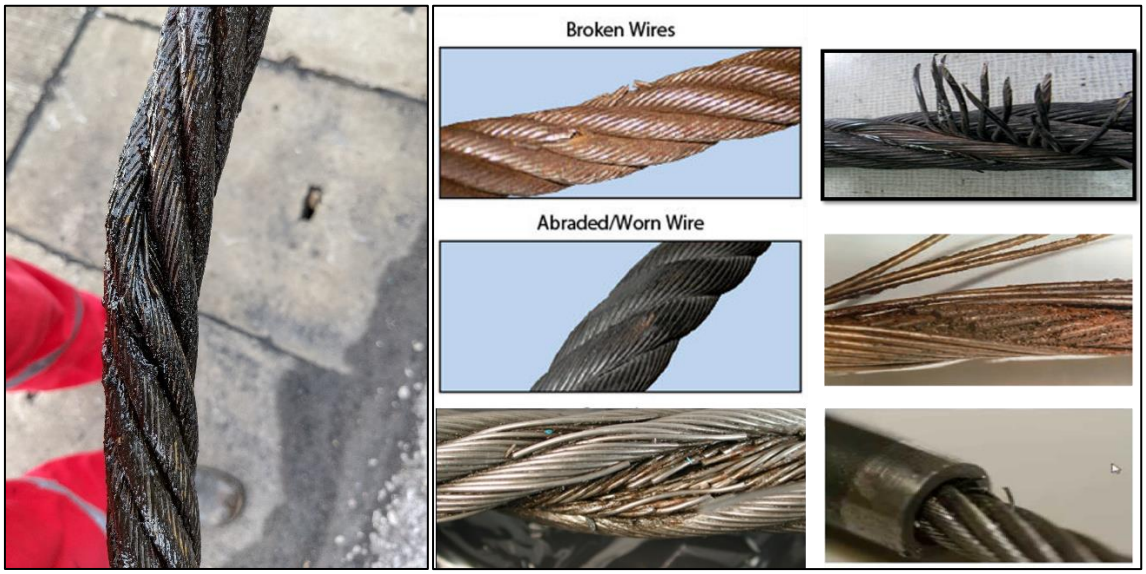
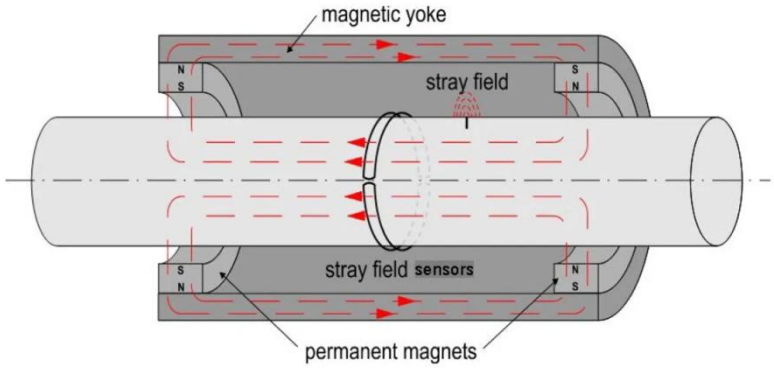
Inspection and Maintenance of Guy Wires

Guy Ropes deteriorate for many reasons and their strength reduces during lifetime. During its in-service period major failure, broken wires and corrosion occurs due to temperature, working load, wind and environmental conditions. These ropes are like chain, if one element is broken means, entire chain leads to failure. The same way, one small wire is broken, this leads to increase the stress concentration due to load and reduces strength, finally wire rope failure occurs. Few broken wire images are shown below.



Visual inspections are periodically performed, to identify the surface irregularities at certain extent. With visual inspection, only outer wires could be observed which is roughly 20% of the total wires in the cable.
In order to evaluate inner wire a Non-Destructive Testing method such as Magnetic Flux Leakage method needs to be adopted.



The measurement instrumentation is designed to detect local faults (LF) and loss of metallic area (LMA). Local faults are generally wire breaks while loss of metallic area is generally categorized as a gradual or extended loss in cross-sectional area due to corrosion, wear, or other wire rope deterioration mechanisms.

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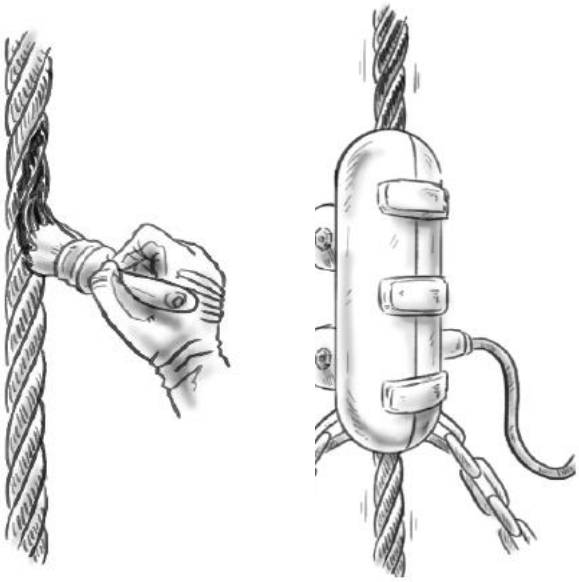
For maintaining wire ropes in good condition, another essential attempt is to lubricate the wires from outside, making sure that the center core receives sufficient lubricant. A combination approach in which a penetrating lubricant is used to saturate the core, followed with a coating to seal and protect the outer surface. This application prolongs its useful service life by increasing the corrosion protection and reducing the rate of development of broken wires due to less friction between the wires.



TORDIS recommends checking and re-application of the lubrication during annual inspections.

TORDIS always uses best quality. Below is the list of our solution partners in our projects: