TEUFELBERGER DAMAGE RATIO CALCULATOR (TDRC)

Increase safety, reduce costs

Together in Motion

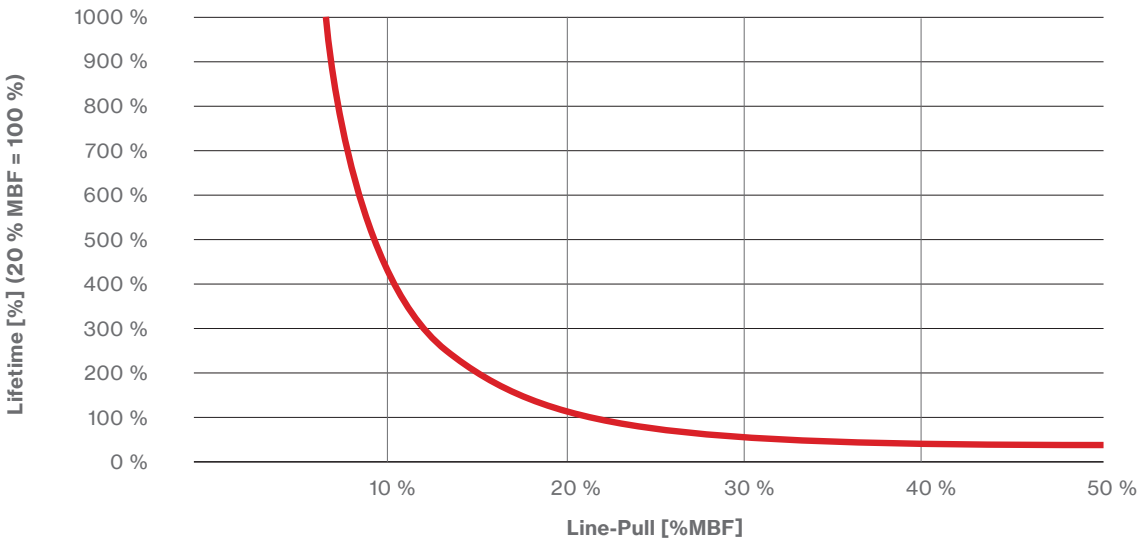
WE CARE MORE FOR MARINE RISER TENSIONER ROPES

Marine riser tensioners are important devices used on an offshore drilling vessel which provide a near constant upward force on the drilling riser independent of the movement of the floating drill vessel.

Ropes in this special application operate under difficult circumstances. As deck loads became a more critical factor, new systems use fixed rope lengths. In the new fixed systems without storage drums the ropes are bent over sheaves most of the time at almost the same position.

We care more about rope retirement and your safety on board

It is rather difficult to find the right time to discard the ropes, especially during operation. Therefore ropes are currently discarded based on recorded ton-cycles. But ton-cycles are not a proper figure to represent the lifetime of a wire rope, because ton-cycles are mistakenly based on a linear relationship of life time vs. line pull. The following graph shows the actual relationship, which is nonlinear:



An MRT operating 100.000 cycles with a line-pull of 10 tons runs 1.000.000 ton-cycles. Another MRT operates 20.000 cycles with a line-pull of 50 tons runs also 1.000.000 ton-cycles. Theoretically, the ton-cycles are equal in both cases, but in reality the cycles with a higher line-pull causes more damage to the rope than those cycles with the lower line-pull. Hence this example shows the limited applicability of the ton-cycle approach.

10to x 100.000 cycles ≠ 50to x 20.000 cycles

TEUFELBERGER Damage Ratio Calculator (TDRC)

Experience has shown that ropes are often discarded either too early or sometimes discarded too late, and that the real performance of an MRT rope cannot be assessed only by the usage of ton cycle calculations.

TEUFELBERGER once more proved its position as innovative partner in special steel wire ropes and developed an alternative, reliable method to evaluate the performance of MRT ropes - the TEUFELBERGER Damage Ratio calculation (TDRC). The TDRC is based on a theoretical model that calculates the damage ratio as a degree for rope degradation and determines the earliest possible moment of rope failure.

The calculation combined with a practical inspection result in an ideal rope lifetime. This leads to:

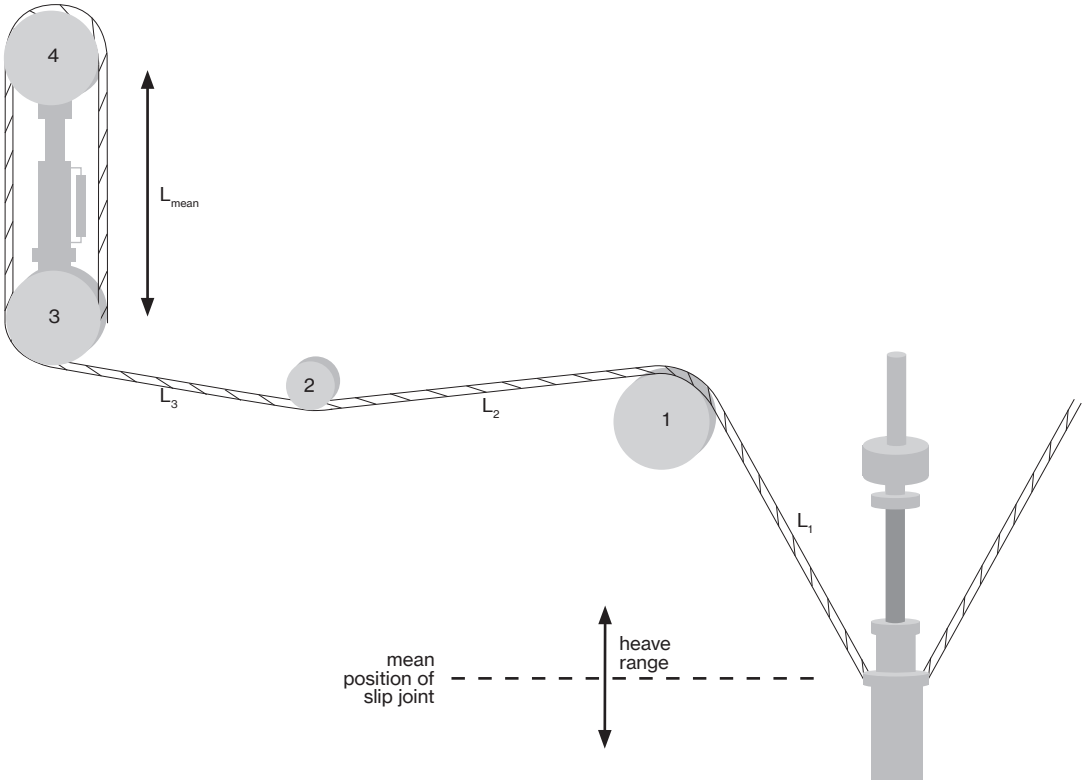
✓ **Increased safety** due to daily rope condition monitoring
✓ **Pre scheduled** rope changes
✓ **Decreased cost** because of less downtime

Influencing factors

- Heave Motion
- Heave Cycles
- Tension Force

Earliest moment of rope failure

Schematic presentation of an MRT-system



Data needed:

- Ton cycle records of the rig (considering the whole lifetime of a rope)
- Heave motion data of the rig (considering the whole lifetime of a rope)
- Access to discarded ropes

By the combination of theoratical calculations and practical inspections the real rope lifetime can be determined. Therefor we need access to the discard ropes.
In addition users are able to check the status of their ropes on a regular base by updating their calculations online on their own.

To do so please send an Email to **wirerope@teufelberger.com,** you will then receive the access data.

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