



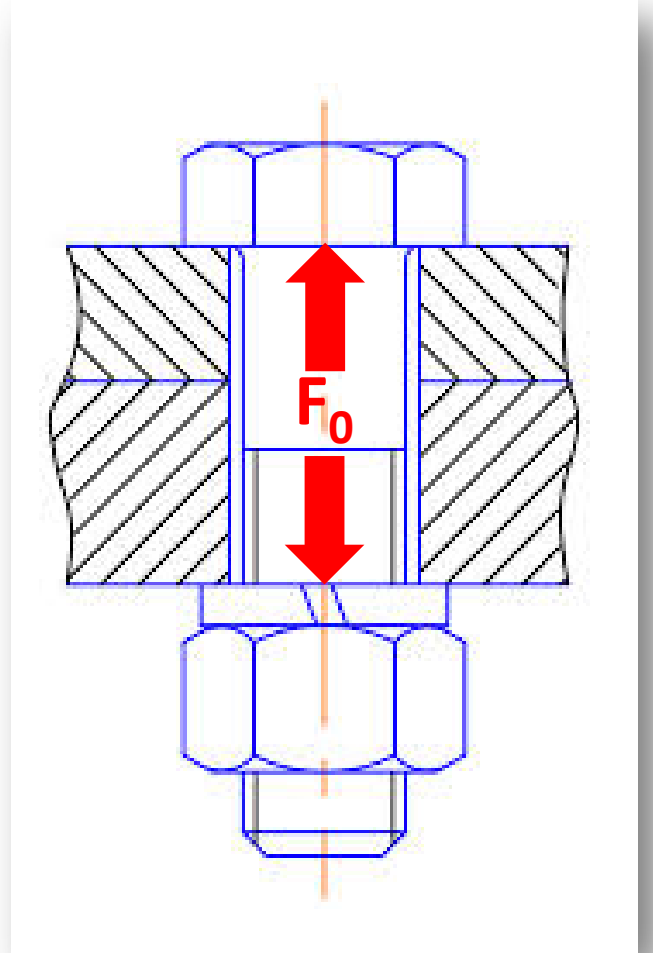
Gösta Rydin *Key Account Manager*
Csaba Madru *CTO – Chief Technical Officer*



- Applications consist of several parts.
- To achieve functionality the parts must be joined.
- Bolts and nuts is the most common way of joining parts.

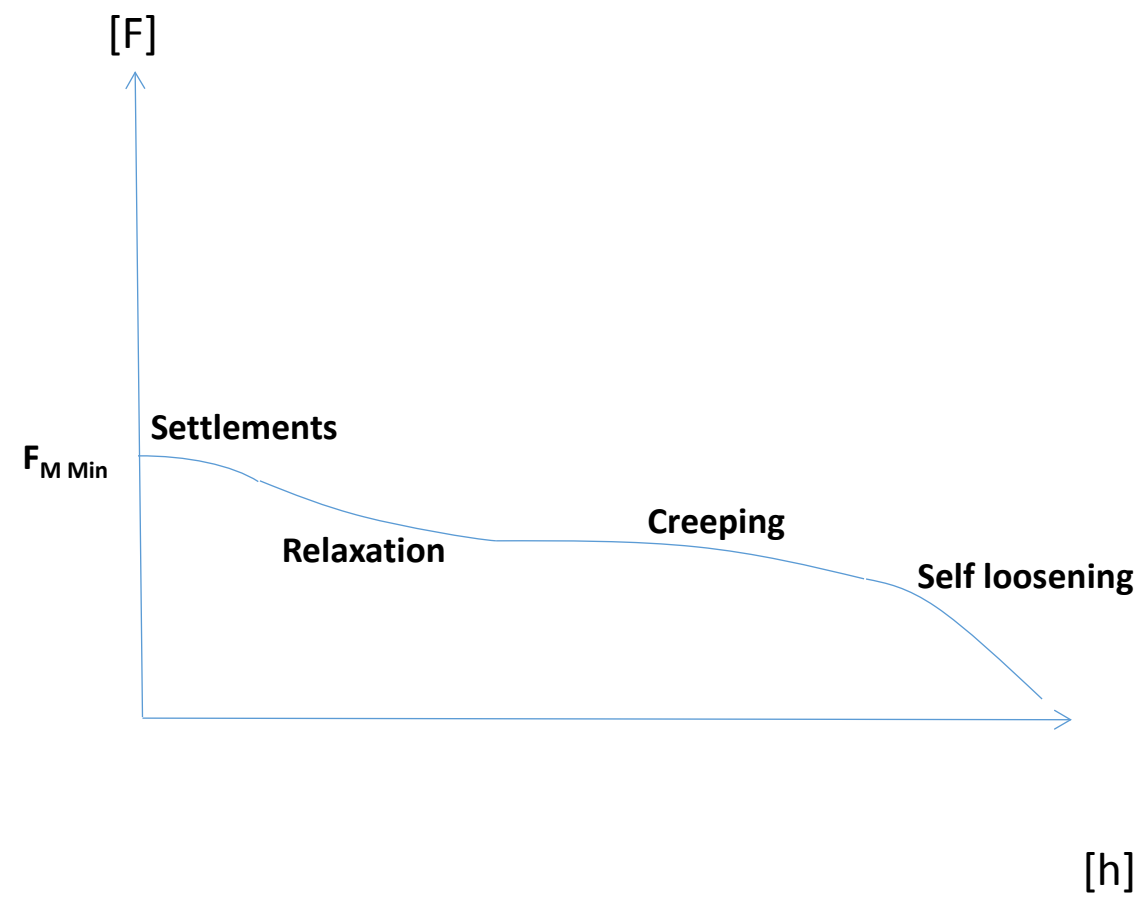
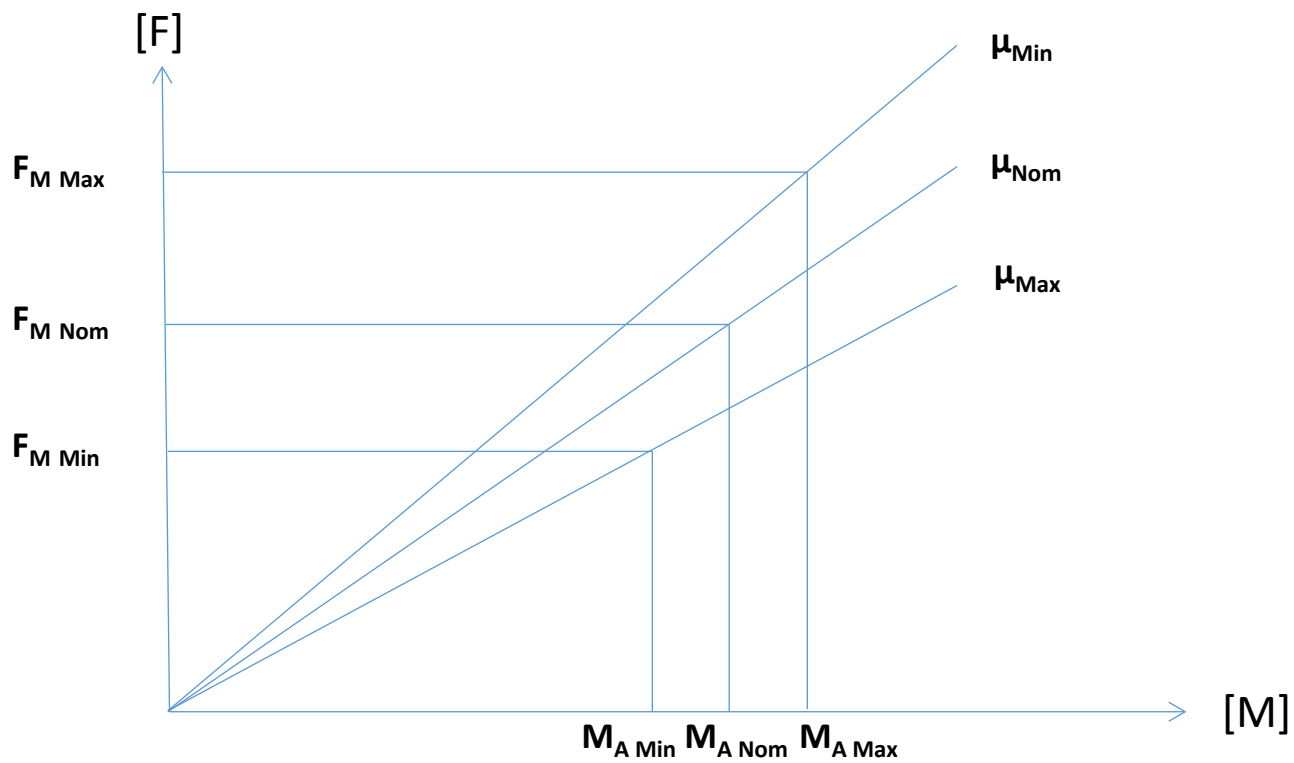


- In order for the parts to stay joined they must be correctly preloaded.
- Most bolted joint failures are due to incorrect preload.
- Inaccurate tightening and loosening phenomena.



- Every 3rd week an incident due to failed bolted joints occur on an offshore installation on the Norwegien continental shelf.*





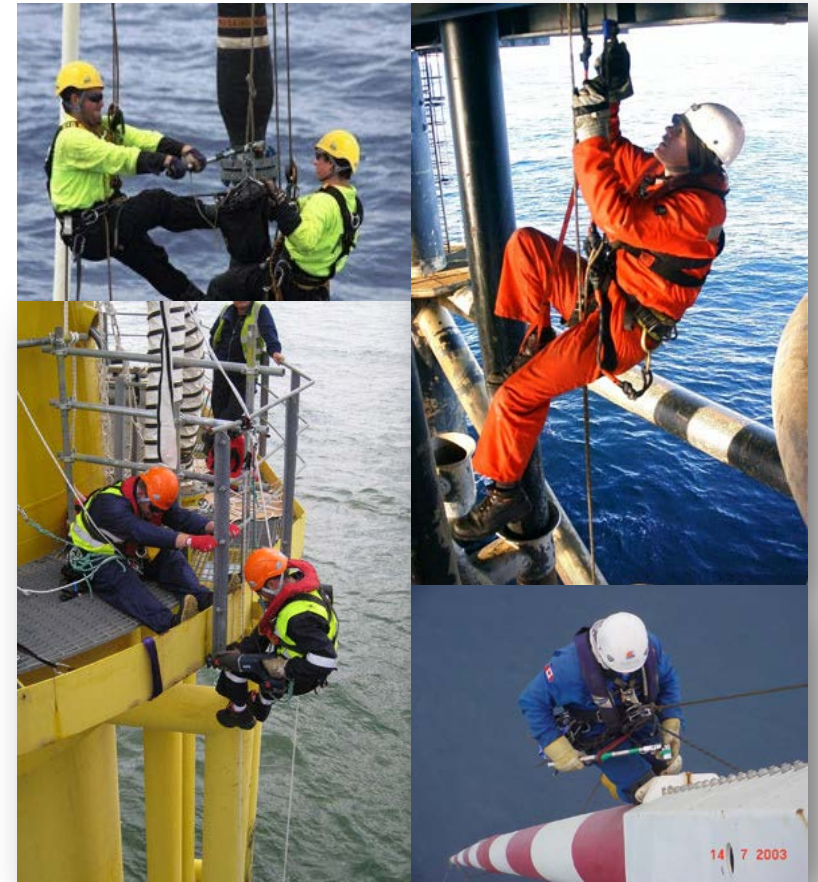


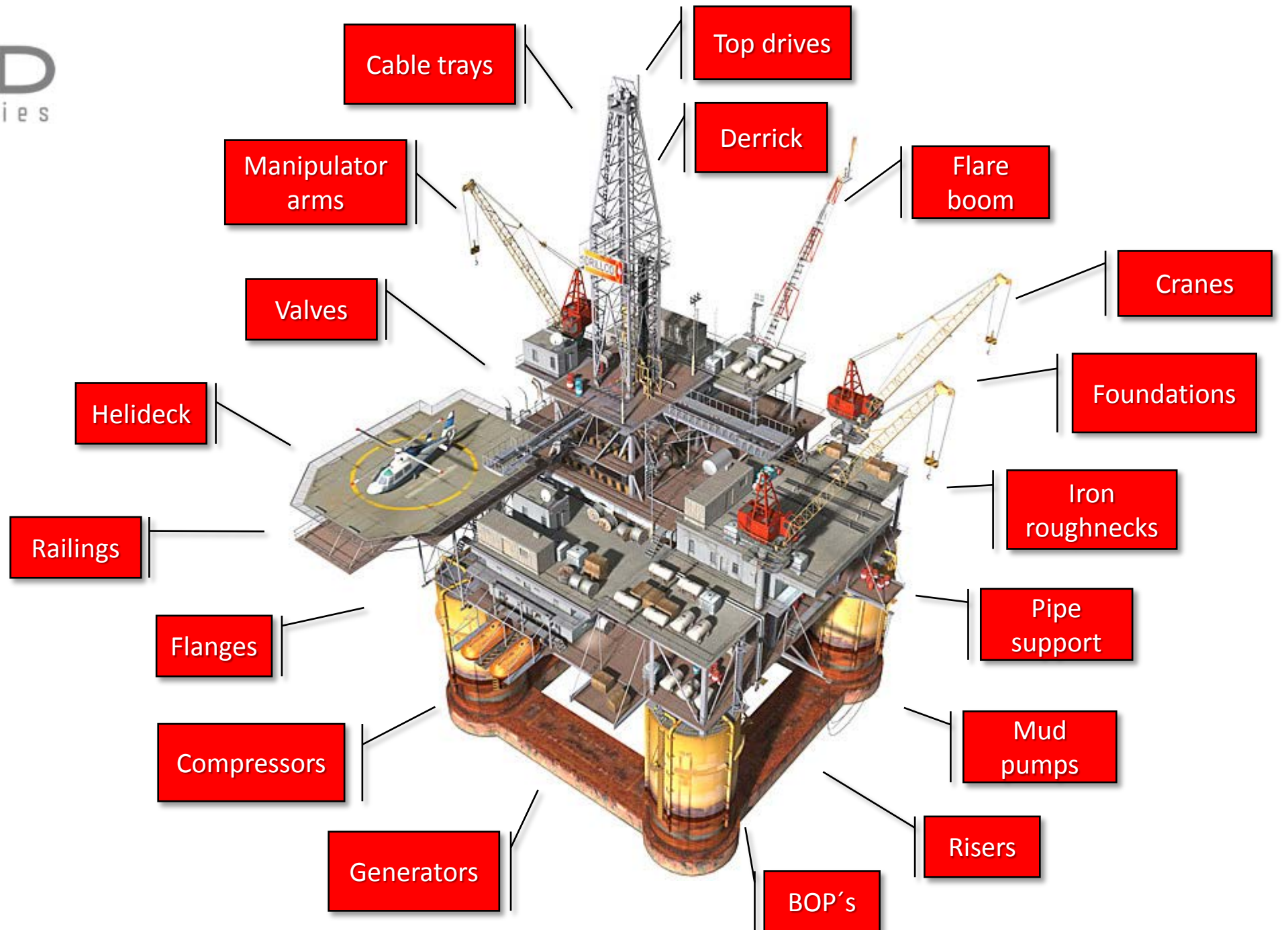
Challenge 1) Achieve the correct preload during tightening.

Challenge 2) Monitor and verify the preload level during operation.

Today's inspections cost:

- Down-Time
- Money
- Risk



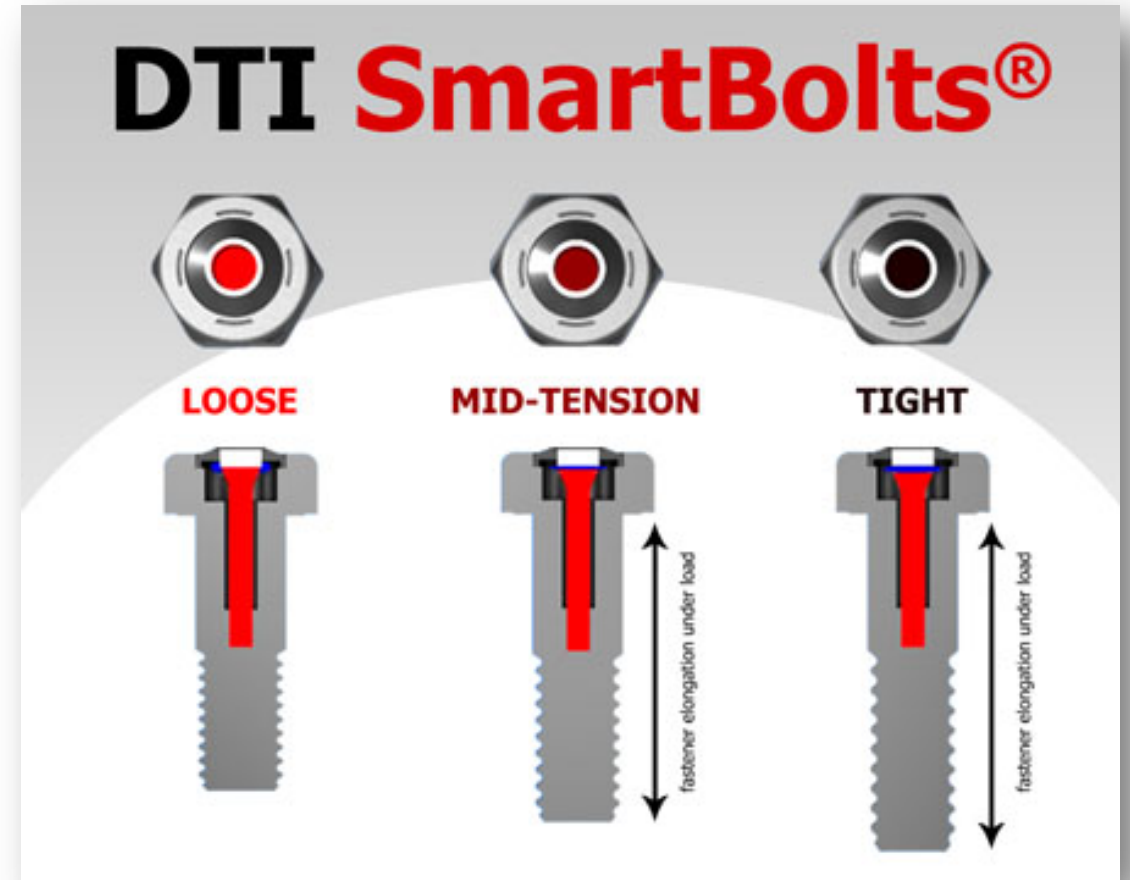


SmartBolts[®]

Visual Indication System



- Standard bolt with microindicator which reacts to the bolt elongation.
- No or minimal loss of fastener capacity.
- Every bolt is tested and calibrated.



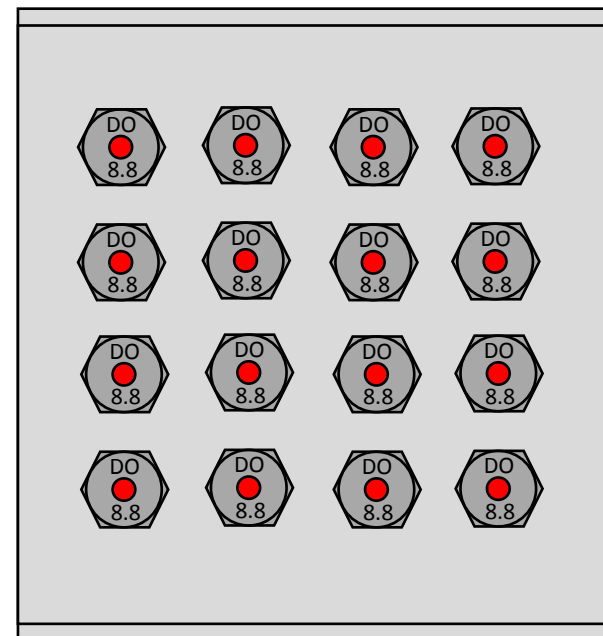
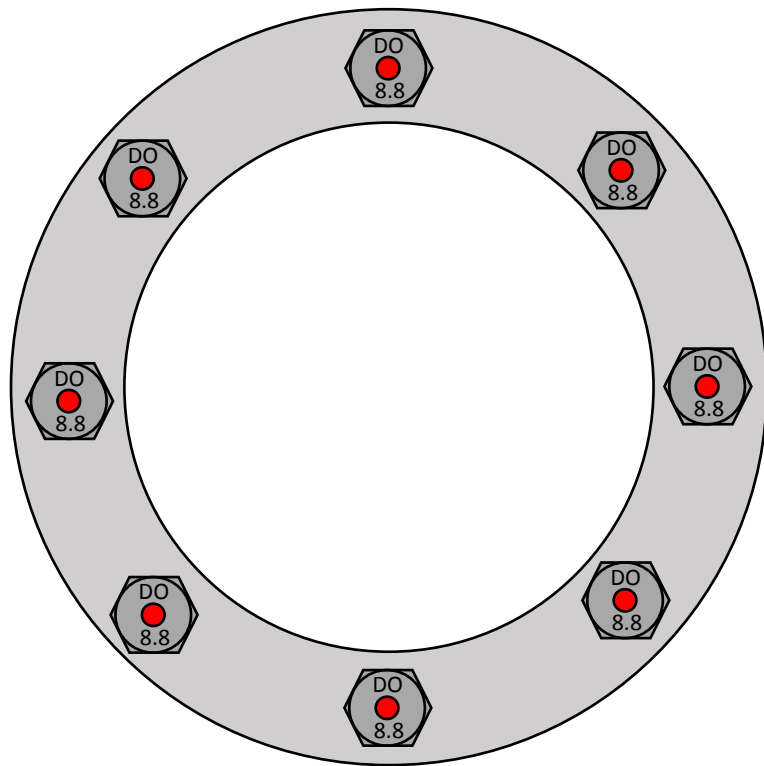
SmartBolts[®]

Visual Indication System

Standard size ranges	7/16" to 1- 1/2" (M10 to M36)
Standard length range	1- 1/4" to 16" (30mm to 400mm)
Standard grades	Grade 5, Grade 8, (Class 8.8, Class 10.9)
Standard finishes	HDG, Zinc-flake, Plain, Clear zinc, Yellow zinc
Threading	Partial or Full (ISO 4017 / 4014)
Materials	Carbon steel, Stainless steel
Standard tension range	70% of proof load (customized 30-90% of proof load)
Accuracy	+/- 10% of design tension
Operating Temperature Range	-4°F to 168°F (-20°C to 75°C)

SmartBolts[®]

Visual Indication System





GO



NO-GO

Tomorrows inspections reduce:

- Down-Time
- Cost
- Risk





Thank you for your attention.

