FACTS
Harding is a jack-up production unit serving as a manned production facility for the Harding Field, in Block 9/23b, 320km North East of Aberdeen in the Central North Sea.
- TAQA has a 70% interest in the installation and is the operator. The other partner, Maersk, holds 30%.
- Field discovered in February 1987.
- Construction started in 1993 and production start-up was in 1996.
- Located 320km North East of Aberdeen in the Central North Sea, in water depth 110m.
- Harding is a heavy-duty jack-up production unit, resting on a gravity base storage tank capable of holding 600,000 barrels of oil.
- Peak production (ca. 1998) 100,000 bpd.

CONNECTIONS
Oil from Harding is exported via a 24-inch diameter oil export pipeline to a submerged tanker loading system.

GMC SNAPLAY CONNECTORS
- Concentrically Threaded
- Multiple Metal-to-Metal Nib Seals
- ID & OD Preloaded Contact Shoulder
- Highly Fatigue Resistant (> DNV-C1)
- Torsionally Slip Resistance
- Fast Make-Break Cycles
- Qualified to ISO 21329 & API Standards
- Wide Range of Sizes (8”- 42”)

GMC INTELLIGENTLY CONNECTED PIPE (ICP™)
- 40% Lighter Conventional Welded Pipe
- Anti-Corrosive, HPHT Ready
- Installed from Lower Cost Vessels
- No Offshore Welders
1. SnapLay, which incorporates the established mechanical connector series of reusable, non-rotational underwater connectors developed by Hunting Oil Field Services for open-hole installations and platform tie-backs, also enables laying of larger diameter pipelines from smaller, more economic vessels.

Moreover, connectors and spools are available in a wide range of materials, making the system particularly suitable for specialist service applications. For seabed connections, snap-link spool pieces can include any feature from Y pieces and ESVs to entire protective structures.

2. The system's first application was the make-up in the summer of 1995, of two km of 24-inch pipeline for BP's North Sea Harding Field development. Planned installation methods here involve firstly laying of 72 metre spools accurately positioned by guidewires from Ugland’s MSV Maxita, with makeup of mechanical connectors being carried out by an underwater crawler deployed from SubSea’s DSV Mayo.

3. Make-up tools comprise a mobile frame with three clamps run on tracks. The crawler vehicle is then positioned over the pipeline and spool ends. The first clamp manipulates the pipeline in an X and Y plane while a second grips and manipulates the spool-end and, with two metres of longitudinal travel, inserts the pin of the connector into the box.

A make-up clamp is then deployed over the two connector halves, pressure-injected to separate the teeth, and make-up force is then applied. The crawler subsequently releases the pipe and proceeds to the next designated connection.