



Marginal and Mature Field Development and Operation

6 – 7 August 2024 | KUALA LUMPUR, MALAYSIA



Satellite SCM Skids

Enabling Flexibility, Fast-tracking and Reliability in Subsea Field Design and Installation

Vandana Crispin

Senior Manager (Controls, Intervention, IMR and Decommissioning), Asia Pacific



Satellite SCM skids enabling unconventional Subsea tie-backs

Issue

- Operators wanting to use available XT of opportunity to enable a subsea tieback project deadline

Solution

- Satellite SCM Skids where the SCM sits outside the XT and all the hydraulic and electric controls are managed outside the XT structure. Enables unconventional tiebacks

Track Record

- **Projects** Bayu Undan, Pluto Infill and Spar Halyard



Case Studies - SCM Skid & Controls Jumper Deployment Frame

Overview

- Satellite Control Module (SCM) Skids support flexible, optimized, and economic tiebacks.
- Positioned outside the Christmas Tree (XT) structure.
- Enable integration of XT and SCMs from different vendors into a single tieback.
- Streamline project schedules for faster execution.
- Overcome XT availability constraints without compromising control integrity.

Challenges and Solutions

- XT from specific manufacturers (OEMs) integrated into XT or manifold.
- New tie-back compatibility often requires the same XT vendor, limiting choice.
- Scheduling challenges due to manufacturing availability.
- Australian projects faced delays due to incumbent XT OEM supply issues.
- Use existing XT from another OEM to meet schedules.

Case Studies - SCM Skid & Controls Jumper Deployment Frame

Satellite SCM Skid Benefits

- Maintain control of the entire field via the same subsea control system.
- Ensure compatibility and seamless integration with new XT types.
- Integrate hydraulic and electrical flying leads, termination heads, control tubing, and housing structure.
- Enable use of existing XTs without loss of functionality, regardless of manufacturer.
- Applicable to refurbished trees.

Operational and Economic Advantages

- Overcome XT supply constraints related to manufacturing.
- Optimize project costs and schedules.
- Reduce critical path risk with plant contention at incumbent OEM facilities.
- Enable parallel work efficiencies during SCM skid manufacturing.

Benefits to Operators

More flexibility to mix and match assets in field without losing functionality – TFMC, OSS, Unitech, Siemens, ODI

OEMs able to be more flexible in offering non standard solutions if it meets a client need, increasing their flexibility

Bring forward schedules for installation. reducing risk with plant contention and parallel work efficiencies

Locally manufactured solutions in APAC for the integration



Case Studies - SCM Skid & Controls Jumper Deployment Frame

Field reaching end of life and required a single well tieback to maintain production while new project FID pending

Field hardware all TFMC, but TFMC unable to supply new electro-hydraulic XT to meet the 1-year project schedule

Client were able to secure a reconditioned Baker direct hydraulic XT meeting project requirements but were unable to control it

Solution – Remotely mount TFMC SCM and route functions to XT via static jumper and stab plate

Case Studies - SCM Skid & Controls Jumper Deployment Frame

Skid Design & Qualified to – DNVGL-ST-E273

Small bore tubing Compliant to ISO13628-5

Structural Fabrication – AWS D1.1

Tubing Fabrication – ASME BPVC Section IX & B31.3

Foundation Design – API-RP-2GEO

CP Design – DNV-RP-B401

Case Studies - SCM Skid & Controls Jumper Deployment Frame

Supplied equipment to facilitate control of a new subsea BH XT via an existing TFMC control system

APAC based design analysis, fabrication and testing of SCM Skid, HFL, EFLs, Deployment Frame and all associated ancillary equipment

Incorporate Company provided items (TFMC SCM, SCMMB, MQC, Inconel tube) into above equipment

FAT at Jandakot and SIT at Baker Hughes

Co-ordinate Independent Verification

Significant experience in Orbital welding on small bore tubing & Super Duplex Piping and Valves

Case Studies – Scope of Supply

SCM Skid

- TFMC SCM, TFMC MQC and Unitech MQC
- Welded tubes for hydraulic control lines
- Folding Mudmats
- ODI Electrical Harness
- 2x Chemical Injection Ports

HFL/EFL Deployment Frame

- Subsea frame for deployment of 1 x HFL
- 2 x EFLs
- Folding Mudmats

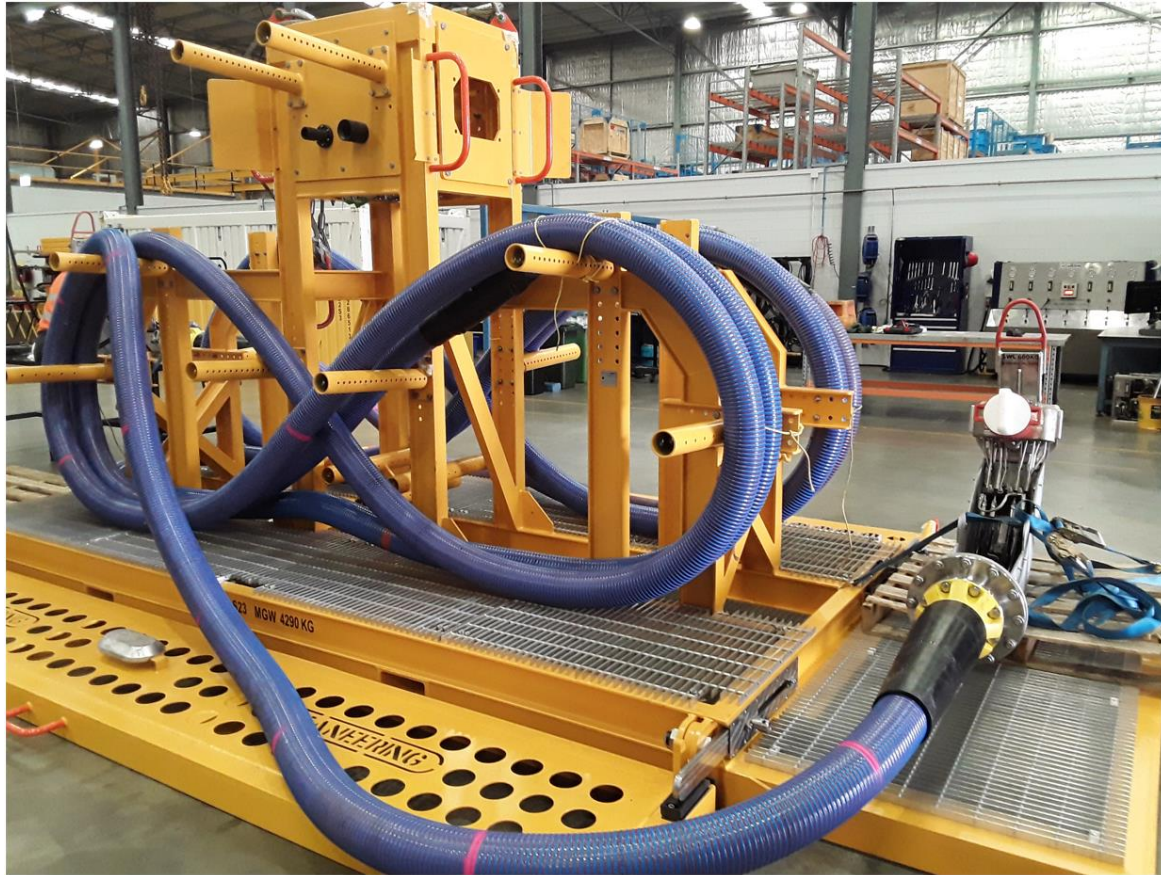
EFLs

- 2 x Electrical jumper between TFMC SCM Skid
- and the new subsea BH XT
- 1 x spare
- 50m long ODI x DigiTRON connector
- Tronic End 1; ODI End 2.

Hydraulic Flying Lead (HFL)

- Connects SCM Skid and BH XT
- Unitech Charlie 1 Fem MQC
- 14 core loose hose bundle
- PVC outer sheath
- Integrated BSR

Cobra Head Assembly



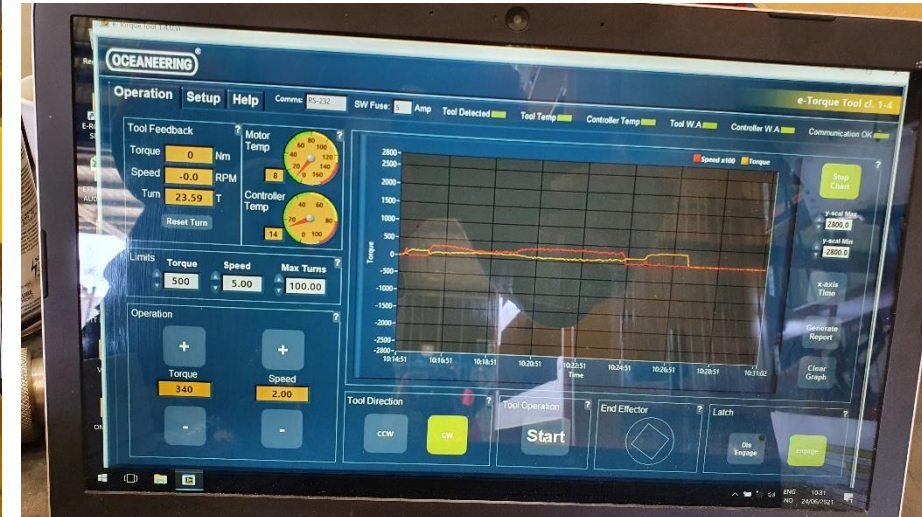
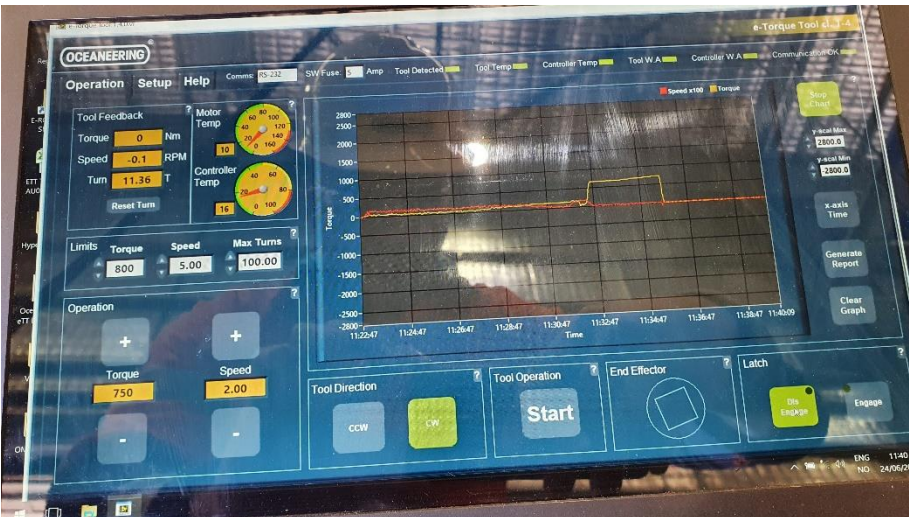
SCM Installed – FAT

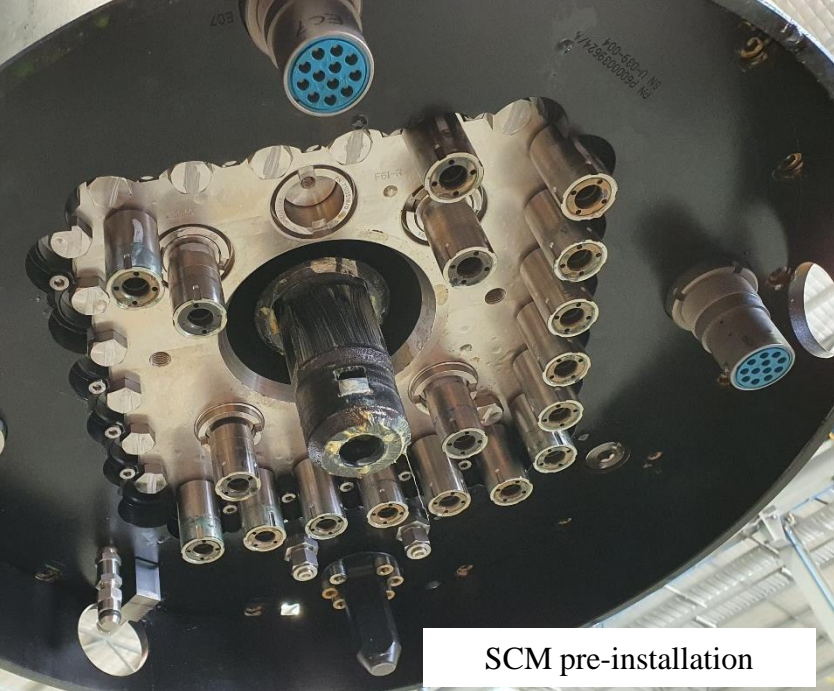


TFMC T&F Plate Installation



Unitech Cobrahead Installation





SCM pre-installation



EC7 CP isolation at ROV panel end



EC7 stab plate connector



SCM EC7 to SCM body continuity



SCMMB top view before SCM installation



- Projects Successfully Delivered – Bayu Undan, Pluto Infill, In Progress - Spar Halyard,

Projects Successfully Delivered – SCM Skid & Frame – APAC - 2021



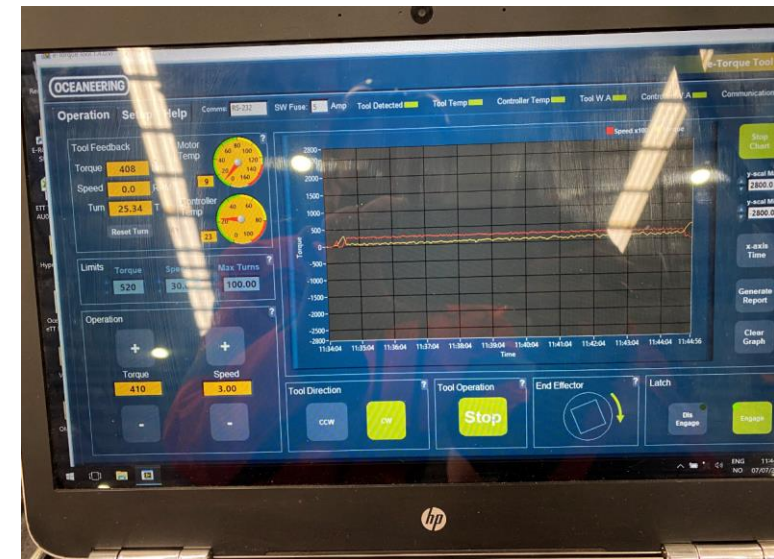
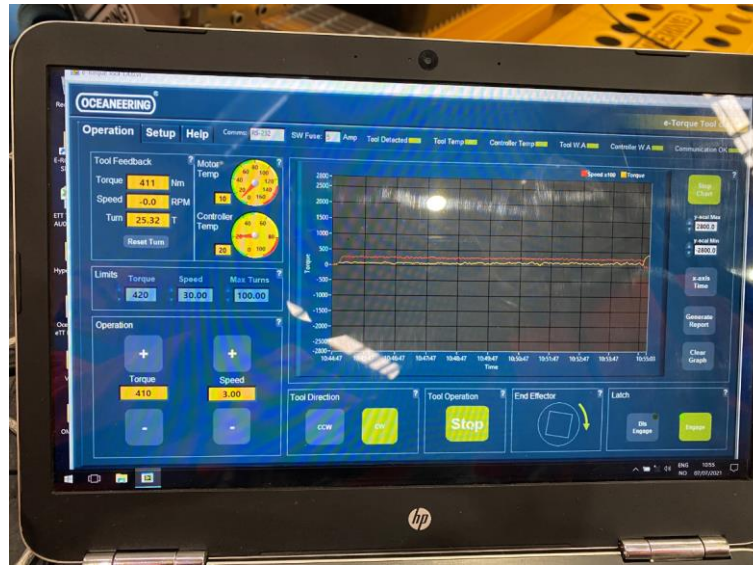
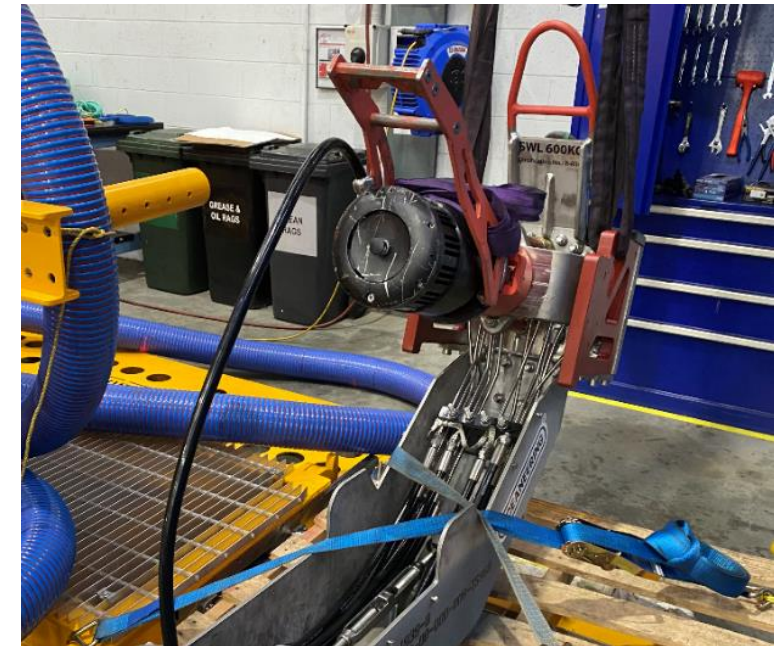
Stencils on HFL (End A & End B)



End A Interface Checks



End B Interface Checks



Projects Successfully Delivered – APAC Pluto SCM Skid -2023



Projects Successfully Delivered – Woodside Pluto SCM Skid



Satellite SCM skids enabling unconventional subsea tie backs - Take Aways

Future Adoption and Collaboration

- Likely increase in adoption of Satellite SCM Skids globally, especially in remote locations.
- Collaboration among OEMs crucial for standardization and scalability.
- Empower operators to navigate complex tie-back scenarios confidently.
- Benefits OEMs by increasing potential subsea fields for supply.

Proven Technology

- Field-proven and tested in Asia Pacific fields.
- Game-changing, repeatable technology.
- Optimizes operations with advanced engineered solutions.
- Introduces flexibility to meet emerging demands globally.
- Economic, timely, and environmentally friendly method.

Satellite SCM skids enabling unconventional subsea tie backs - Questions ?

