Introduction

- Offshore platforms are to be removed after life time cycle is finished if they represent an hazard to navigation

- For North Sea platforms removal is mandatory
  - Jackets to be removed up to 6ft below seabed

- Derogation
  - For concrete base platforms
  - Jackets weighing > 10,000 mT and in a water depth > 100m can apply for Derogation: leaving the “Jacket footings” in situ with a cut elevation at the top of the pile stick ups

- Parties involved
  - Government: Regulator
  - Marine authority: MWS
  - Client; Oil companies (Partners)
  - Contractors
  - Green party; NGO’s
  - Other stakeholders e.g. fisherman
Project highlights

- Removal is not a reverse installation

- Removal is still relatively new in the industry

- Procedures are not fully standardized

- Platforms are not designed for removal

- Structure might have been modified along the years or can be damaged

- Safety standards at the time of installation are different from present (e.g. use of hazardous substances)
## EPRD SoW

<table>
<thead>
<tr>
<th>Field/Platform</th>
<th>Topside weight (Tonnes)</th>
<th>Jacket Weight (tonnes)</th>
<th>No. of leg Piles</th>
<th>Water depth (m)</th>
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Engineering Challenges

- Verification of existing old and limited information (3500 drawings received)
- Weight engineering including offshore visits for verification
- Set-up of structural models
- Structural integrity verification
- Lift configurations including new lift points
- Hook down engineering
  - work packs structural
  - work packs piping, electrical etc
- Load-in engineering
- Disposal engineering
Topsides Removal Challenges

- Modules originally designed for lifting
- (Unknown) modifications during lifetime
- Identify hook down scope
- Potential hazardous substances (asbestos)
Jacket Removal Challenges

- Most of jackets were originally designed as Launch Jackets
  - Investigation of removal methods
- Weight increase
- Structural integrity verification
- Subsea tools to be procured or developed and tested
HMC approach

Scope definition for all phases

- Phase 1
  - Platform surveys
    - Topside
    - Jacket (by ROV)
- Phase 2
  - Make safe
- Phase 3
  - Hook down and Topsides removal (and disposal)
  - Jacket preparation
- Phase 4
  - Jacket removal (and disposal)
Jacket inspection and preparation

- 2x UHD ROV + Subsea Tools

- Inspection
  - General visual inspection of the jacket
  - Pre and post removal seabed survey
  - Debris identification and removal
  - Flooded members inspection

- Preparation
  - Marine growth removal
  - Drill holes on jacket legs
  - Seabed excavation
  - Drill cutting relocation
  - Removal of anodes, grout lines, risers where required
Jacket inspection and preparation

- Subsea Inspection
Jacket inspection and preparation

- Subsea Tools
Jacket inspection and preparation

- Drill cuttings relocation
- Dredging seabed around jacket legs
  To provide access to cutting tools
Jacket inspection and preparation

- **Cutting tools**
  - Water jet
  - Shears
  - Diamond wire
Jacket removal

- Horizontal split
Jacket removal

- Piecemeal lift
Jacket removal

- Single lift
Conclusions

- Removal of jackets and rigs to reef
  - Experience and capability could be reused to create artificial reefs in a safe manner
Conclusions

- Removal of jackets and rigs to reef
  - Jacket left in place
  - Jacket down-ended onto seabed
  - Multiple jackets relocated in suitable place