ABYSSAL
TECHNOLOGIES

OFFSHORE STRUCTURAL ENGINEERING

Engineering Confidence for Offshore Assets

Design · Integrity · Installation · Life Extension · Decommissioning

100+
projects delivered

25+
years offshore leadership

4
offshore regions



WHO WE ARE

Specialists in Offshore Structural Engineering

Abyssal Technologies delivers Specialist Engineering throughout the offshore asset lifecycle — from Concept Development and Detailed Design to Transportation & Installation, Re-assessment and Decommissioning support.

Iconic projects include the North Sea Johan Sverdrup development and India's tallest flare structure.

ACROSS THE ASSET LIFECYCLE

Concept development	**FEED & detailed design**	**Transportation & installation**
Integrity & re-assessment	**Life extension**	**Decommissioning**



OUR JOURNEY

ABYSSAL TECHNOLOGIES

A Decade of Continuous Growth

Supporting offshore operators, EPC contractors and fabricators across the North Sea, the Middle East, India and Asia Pacific.



Established

Offshore Structural engineering practice founded

First UK project

North Sea delivery to UK standards

International expansion

Middle East and Asia Pacific clients

Long-term Agreements

Framework contracts with EPC contractors

Multi-disciplinary

Capabilities beyond structural engineering

EPCM & decommissioning

Removal Engineering and Project Delivery

KEY SEGMENTS

Nine Segments Across the Energy Value Chain

Conventional Fixed Platforms
New jackets, topsides and piles

Re-assessment & Re-certification
Life-extension studies for ageing platforms

Topside & Jacket Modifications
Strengthening, repair and extensions

FPSO Modules
Process and compressor modules

Offshore Wind
Substation and Support structures

Jack-up Rigs
Retrofitting, rig moves and re-assessment

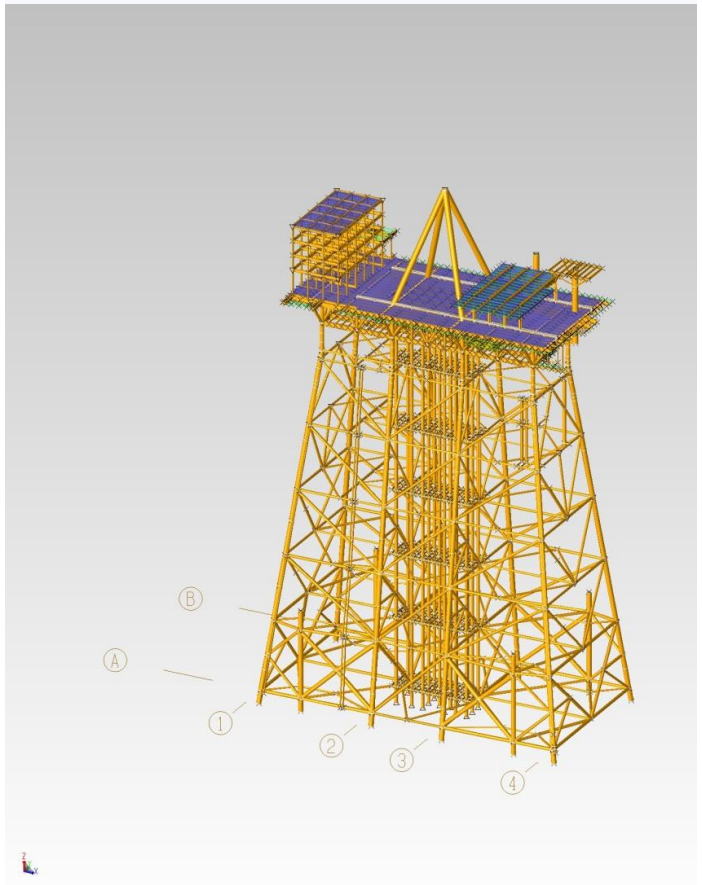
Decommissioning
Removal of platforms and onshore assets

Downstream — Refineries
Process-plant and flare structures

Midstream — Marine
Jetties, berths and mooring structures

ABYSSAL TECHNOLOGIES

In-Service Integrity of Jackets and Topsides



In-place strength

Operating and storm cases; member and joint code checks, including punching shear

API RP 2A · ISO 19902

Fatigue assessment

Spectral and deterministic fatigue with joint SCFs and S-N curves

DNV-RP-C203

Dynamic response

Natural periods, dynamic amplification and time-domain response

ISO 19902

Wave slam

Slamming loads on splash-zone members and appurtenances

DNV-RP-C205

Vortex-induced vibration

VIV screening of members, conductors and caissons in current

DNV-RP-C205

Ultimate strength

Nonlinear pushover to collapse; reserve strength ratio (RSR)

USFOS · NORSOK N-004



REFERENCE

Load-out support frame for a 28,000 MT topside — weighing, load-out, transport and floatover (Al Shaheen)

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Engineering for Safe Execution

Load-out
Skidded and trailer load-outs, ballast sequencing, load-out support frames

Sea transportation
Barge motions, inertia loads and seafastening design (DNV-ST-N001)

Lift analysis
Single and dual-crane lifts, slings, padeyes, DAF and CoG envelope

Launch & upending
Jacket launch trajectory, flotation and upending sequence

Floatover
Mating analysis with deck support and leg mating units

On-bottom stability
Unpiled stability, mudmat bearing and sliding checks

SAFETY-CRITICAL ENGINEERING

Preparing for Extreme Events

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Blast analysis

Overpressure response of decks, walls and supports; nonlinear and SDOF methods

Ship impact

Boat and supply-vessel collision energies; nonlinear dynamic analysis in USFOS

Dropped objects

Drill-floor and deck impact checks, e.g. Diyina jack-up drill floor

Seismic assessment

Strength and ductility level earthquakes; response spectrum and time history

Redundancy studies

Member-removal cases to confirm alternative load paths

Pushover analysis

Progressive collapse to establish reserve strength and failure modes

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Going Beyond Conventional Design

Linear & Nonlinear FEA
Shell and solid models of joints, padeyes and local details

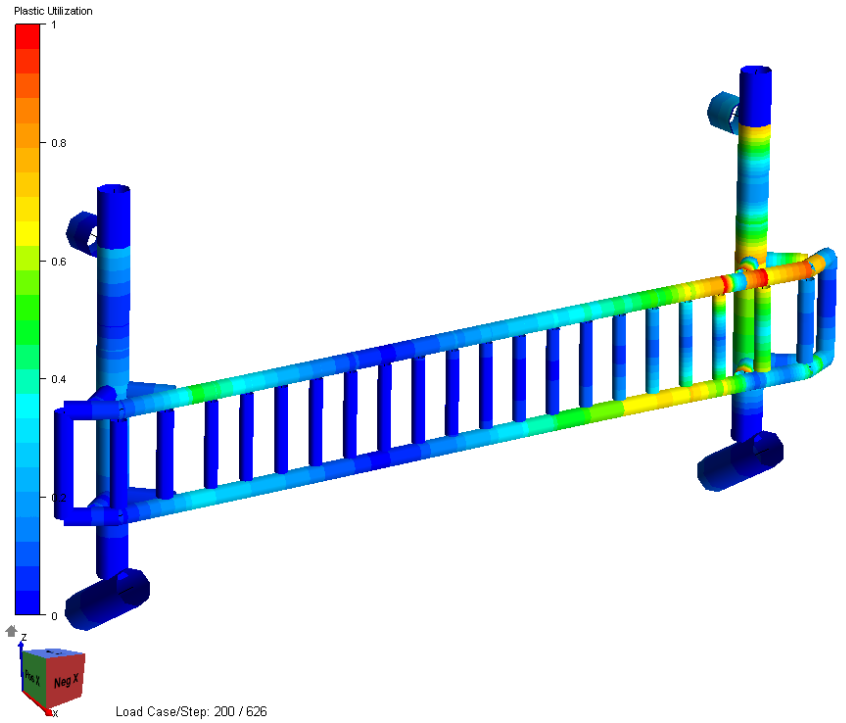
Buckling analysis
Plate, shell and member stability, including eigenvalue buckling

Stress concentration
Hot-spot stresses and SCFs for fatigue-critical joints

Pipe stress analysis
Piping flexibility and support loads on modules and topsides

Thermal analysis
Temperature gradients and thermal stresses in structures

Structural optimisation
Weight and cost savings with code compliance maintained



Riser protector impact study — plastic utilisation from nonlinear analysis

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Structure, Soil and Installation in One Team

01 Pile design
Axial and lateral capacity with p-y, t-z and Q-z soil curves (API RP 2GEO)

02 Pile–soil interaction
Nonlinear foundation springs coupled with the jacket model in SACS

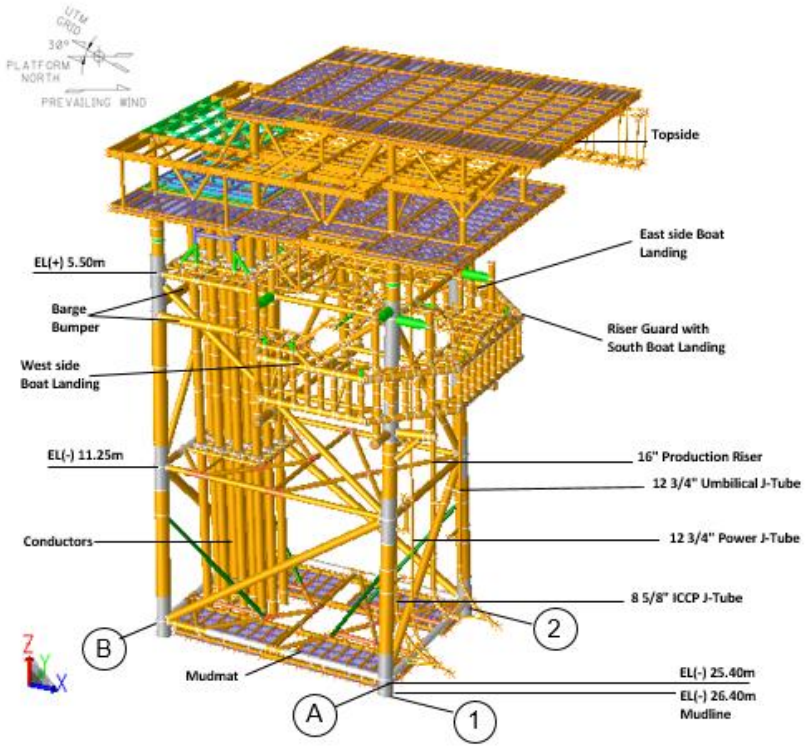
03 USFOS assessments
Collapse analysis with nonlinear pile–soil behaviour

04 GRLWEAP studies
Hammer selection, soil resistance to driving and driving stresses

05 Driveability analysis
Blow counts, refusal risk and fatigue damage during driving

06 Foundation engineering
Mudmats, skirt piles, pile sleeves and grouted connections

Few engineering companies combine structural response, soil interaction and installation behaviour expertise in a single team.



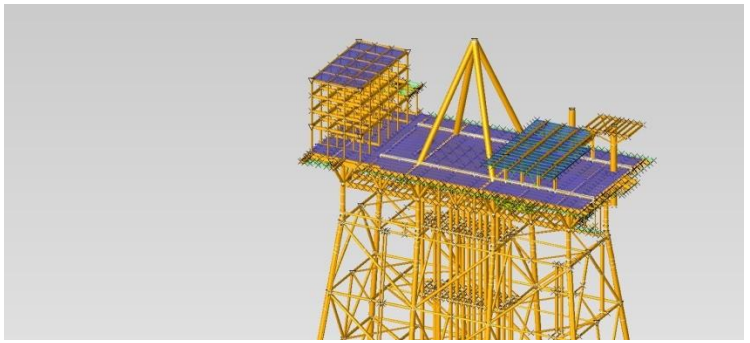
ABYSSAL TECHNOLOGIES

Selected Projects Worldwide



Johan Sverdrup, North Sea

LQ jacket detailed design; P1 & LQ FEED review



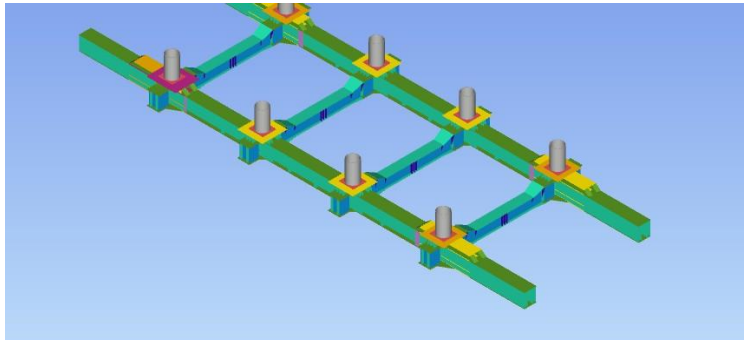
30 standardised jackets, Saudi Aramco

Marjan, Zuluf, Safaniya & Manifa — design, piles, E3D



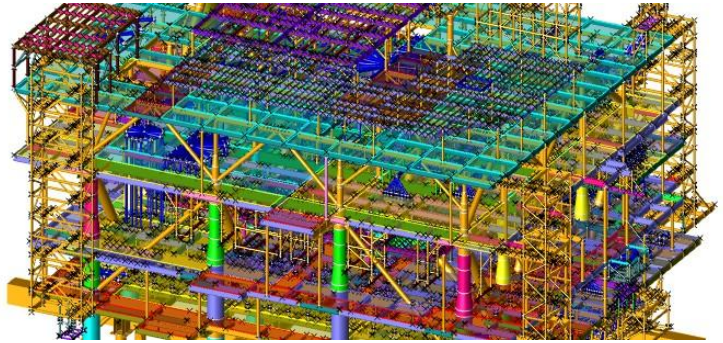
Dogger Bank South OWF, UK

OCP support structure FEED engineering



Load-out support frame, Qatar

28,000 MT topside load-out, transport & floatover



FPSO compressor modules

Bumi Armada and Ghana OCTP FPSOs



Sagar Ratna jack-up, India

Rig movement and spudcan repair engineering

TOOLS & STANDARDS

Licensed Software and Recognised Codes

ANALYSIS & MODELLING SOFTWARE

Also in-house: STAAD · MicroStation · AutoCAD

SACS In-place, fatigue, seismic and pre-service analysis

USFOS Pushover, ship impact and collapse

GRLWEAP Pile driveability

Tekla · E3D Models, MTO and IFC drawings

DESIGN CODES & STANDARDS

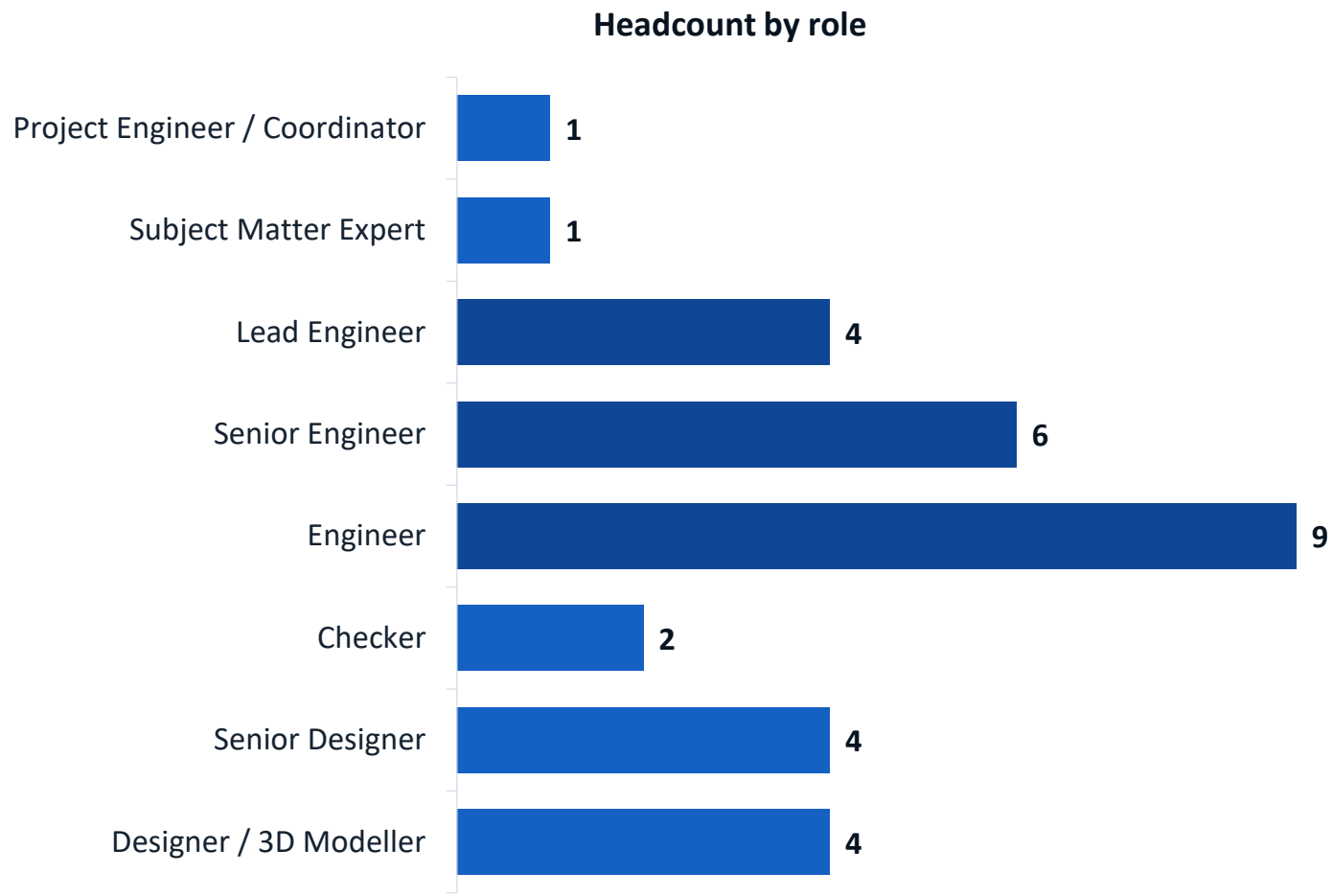
- API RP 2A-WSD
- ISO 19902 / ISO 19901 series
- NORSOK N-001 / N-004
- DNV-ST-N001 (Marine Operations)
- DNV-RP-C203 (fatigue)
- DNV-RP-C205 (environmental loads)
- AISC 360
- Eurocode 3

Engineering Resources

31

Engineering Pprofessionals

2	Management & coordination
19	Engineering
10	Checking, design & drafting



ABYSSAL TECHNOLOGIES

Quality Built in at Every Stage

30%

Concept review

Design basis, model philosophy, loads and criteria agreed

60%

Analysis review

Model checks, analysis results, member and joint utilisations

90%

Design review

Reports and drawings checked; constructability review

100%

Final verification

Independent check, code compliance and lessons learned

Independent reviews, constructability checks, compliance verification and lessons-learned integration ensure quality deliverables — on time and right first time.

We are In process of Acquiring : ISO 9001:2015/ISO 45001:2018 Expected to Receive Certificate by End December 2026

Why Clients Choose Abyssal

North Sea experience

Johan Sverdrup and Dogger Bank South, to NORSOK and DNV requirements

Advanced nonlinear analysis

Pushover, ship impact and collapse studies beyond linear code checks

USFOS & GRLWEAP expertise

Structural collapse and pile driveability handled by one team

End-to-end asset support

One partner from concept and design to life extension and removal

Scalable resource model

Teams that scale with your project schedule and workload

Client-focused delivery

Senior-led teams and a single point of contact

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ENGINEERING BEYOND DEPTHS

Partner with Abyssal Technologies

Design · Verification · Integrity · Installation · Life Extension · Decommissioning

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