Delivering operator services in Offshore Wind Farms

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Agenda

1 Overview of SGRE

2 The vision for Offshore Wind sites

3 SGRE scope of supply

4 Case studies in action

5 Q&A

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As number 1 in the Offshore market, we have the knowledge to maximise investment

Offshore

- Committed with customers point of view, from absolute safety to maximizing returns
- We strive to lead the offshore industry in delivering a lower of cost of energy
- The offshore partner of choice, leading player in the industry

Key Facts and Figures

- 18.7GW installed worldwide
- Proven track record
- More than 30 years experience in the offshore wind power industry

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Focusing on Northern Europe & Middle East

SGRE Footprint

Present in 24 countries

Over 28GW under our operations

12GW of this in Offshore Operations

SGRE Logistics

8 Service Operations Vessels

19 Crew Transfer Vessels

5 Helicopters

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The vision for Offshore Wind Sites

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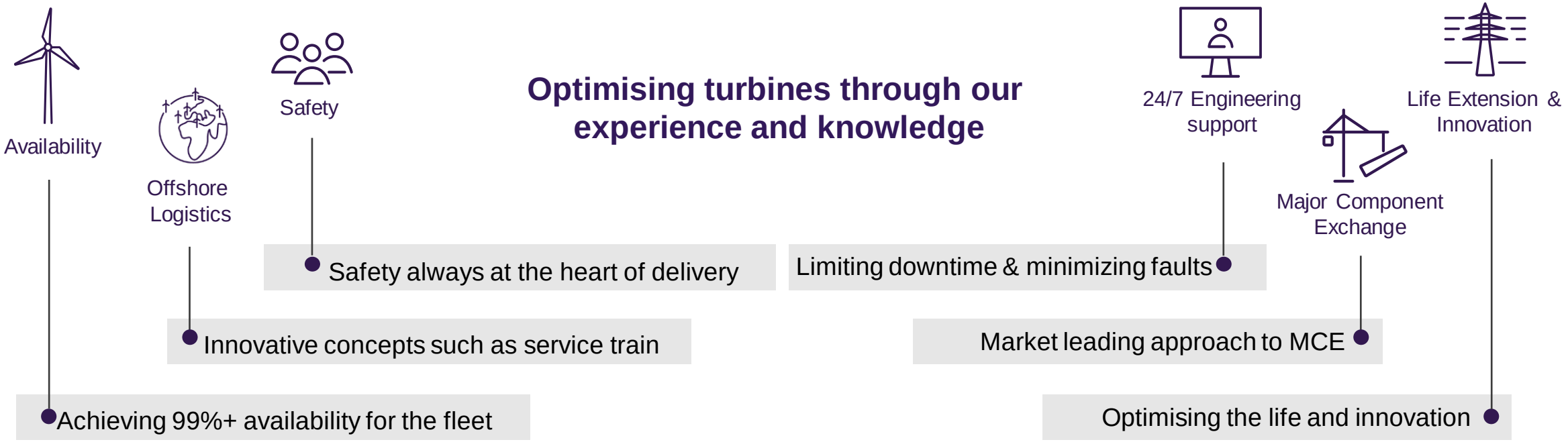
Offshore wind plays a key role in the future net carbon zero world, SGRE aims to help maximise the returns, economic and environmental, for our customers



Ensuring wind farms can operate and deliver the optimal output for our customers

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Our core for converting Big Data into value to customers

- Reduced downtime and optimized production by fast remote response
- Improved onsite first-time fix rates by analytics and advices to site
- Optimized maintenance strategy, reduced risk and operational expenditure by predictive methods

>35,000
globally monitored wind turbines

>85%
of issues can be resolved remotely

24/7
center manned all day – every day

>200 GB/day
received data from numerous sensors

>99%
of serious component failures detected in advance

7 Remote Operations Centers
Located in Brande, Newcastle, Pamplona, Redhills, Orlando Ciudad de Mexico, Österronfeld

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Delivering major component exchanges whilst maintianing safety and minimising downtime

Significant experience in handling complex major component exchanges with constant focus on safety

SGRE have a dedicated team working in-depth with Jack Up vessels as jacking operations planned well in advance can reduce the costs significantly.

- Dedicated Jack-Up fit for service purpose to serve platforms **G2, G3, D6, D7 & D11**
- Secure a safe, competitive and effective solution
- Secure shorter lead times and time needed per event
  - Availability of a vessel
  - Proactive planning and preperation
    - Known vessel
    - Seabed surveys as site-condition differences is significant (low/deep water/ seabed, weather)
    - Leg penetration analysis
    - Documentation
    - Lifting plans
    - Ability to work unrestricted
  - Fewer mobilisations and less time for same needed
  - Bundling of events
  - Focus on operational/performance criteria (jacking, transit, survival, craning)

First mover in order of reducing cost and overall lead time and an experienced partner

- First long term charter in the market
- Partnership agreement with our biggest offshore customer – vessel sharing agreement and vessel lease agreement for combined + 4 years
- **SGRE (Service) have had long term charters in place for the last +5 years executing +45 major component exhanges per year adding up to more than 220 major component exchanges over a 5 year period**

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How can Life Extension benefit your business?

We give you:

- Upgraded turbine until year 30
- Availability guarantee and a fixed price
- 10 more years of income
- Low-cost and low-risk alternative

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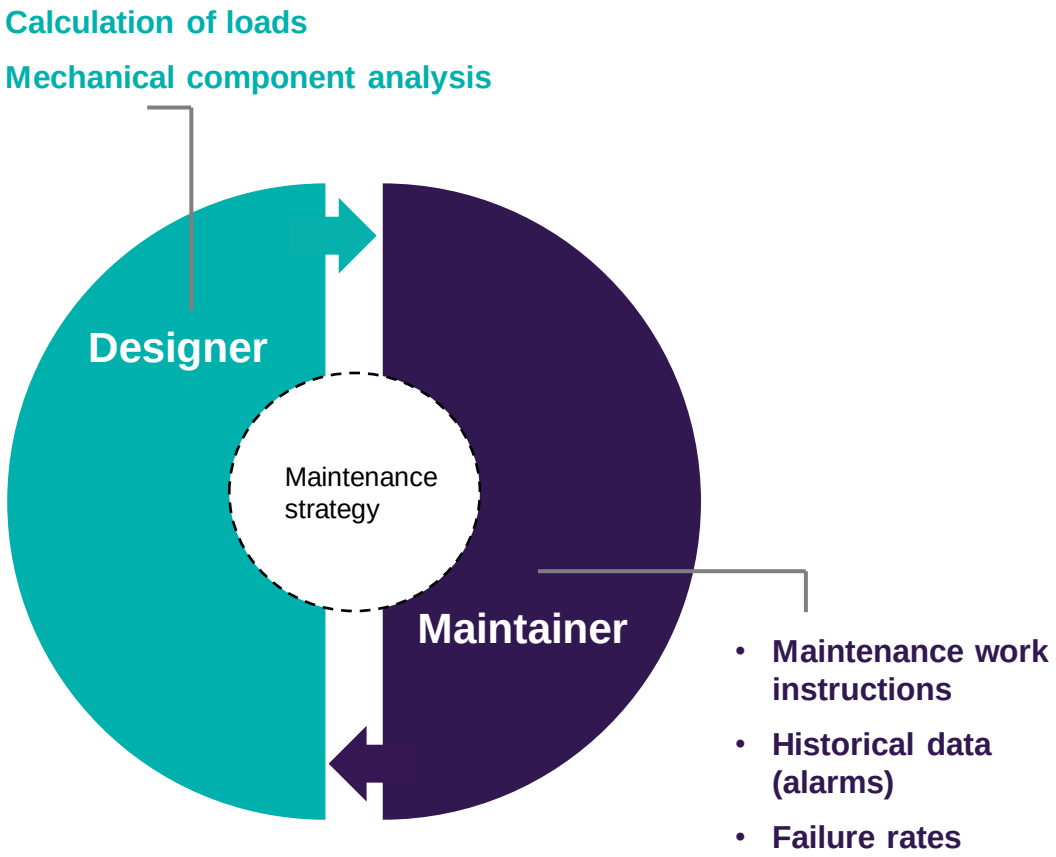
The perfect combination of a designer and maintainer

As turbine designer we have know-how, combined with operation and maintenance experience of more than 74 GW.

It provides unique capabilities that you can benefit from:

- Owners of aeroelastic model and wind turbine control to provide reliable loads
- Owners of 3D CAD models and FEM* in order to provide reliable reinforcements
- Wind turbine control development capability
- Mechanical upgrades design capability
- Worldwide fleet failure rate
- Broad experience of behavior and predictive analysis
- Flexible and customized O&M contract



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SGRE Scope of Supply

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We have a vision for Offshore

Siemens Gamesa aims to be a full turnkey provider for our customers

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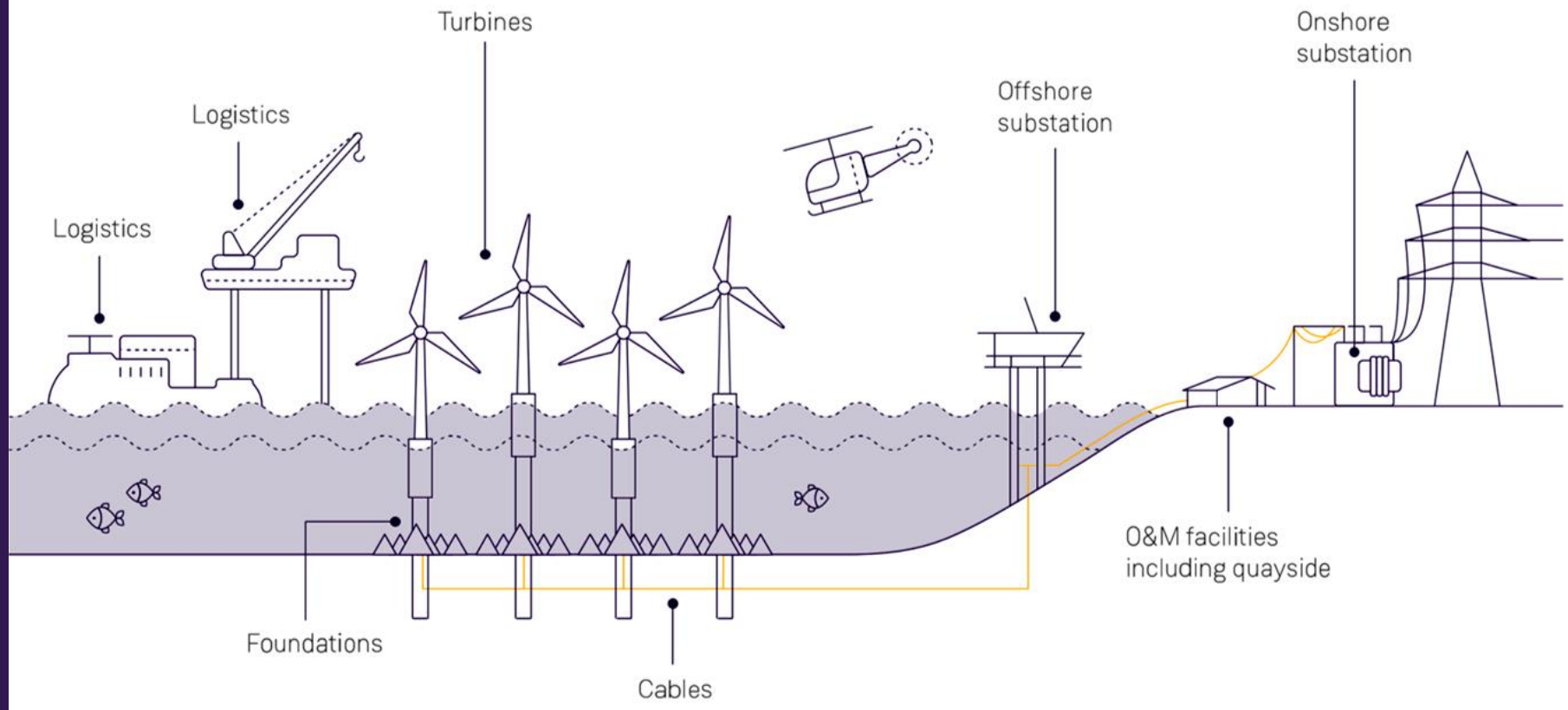
Turnkey solutions

Siemens Gamesa can do all inspections and scheduled maintenance of BoP above and below water. Incorporate it to AW and reduce risk interfaces for you and we can discuss management of 0&M facilities, asset management, energy trading to tailor made for your wind farm.



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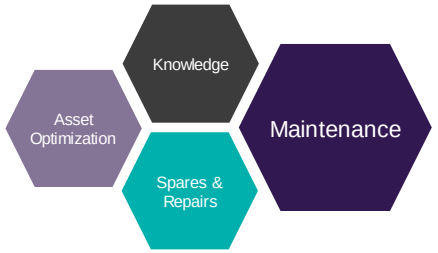
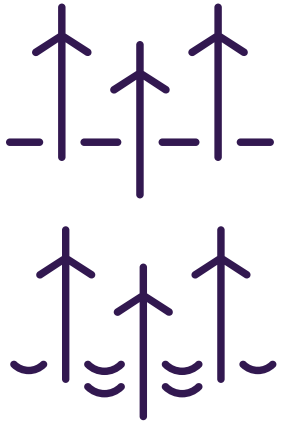
Balance of Plant Services





Challenge

Both onshore and offshore wind farms are much more than just the wind turbines. Managing the entire balance of plant to secure high performance and safe operations is a complex and challenging job that requires management of many tasks and stakeholders.

Solution

Electrical Balance of Plant: Scheduled maintenance and minor correctives on wind turbine switchgear, inter-array grid and substation.

Civil Balance of Plant: Scheduled maintenance and minor correctives.

Wind Farm Asset Management: Financial asset management, weather and energy forecasting, power trading supplier management, stakeholder management, extended wind farm availability.

Operations Management: Base and site management, grid integration, emergency rescue standby (offshore only), waste management, customs assistance.

Benefits

A trusted partner with a long track record to take care of the entire wind farm balance of plant, to ensure synergy, safety and high performance of your assets.

Safety | Maintenance | Performance | Trusted partner

Technical know-how

Rely on Siemens Ganesa's experienced personal to plan and coordinate on-site activities.

Applicability

All Siemens Gamesa wind turbines and oOEM within a Siemens Gamesa operations and maintenance contract.

Fleet experience

Long track record of successful operations and maintenance of Balance of Plant Services globally – both onshore and offshore

Performance and safety

Siemens Gamesa provide a Balance of Plant Services with focus on high performance and safety

Modularity

The Balance of Plant Services can be tailored to meet customer's project-specific needs

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Deliver for customers now & beyond the end of life date

Transition Period up to 2026	Project Operation and Maintenance	Maximising project AEP and lifetime
• Partnership to develop solid return on investment • Clear understand of Contract Agreement and Contract Schedules for large scale offshore operation and maintenance • Optimal provider to enable bankability of the project • Leading offshore provider gives us the scale to optimise cost base • Innovative approach for turnkey and hydrogen	• Largest offshore fleet in the world • OEM knowledge to identify issues quickly and minimise downtime • Digitialization to ensure you as the customer have full visibility of performance • Full turnkey responsibility reduces interfaces and project risk	• OEM knowledge critical to enable lifetime extension • Capability to perform load assessments and give technical and engineering support required to secure certification • Focus on upgrades demonstrated by recent innovations such as Power Boost / Wake Adapt • Business case becomes more attractive giving greater opportunities to secure investment

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Case Studies in Action

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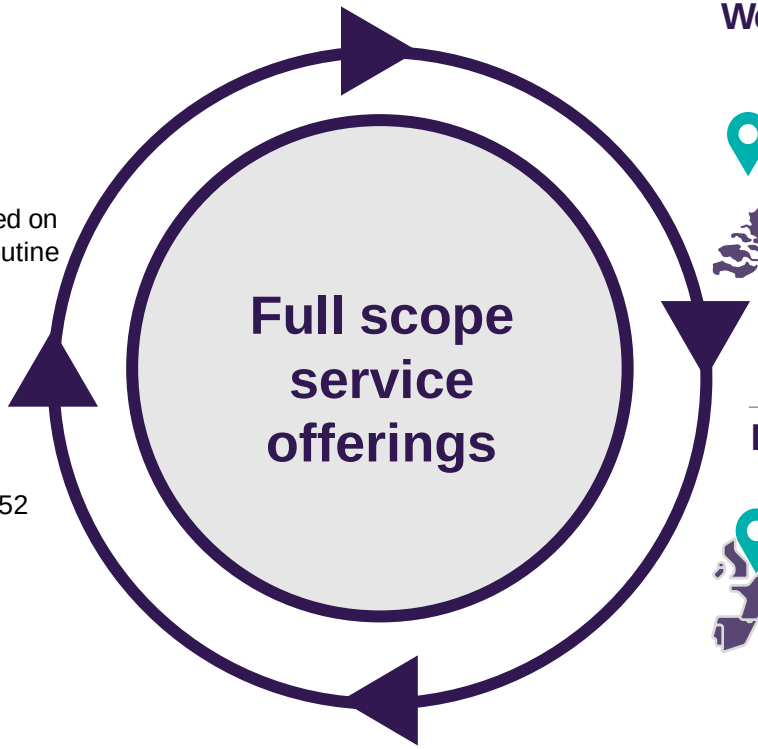
Turnkey solutions Project reference

Lynn and Inner Dowsing

Turbine Type	SWT-3.6-107
Number of Turbines	54
Service scope	Full scope LTP BoP mainly focused on inspections and routine maintenance

Trianel

Turbine Type	Senvion 6.3M152
Number of Turbines	32
Service scope	Full scope LTP



Westermeerwind

Turbine Type	SWT-3.0-108
Number of Turbines	48
Service scope	Full scope LTP Foundations, cabling & Onshore substation

Fryslan

Turbine Type	SWT-DD-130
Number of Turbines	89
Service scope	Full scope LTP BoP mainly focused on inspections and routine maintenance

Siemens Gamesa can do all inspections and scheduled maintenance of BoP above and below water. Incorporate it to AW and reduce risk interfaces for you and we can discuss management of 0&M facilities, asset management, energy trading to tailor made for your wind farm.

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Delivering full turnkey scope at LID since Apr 2017 - A proven new partnership model for offshore wind farms

LID Facts

54wtg x SWT-3.6-107

Base: Grimsby

Distance: 30nm

Built: 2008-09

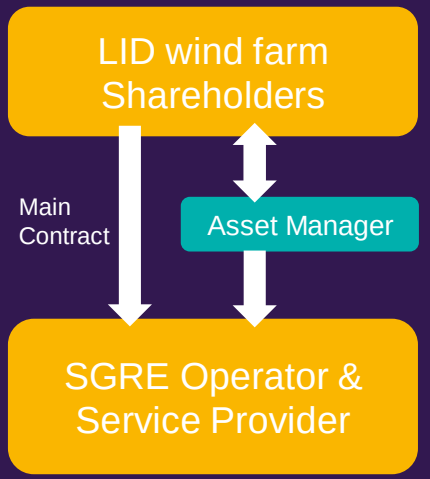
Term: 10 years

Logistics: CTV

Principles of how we operate

- Operate as One Team – Partnership
- Full Ownership of Duty Holder responsibilities
- Act in best interest of the asset

Scope in Action



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We have a proven transition to the operator role

Harnessed the knowledge & capability of the Centrica team

12 month detailed transition plan, clear milestones & phasing Collaborative approach throughout with all employees in scope for TUPE

Reassurance through Operational Readiness day 1 planning & dry run activities

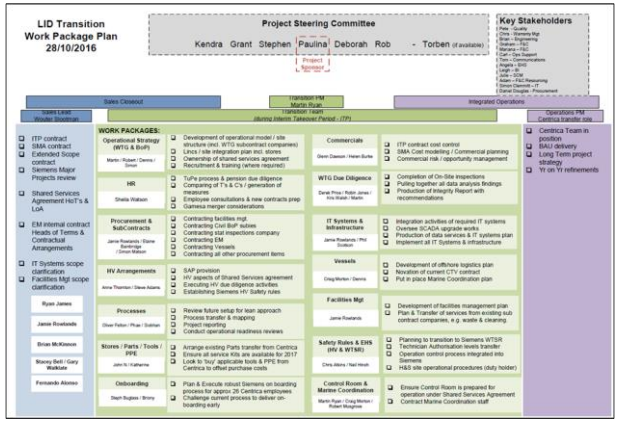
Transition PM leading the change

Understanding current best practice processes which feed into future operating model

Routine progress reporting on preparations with a key focus on operational risks to deliver a smooth transition.

Clear phasing and detailed tasks manged through a transparent project plan

Detailed work package plan used to control all aspects of the transition



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Capable & multi-skilled Control Room is at the heart of our Operations at LID

SERVICES

Marine Control

Operational Control

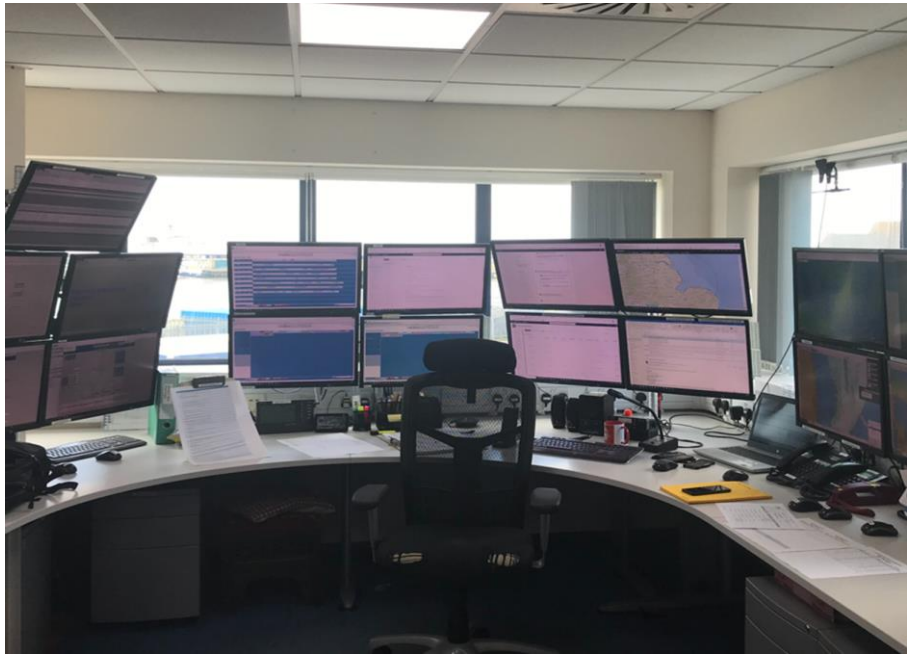
Emergency Response

Asset Monitoring

Substation Monitoring

Extend service to other projects

- Up-skilled & Cross-skilled control room operators
- Emergency drills in conjunction with Emergency Services & Coast Guard
- Vessel audits and management in conjunction with OSL team
- Direct coordination of GRID responses & fast dispatch of standby HV specialists
- Enhanced fault response working in partnership with our Diagnostic Centers



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Delivering Safe, Compliant and Responsive HV services at LID

Our HV track record on LID

SGRE, together with a tier 1 HV contractor, provide a robust, responsive and innovative service provision.

- HV Safety rules management & control
- Dedicated & integrated HV resources with clear contingency arrangements
- Onshore substation in scope
- Written scheme of examination for HV assets reducing downtime

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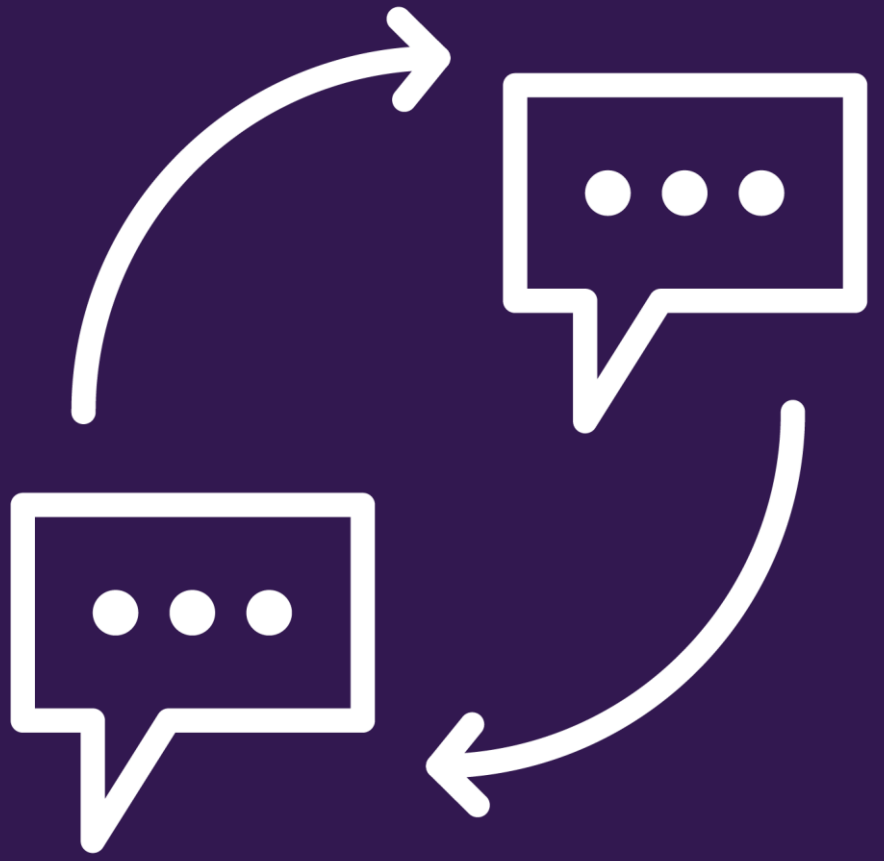
Q&A



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Thank you!

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