Renewables Webinar
21st September 2022

Lifting Equipment Engineers Association

www.leeaint.com

Training Requirements and Operational Management

Darragh Hickey
Managing Director, Prolift Handling Ltd

Lifting Equipment Engineers Association

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PROLIFT HANDLING LTD

Prolift Presentation

Training Requirements and Operational Management

PROLIFT HANDLING LTD

Topic to be Covered

- Brief Introduction
- Training Requirements
- Overview of Equipment in Turbines
- Discuss operation of project
- Q&A at end of session

Introduction

- Darragh Hickey – Managing Director Prolift Handling
- Established in 2013
- Largest Supplier Lifting, Material Handling, Height Safety Equipment in Ireland
- Prolift are members of LEEA and ISO 9001:2015 Accredited
- A team of 10 service engineers all of whom are LEEA Trained
- Have the contract to carry out thorough examinations of Lifting and Height safety equipment in off-shore Turbines for GE Energy

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Training Requirements

Training Requirements

GWO – Global Wind Organisation

- Training standards for a safer and more productive workforce
- Non-profit Body founded by the industry
- GWO standards are created by the industry, for the industry.
- Members are globally leading turbine manufacturers and owners
- Members collaborate and identify work activities where the creation of standardised training can enhance safety for technicians

Training Requirements

Mandatory Courses

- GWO Sea Survival & Boat Transfer– 1 Day (€500)
- GWO Manual Handling – ½ Day (€160)
- GWO Fire Awareness – ½ day (€195)
- GWO Working at Height – 1.5 days (€525)
- GWO First Aid – 1 day (€330)

Total days 4.5 at a cost of €1700

- Courses to be Renewed every 2 years

- Refresher courses less expensive but not much saving on duration of course

Training Requirements

GLOBAL WIND ORGANISATION

Global Wind Organisation

WINDA Course Participant Training Certificate

WINDA ID
CC082001IE

Course Participant Name
Ciaran Clarke

Training certificate generated on 2022-09-15 13:23 UTC +00:00

Course Title	Course Code	Training Provider	Country	Completion Date	Valid From	Valid Until	Status
Sea Survival	SS	Errigal Training Centre	Ireland	2021-11-15	2021-11-15	2023-11-15	Current
Fire Awareness	FAW	Errigal Training Centre	Ireland	2021-11-17	2021-11-17	2023-11-17	Current
Working at Heights	WAH	Errigal Training Centre	Ireland	2021-11-17	2021-11-17	2023-11-17	Current
First Aid	FA	Errigal Training Centre	Ireland	2022-02-25	2022-02-25	2024-02-25	Current
Manual Handling	MH	Errigal Training Centre	Ireland	2022-02-25	2022-02-25	2024-02-25	Current

Training Provider	Country	Address
Errigal Training Centre	Ireland	Unit 3 Ballyconnell Industrial Estate Falcarragh F92HC95

Certificate Code:803984e3-b955-456c-93b2-89705f943edb
Certificate URL: https://winda.globalwindsafety.org/course-participant/certificate/CC082001IE/803984e3-b955-456c-93b2-89705f943edb

This certificate is a representation of training records in WINDA. We strongly encourage that you always verify training records directly in WINDA. Verify the current training status of delegates by searching WINDA at https://winda.globalwindsafety.org

Training Requirements

Manufacturer/Client Specific Training :

- Various clients request additional training
- Training for specific lift models - Manufacturers
  Zagres Lift, Hailo Lifts
  Hailo Lifts – Germany, 5 days cost around 10k
- Tractel Blocstop Training
- Training for specific lifelines and fall arress styems – Latchway lifelines and ladder systems
- Fire extinguisher Inspection Certificate
- Medical certificate for engineers (no more than 2 years)

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Operational Management

Operational Management

- 2 Service engineers required for each turbine
- Boat drops at turbine and comes back at agreed time
- Normally get 1-2 turbines examined per day
- Duration of inspection varies depending on:
  - Condition of assets – if require repair etc
  - Weather conditions
  - Age of turbines – New turbines have more equipment but have proper lifts
- 7 main steps to planning and accessing the turbines

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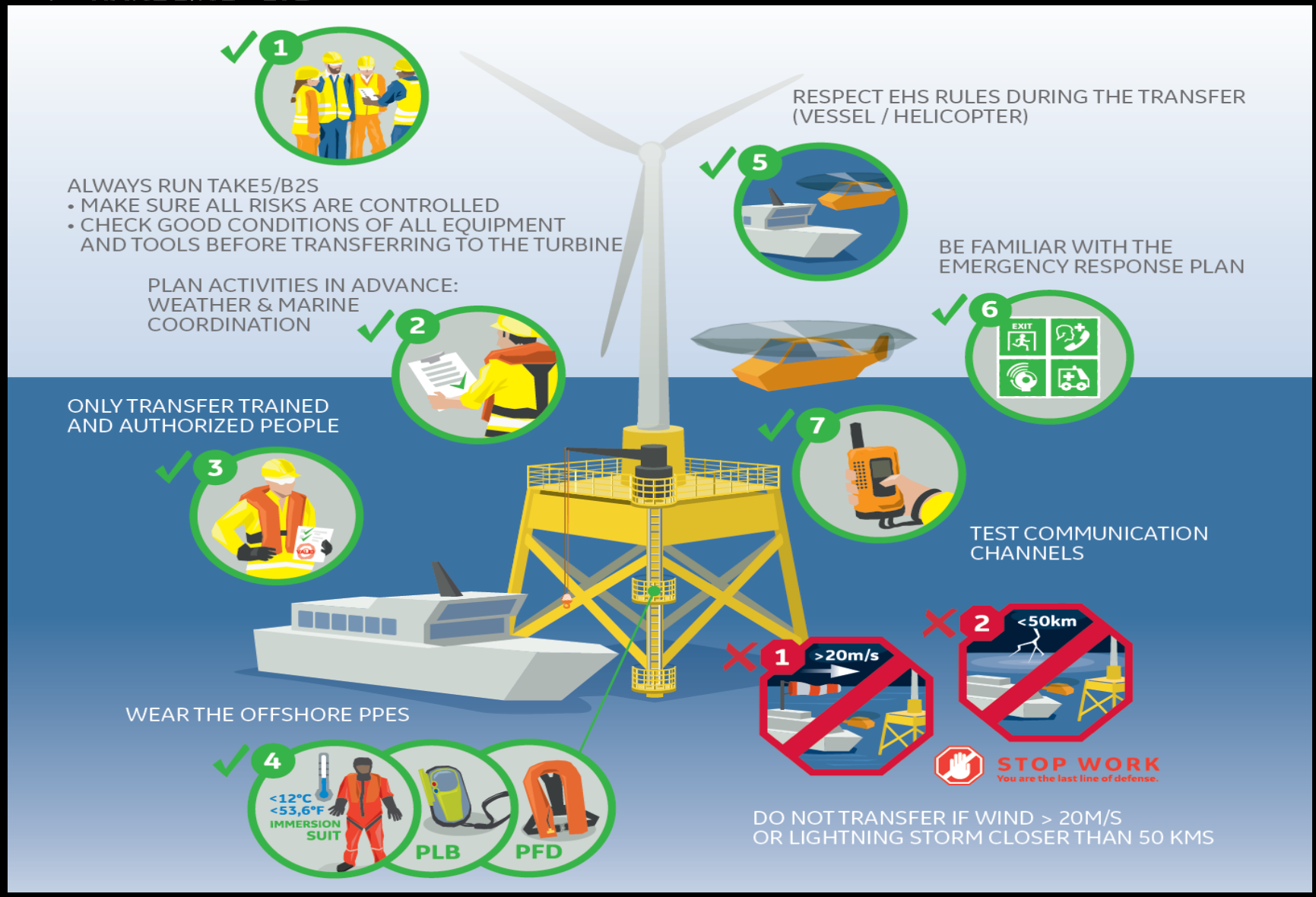
Operational Management



List of Equipment

What Expected to Examine in Turbines:

- Service Lifts
- Ladders
- Safety Lifelines
- Height Safety Equipment
- Electric Chain Hoists
- Davits & Jib Cranes
- Lifting Accessories
- Lifting Points
- Man-riding Anchor Points

Client Dependant

- Fire and Auxiliary Equipment
- First Aid Supplies
- Accumulators/Pressure systems

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List of Equipment

Description	Location	Last Inspec	Next Inspect	Serial No.	SWL	Category	Fre	Job No	Colou
tower CRANE gantry Liebherr-werk TYPE wak280	TOWER 1	20/12/2021	20/12/2022	51642965	max 2t	A FRAME GANTRY	12	19702	Green
15M FALL ARREST BLOCK C/W S/S WIRE ROPE C/W HOOK	TOWER 1	20/12/2021	20/06/2022	14-2453257	N/A	ANCHOR LANYARD	6	19702	Green
ELECTRIC S/F WIRE ROPE HOIST C/W SAFETY HOOK	TOWER 1	20/12/2021	20/12/2022	15311	200KG	ELECTRIC WIRE ROPE	12	19702	Green
WIRE rope hoist Tirak TYPE x1023	TOWER 1	20/12/2021	20/12/2022	1426	980kg	ELECTRIC WIRE ROPE	12	19702	Green
STRUCTURE MOUNTED LIFELINE C/W BOW SHACKLE	TOWER 1	20/12/2021	20/06/2022	T1A	250KG	FALL ARREST EQUIPM	6	19702	Green
STRUCTURE MOUNTED LIFELINE C/W BOW SHACKLE	TOWER 1	20/12/2021	20/06/2022	T1B	250KG	FALL ARREST EQUIPM	6	19702	Green
FABX2-15CS FALL ARREST BLOCK C/W S/S SWIVEL INDICAT	TOWER 1	20/12/2021	20/06/2022	194053658	NO SWL	FALL ARREST PPE	6	19702	Green
BOW SHACKLE	TOWER 1	20/12/2021	20/06/2022	T33	6.5 TON	SHACKLE	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1E	1 PERSON	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1H	1 PERSON	STEP LADDER	6	19702	Green
TOWER LADDER WITH FALL ARREST RAIL HACA system	TOWER 1	20/12/2021	20/06/2022	TL1	N/A	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1F	1 PERSON	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1B	1 PERSON	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1C	1 PERSON	STEP LADDER	6	19702	Green
LADDER c/ W HACA system	TOWER 1	20/12/2021	20/06/2022	TL1A	1 PERSON	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1D	1 PERSON	STEP LADDER	6	19702	Green
LADDER	TOWER 1	20/12/2021	20/06/2022	TL1G	1 PERSON	STEP LADDER	6	19702	Green
THERN SWING JIB CRANE MODEL 5PT10S	TOWER 1	20/12/2021	20/12/2022	5017-91459	max 150kg	SWING ARM JIB	12	19702	Green
THERN SWING JIB CRANE MODEL 5PT10S	TOWER 1	20/12/2021	20/12/2022	5017-91456	max 150kg	SWING ARM JIB	12	19702	Green

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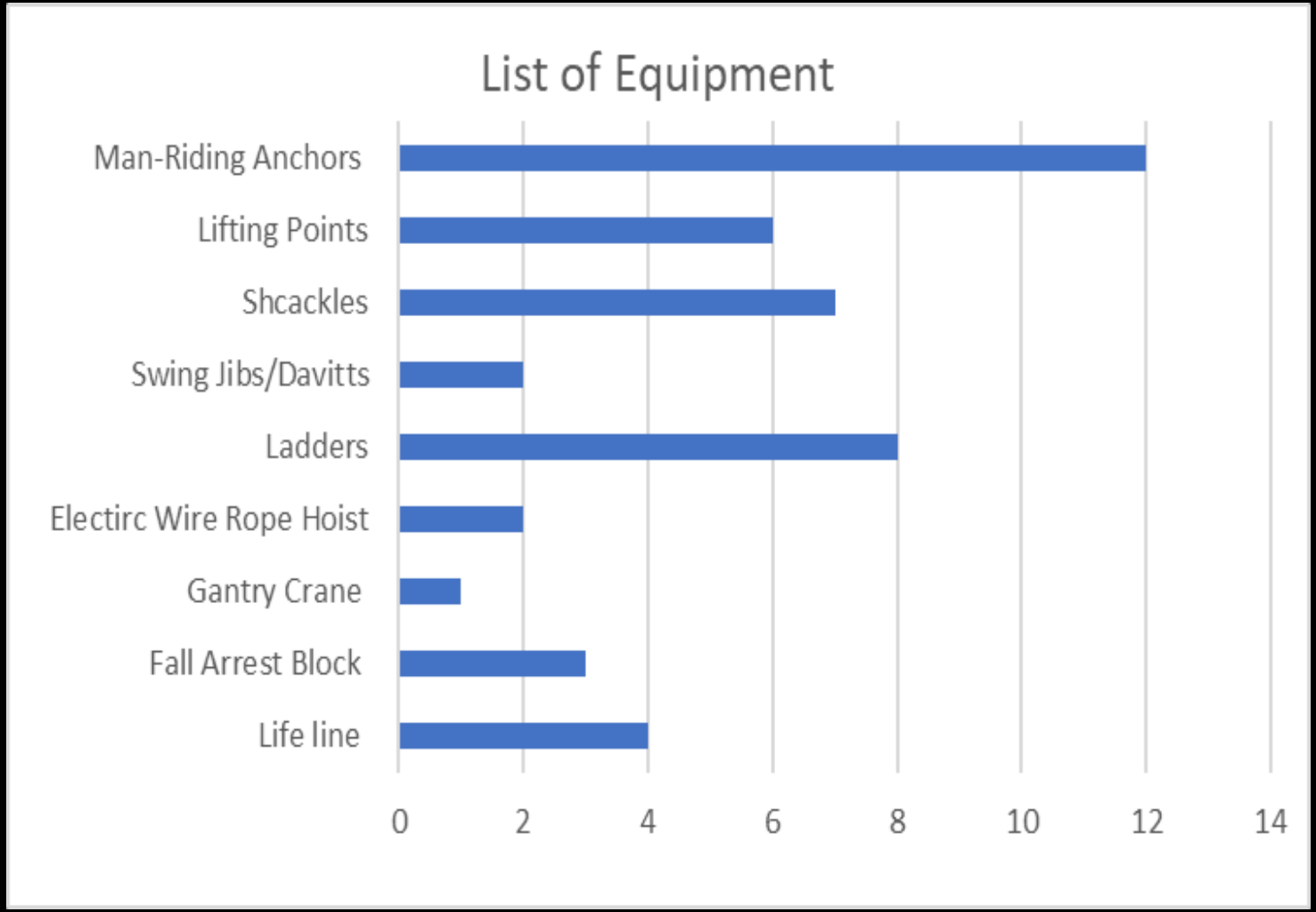
List of Equipment



Operational Management

Turbines we inspect are 20 years old

- Much smaller – 40/50 assets
- No Service Lifts

Modern Turbines Considerations

- The Hailo/Zagres Service Lift system - Needs to be stripped, inspected and measured and reassembled as per manufacturers requirements and this done correctly takes 3 hours.
- 80mtrs of latchway ladder must be inspected that the lift runs on which again eats up time taking up to an hour. Engineer must climb to inspect
- New land turbines have 90-120 assets on for inspection – Far more than older offshore turbines

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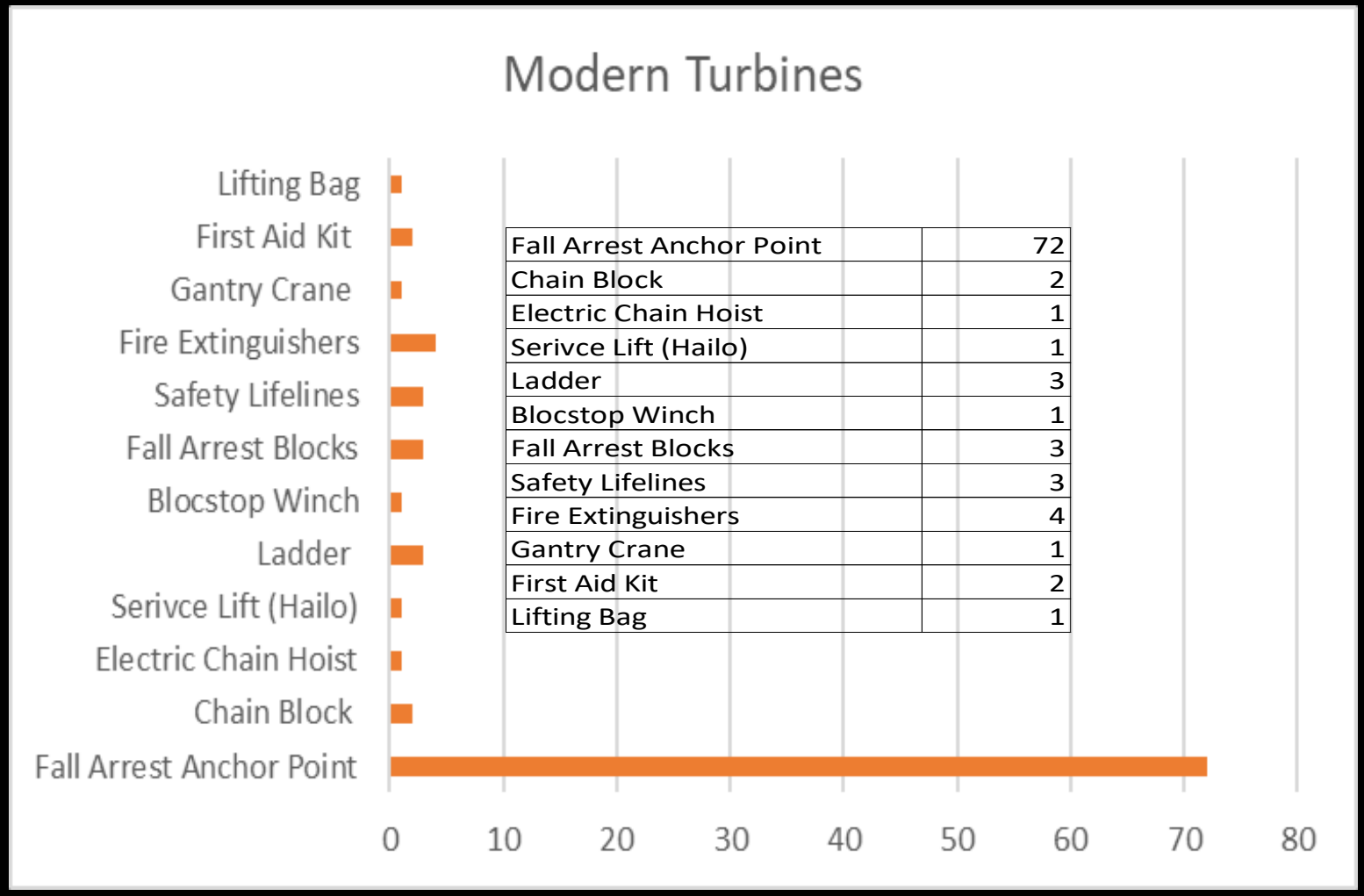
List of Equipment



Fall Arrest Anchor Point	72
Chain Block	2
Electric Chain Hoist	1
Serivce Lift (Hailo)	1
Ladder	3
Blocstop Winch	1
Fall Arrest Blocks	3
Safety Lifelines	3
Fire Extinguishers	4
Gantry Crane	1
First Aid Kit	2
Lifting Bag	1

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Operational Management

SA I - Checkliste Winde / checklist Hoist

Rev. 2016-11

Kunde: customer:		**Monteur:** technician:	
Windentyp: hoist type:		**BetrSt. /Baujahr:** OpHrs / year of manufacture:	
Seriennummer: serial number:		**Motornummer:** engine number:	

Verschleißteile wear parts	**Prüfkriterium** Test criteria	i.O. OK	n.i.O not OK
Winde allgemein hoist general	Zustand/Dichtheit/Funktion Status/leak/tightness/function	☐	☐
Gehäuse housing	Zustand / Brüche status / damage	☐	☐
Motorbremse engine brake	Bremslüftspalt / Brake clearance measured: _____ Rotorstärke / rotor thickness measured: _____	☐	☐
Fliehkraftbremse centrifugal brake	Beschädigung / Verschleiß damage / wear limit measured: _____	☐	☐
Passfeder-Fliehkraftbremse key-centrifugal brake	Zustand/ Beschädigung Status / damage	☐	☐
Lager bearings	Zustand / Laufgeräusche / thermische Belastung Status / unusual running noise / thermal stress	☐	☐
Plastik-Seilführung rope guide	Zustand / Abrieb status / abrasion	☐	☐
Andrucksystem pressure system	Zustand / Brüche status / damage	☐	☐
Treibscheibenrille traction sheave	Zustand / Abrieb status / abrasion	☐	☐
Dichtringe sealing rings	Dichtheit leak-tightness	☐	☐
Überlast overload	Funktion / Beschädigung function / damage	☐	☐
Anbauteile (Handrad, Bremlüfthebel) attached parts (handwheel, brake lever)	vorhanden / funktionstüchtig available / functional	☐	☐
Alle Verschraubungen all screw connections	Festigkeit fixity / tightening torque	☐	☐
Funktionskontrolle function check	Notbetätigung Handrad/Handablass/Überlast emergency operation handwheel/manual descent/overload	☐	☐

Bemerkung/remark:

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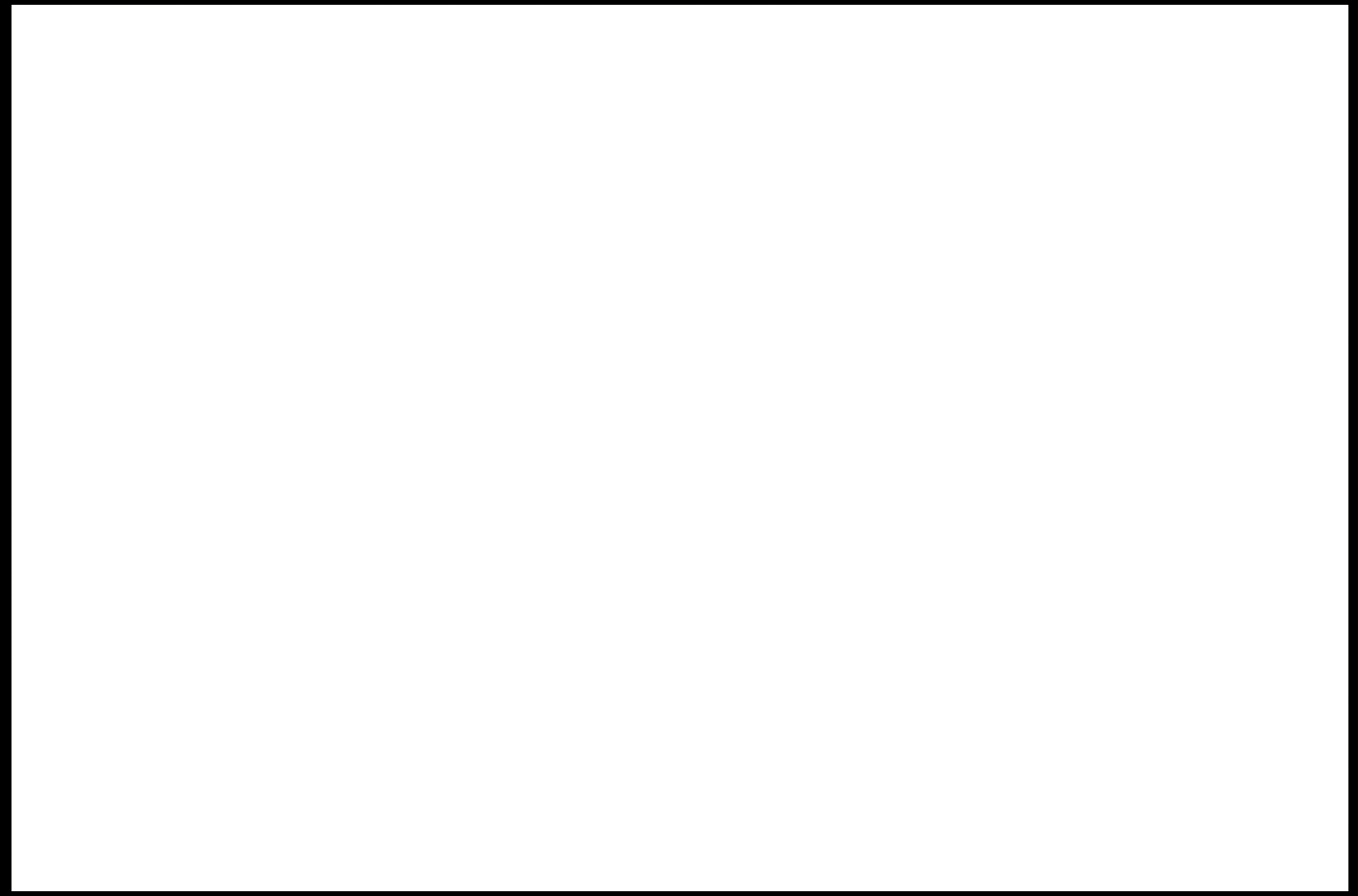
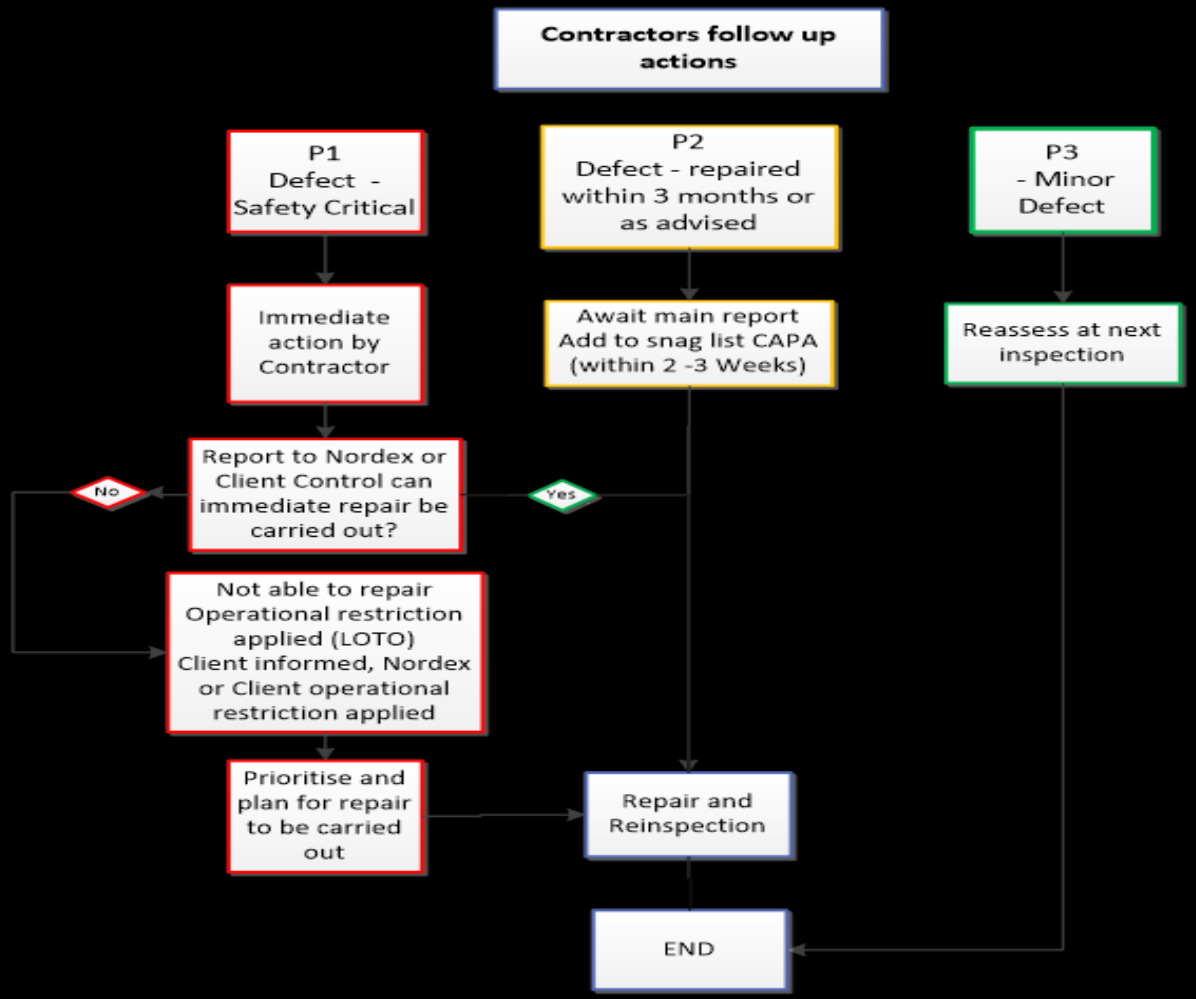
Operational Management



Operational Management

Follow up Actions



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Operational Management

Operational Management

Concerns

- Service can be cancelled on very short notice due to high winds
- Cost of training is expensive – Also loss of revenue for lost days while training
- Only becomes viable if awarded medium term contract
- Service Engineers away from home
- Engineers must be fit, not afraid of heights and good around water
- Dealing directly with owner operators good however maintenance companies try to cut costs
- Some competitors going in more cost effective but quality of service reduces – box ticking

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Any Other Questions

Overview of market and lifting products in wind energy

Raffaello Marino
Key Account Manager, pewag

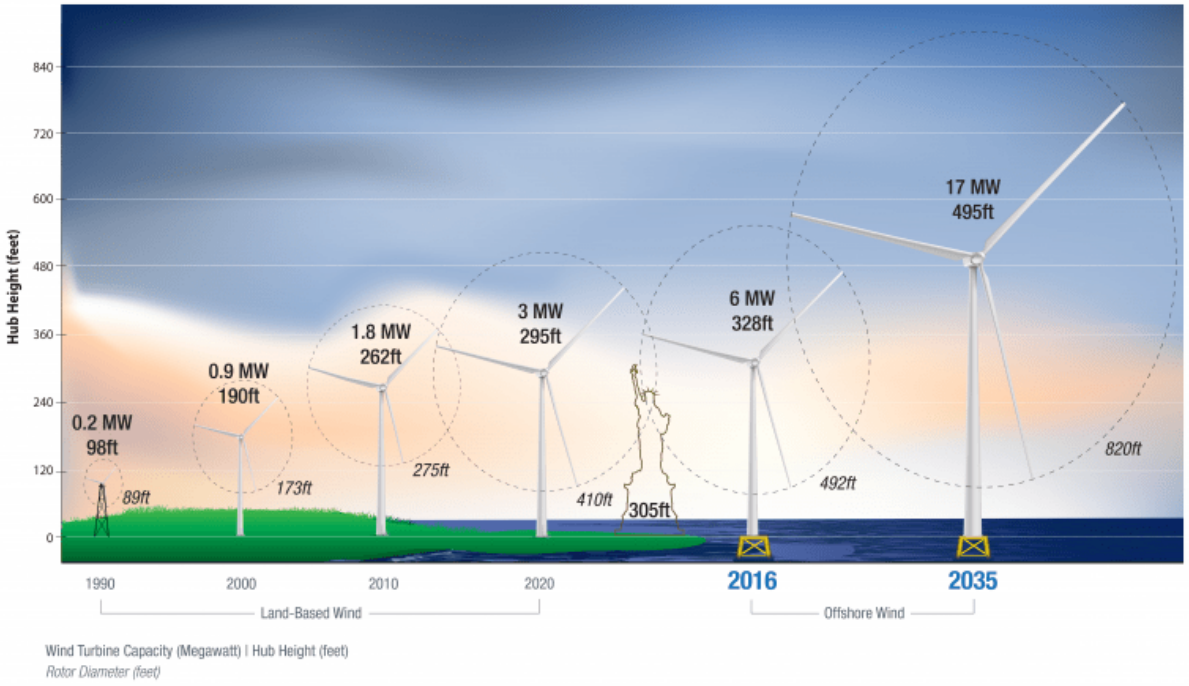
OVERVIEW OF MARKET AND LIFTING PRODUCTS IN WIND ENERGY

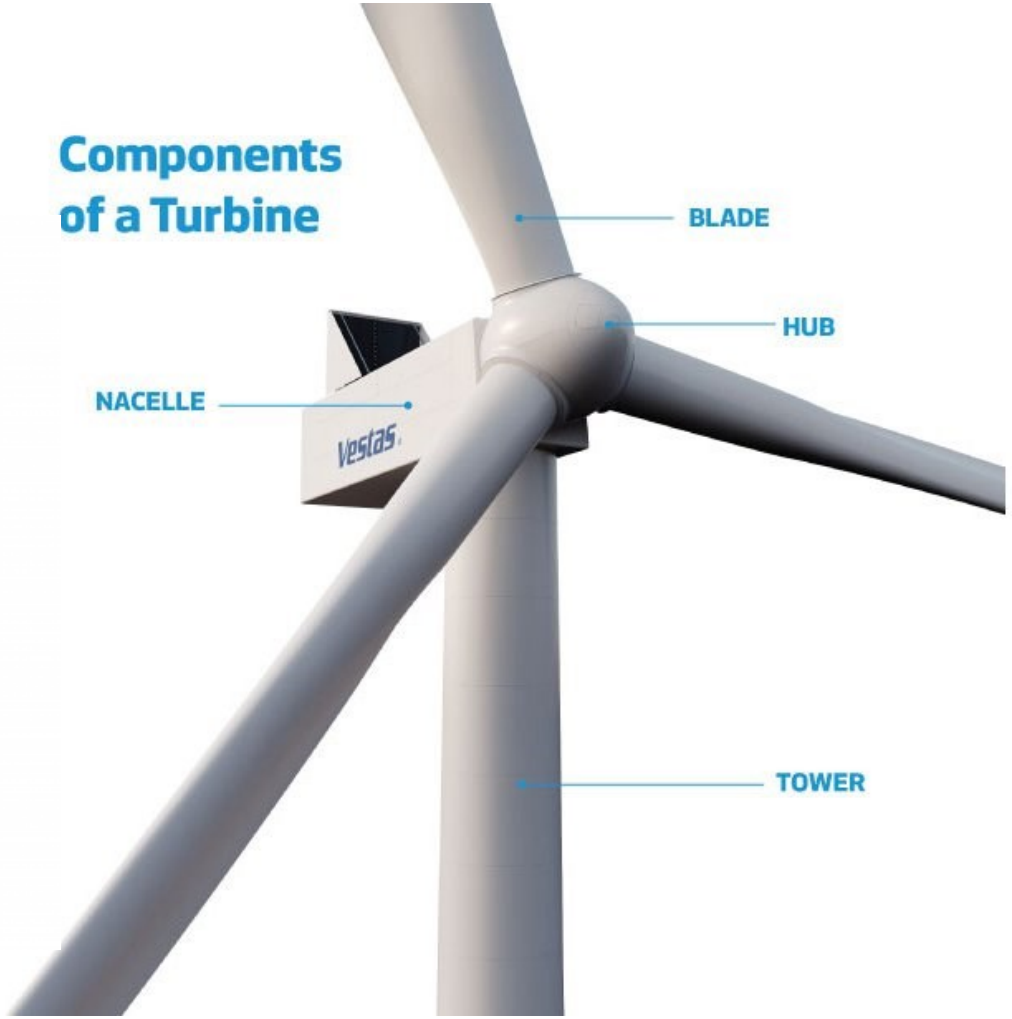
AGENDA

- Wind turbine technology
- Wind Energy Market Overview
- Industry requirements
  > What lifting and lashing equipment is used?
- Q/A

WIND TURBINE TECHNOLOGY

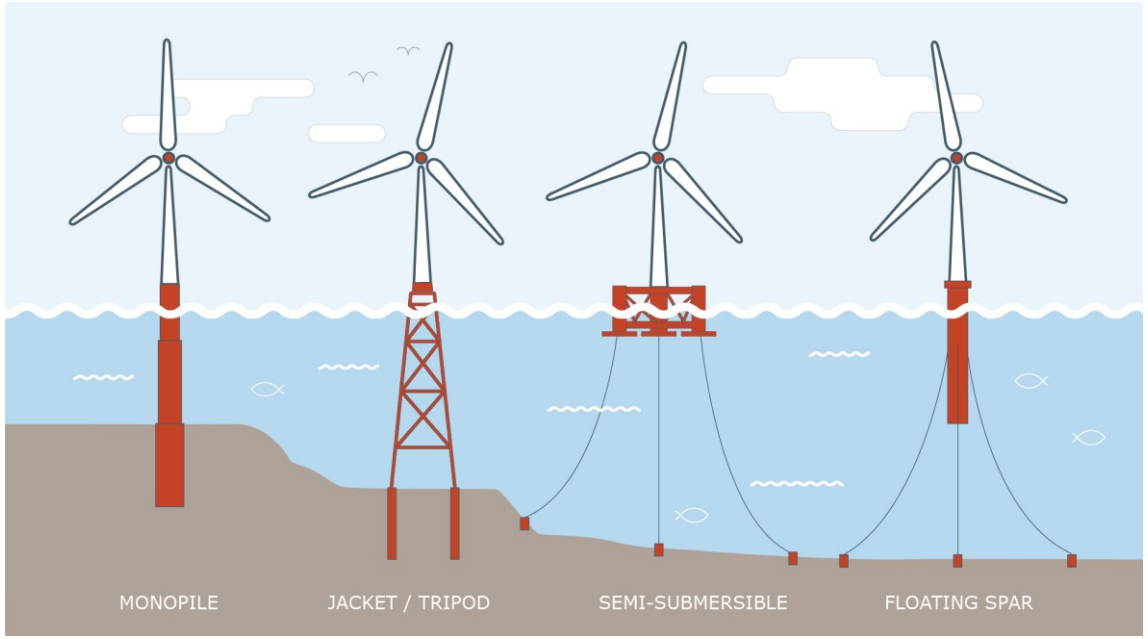
ONSHORE VS OFFSHORE



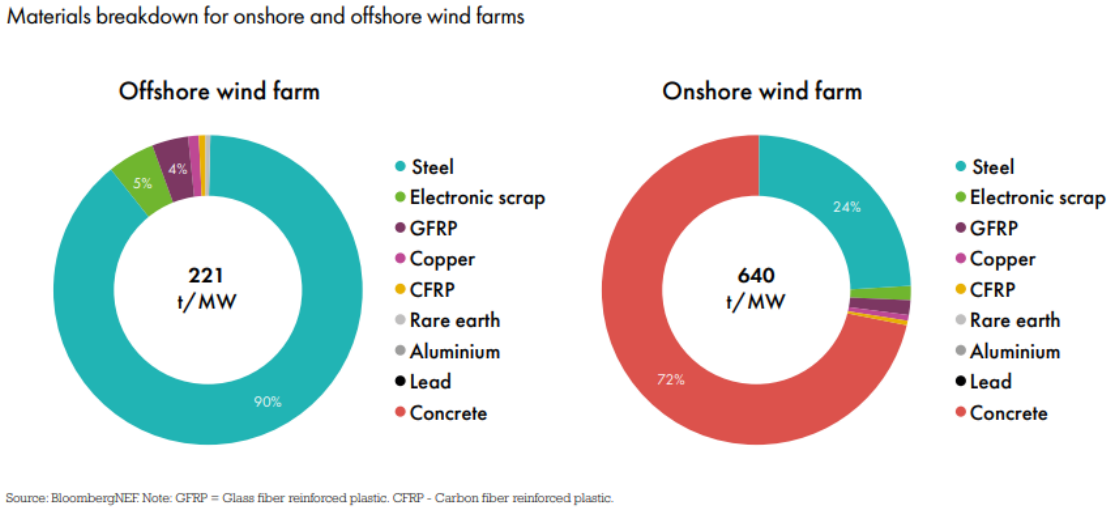


DIFFERENT TYPES WIND TURBINES

FLOATING VS FOUNDATION



MOSTLY MADE OUT OF STEEL



GLOBAL MARKET STATUS

- Wind generated 6.6% of the world's electricity in 2021
- World cumulative wind power capacity is currently 837 GW
- In 2021, 93.6 GW of new installations were added globally

Market Snapshot

Study Period:	2019-2027
Base Year:	2021
Fastest Growing Market:	Asia Pacific
Largest Market:	Europe
CAGR:	15.86 %

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RELEVANT INDUSTRY REQUIREMENTS

LIFTING AND LASHING EQUIPMENT

Tower Production

- Lifting Points
- Grade 80/100/120 Chain slings
- Polyester slings
- Beams/Trolleys
- Special Clamps
- Anchor points for PPE
- Mooring chain
- Stainless Steel chain and fittings
- Shackles

Load Securing Transportation

- Lifting and lashing chains
- Textile lashing straps
- Rotatable lifting points
- Spreader Beams
- Special Clamps
- Weld-on lashing points

Tower Installation

- Lifting and lashing chains
- Textile lashing straps
- Rotatable lifting points
- Spreader Beams
- Special Clamps
- PPE Equipment
- Anchor points
- Load monitoring
- Shackles

Tower Maintenance

- Synthetic tools bag
- PPE Equipment
- Rotatable lifting points
- Hoists/Hoist Chain

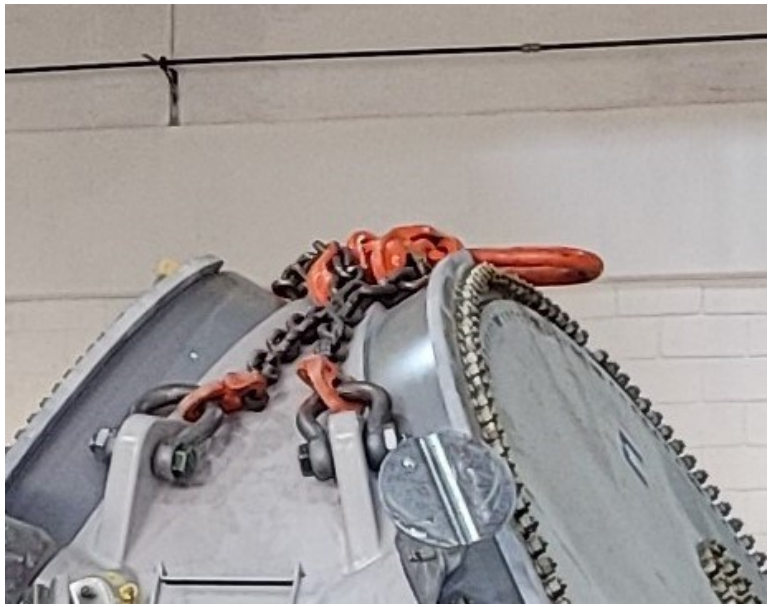
Offshore

- Mooring chain
- Grade 80/100/120 Chain slings
- Stainless Steel chain and fittings

Tower Regeneration

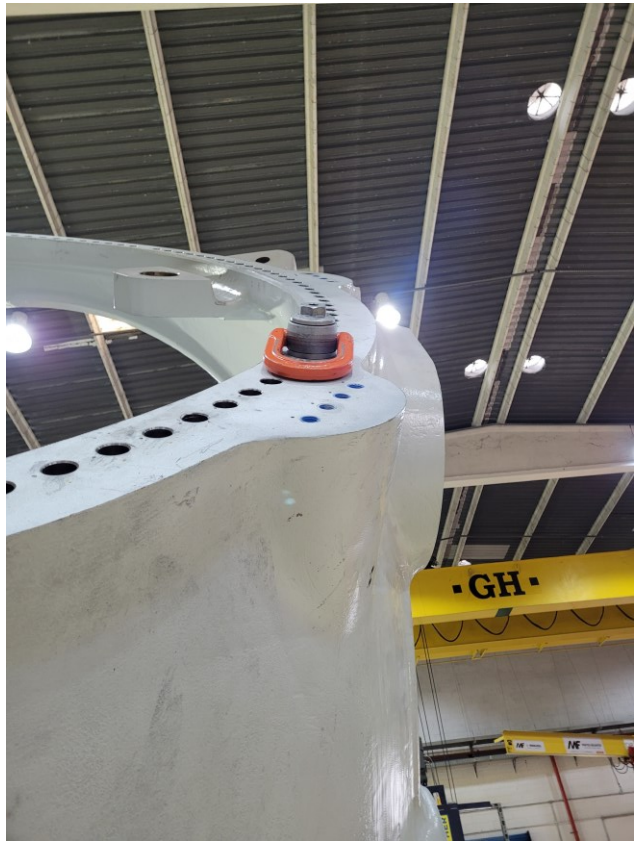
- Lashing chains
- Grade 80/100/120 Chain slings
- Textile lashing straps
- Hoists
- Rotatable lifting points
- Spreader Beams
- Special Clamps
- PPE Equipment
- Load cells

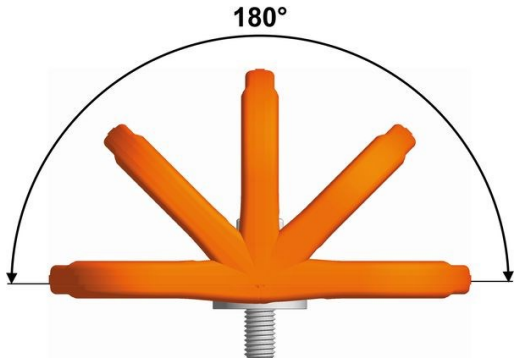
HUB & NACELLES PRODUCTION PROCESS



26mm grade 10 chain sling + connecting links + shackles

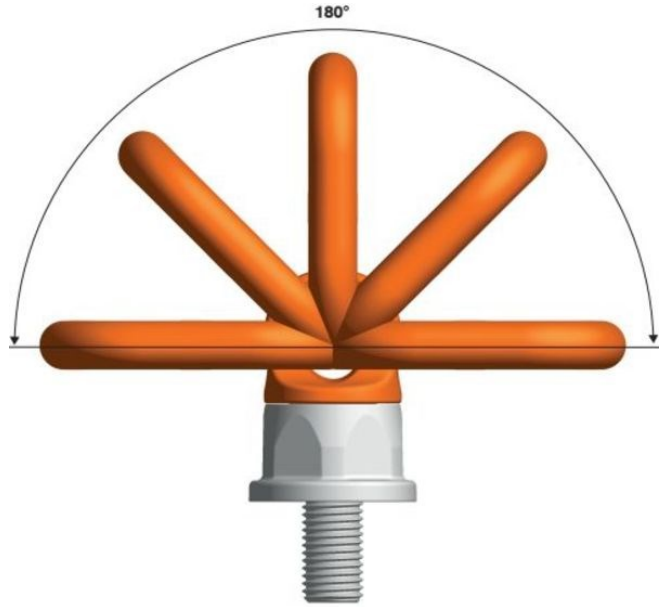
HUB & NACELLES PRODUCTION PROCESS





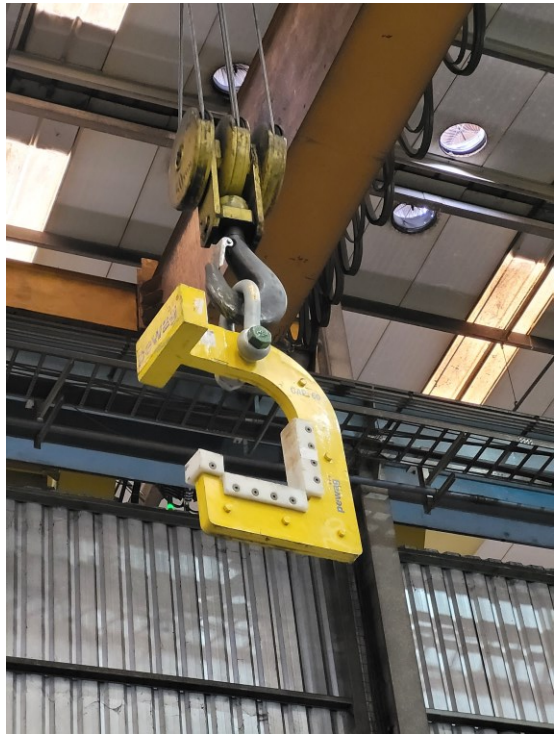
lifting points for handling hubs through production process

HUB & NACELLES PRODUCTION PROCESS



lifting points used in different applications

HUB & NACELLES PRODUCTION PROCESS

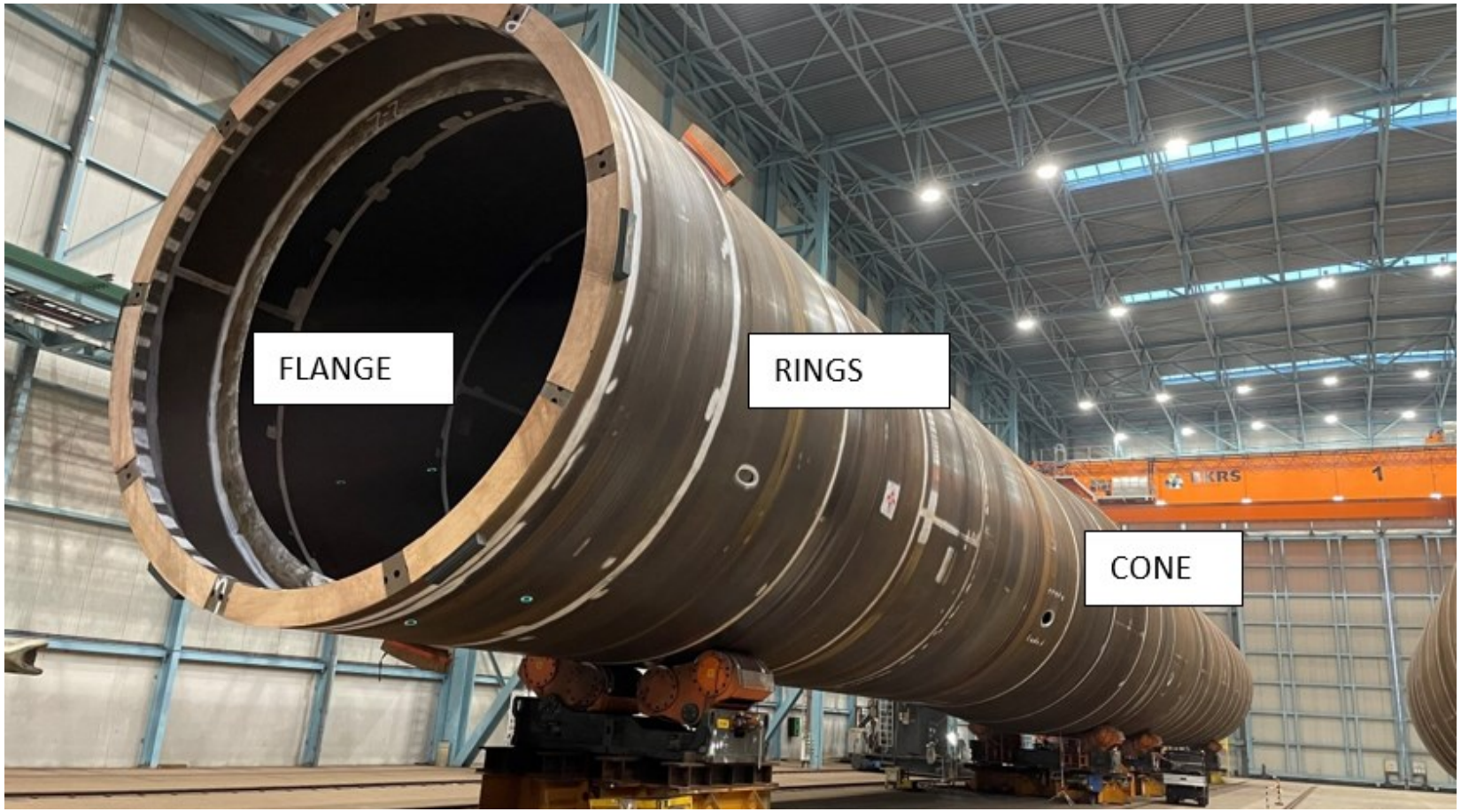


special lifting clamps

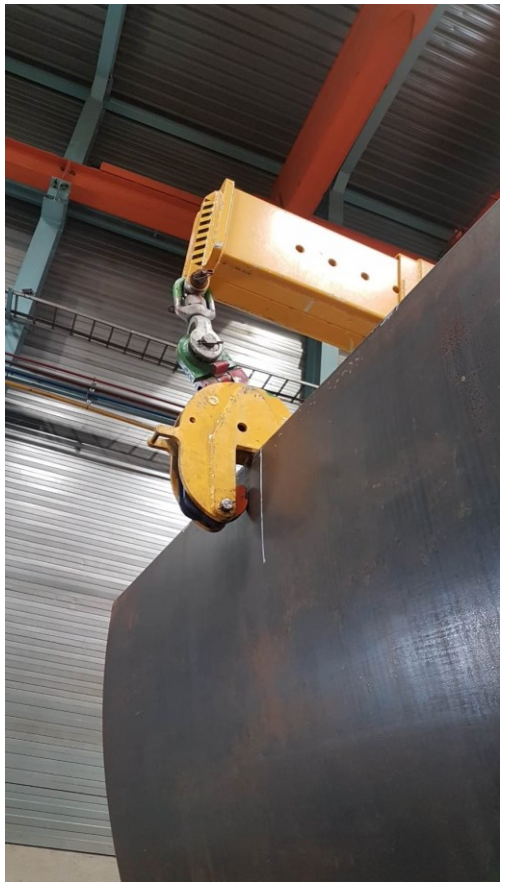
Standard vertical clamp

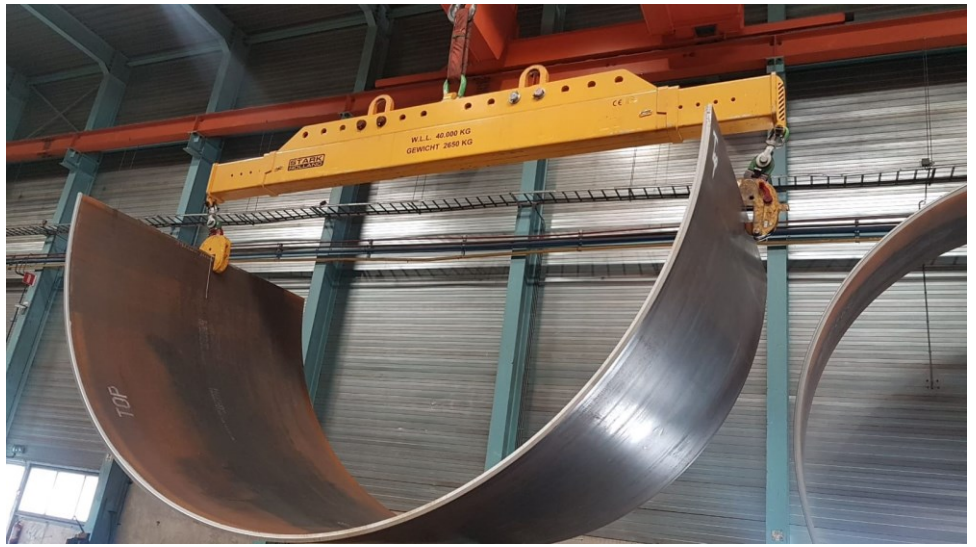
Special orizontal clamp

MONOPILES PRODUCTION PROCESS



MONOPILES PRODUCTION PROCESS



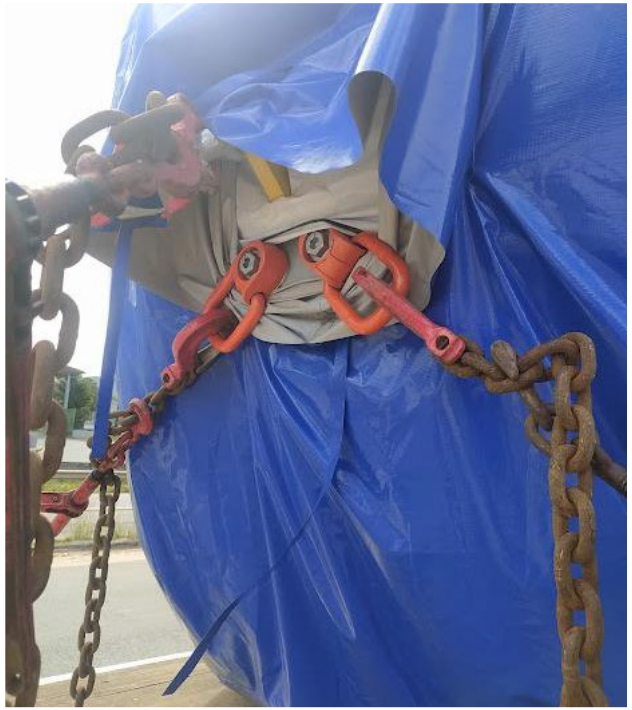


Capacity	R	S	T	U	V	W	X	Y	Weight
30000 kg	60 – 140 mm	400	100	1100	620	150	140	71	250 kg
30000 kg	40 – 120 mm	250	100	952	595	143	140	71	172 kg
35000 kg	60 – 140 mm	400	100	1100	665	200	180	71	310 kg

MONOPILES PRODUCTION PROCESS

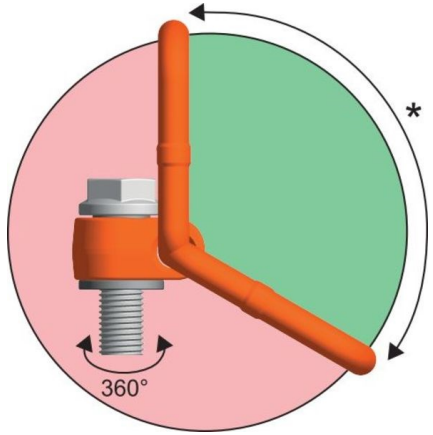
1. EFFICIENT
2. SMART DESIGN
3. ROBUST DESIGN
4. STABLE
5. SAFE
6. SCALABLE DESIGN
7. COMPETITIVE PRICING

LASHING APPLICATIONS

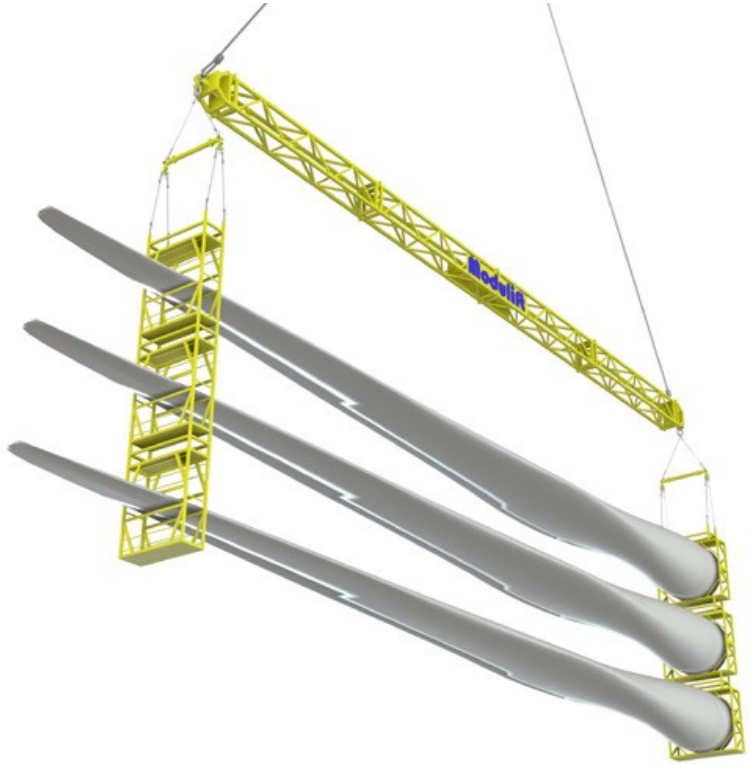


M42 lifting points

Lashing chain slings + lifting points



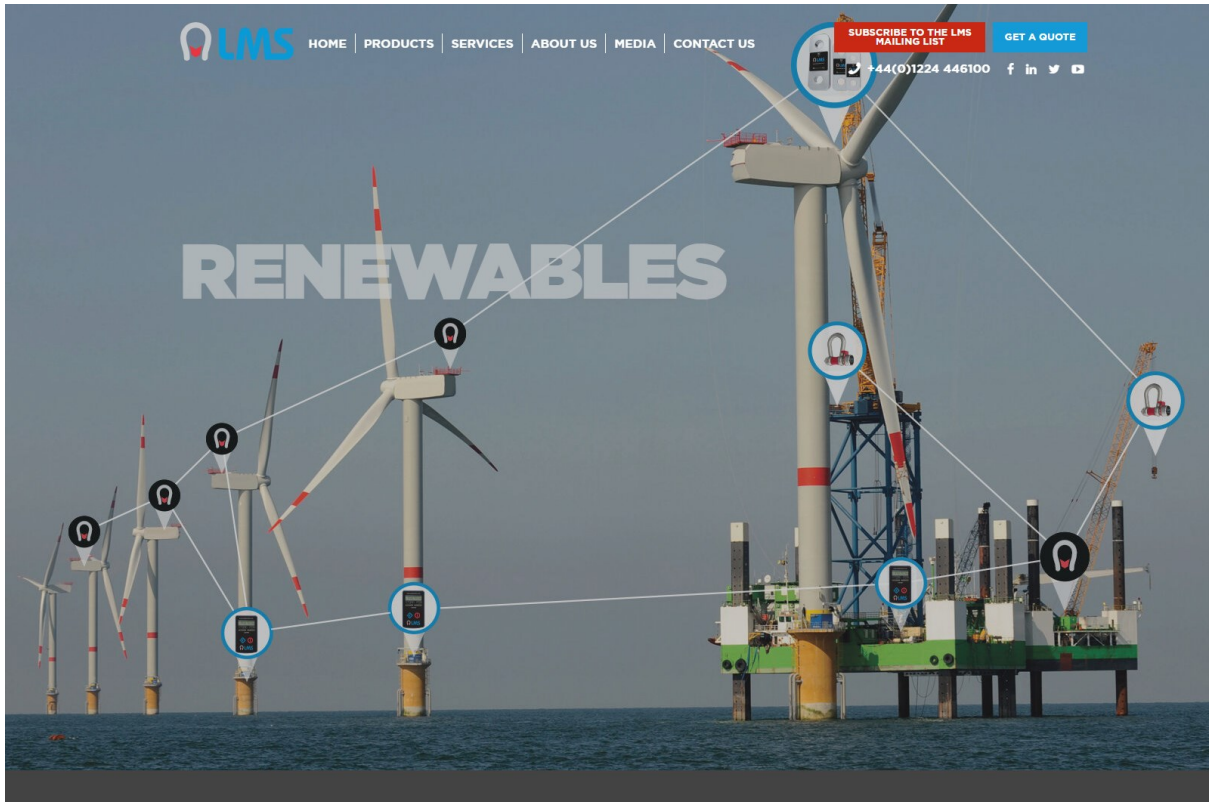
LOGISTIC AND INSTALLATION SOLUTIONS



Lifting frames to meet every requirement

Standard spreaders working with monopiles and transition pieces

LOAD MONITORING SOLUTIONS FOR WIND



A strategic complement to wind energy product portfolio

Monitoring load remotely

INSPECTION AND MAINTENANCE

PPE – Personal Protection Equipment

Anchorage Point

Stainless Steel

RELEVANT INDUSTRY REQUIREMENTS

LIFTING AND LASHING EQUIPMENT

Tower Production

- Lifting Points
- Grade 80/100/120 Chain slings
- Polyester slings
- Beams/Trolleys
- Special Clamps
- Anchor points for PPE
- Mooring chain
- Stainless Steel chain and fittings
- Shackles

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Tower Installation

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- Anchor points
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Tower Maintenance

- Synthetic tools bag
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- Hoists/Hoist Chain

Offshore

- Mooring chain
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Tower Regeneration

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- Grade 80/100/120 Chain slings
- Textile lashing straps
- Hoists
- Rotatable lifting points
- Spreader Beams
- Special Clamps
- PPE Equipment
- Load cells

THANK YOU

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Thank you for your time

Ross Moloney ross.moloney@leeaint.com