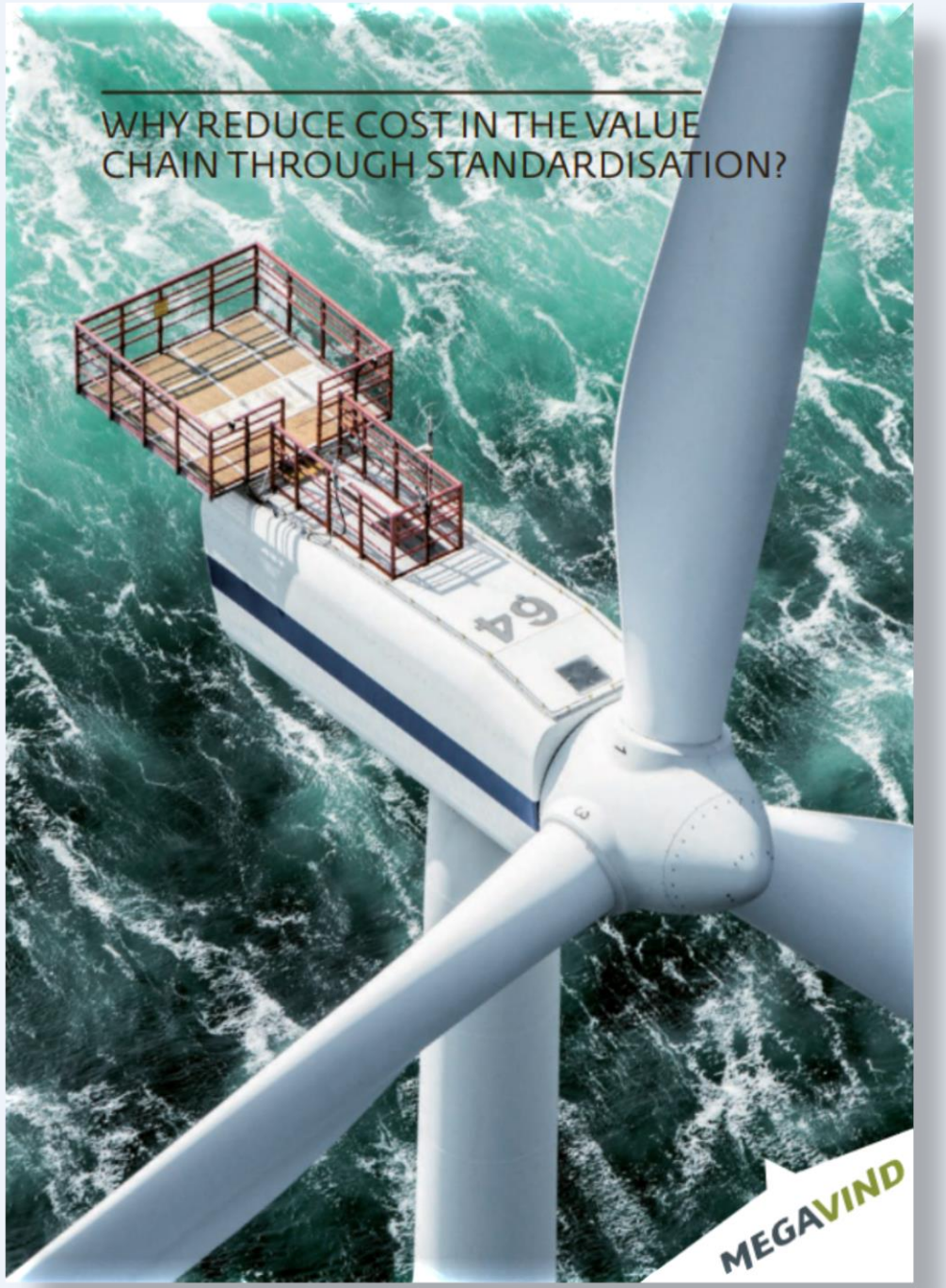
Standardization in the wind sector – update on progress

At Wind Energy Denmark 2018, 3 leading OEMs* presented topics for industry standardization that can be processed together. This session gives a status on commenced activities and examples of how the standardization activities are handled in the sector

* Vestas, Siemens Gamesa, MHI Vestas



"These years, there is a strong focus on closer collaboration between manufacturers and suppliers. In launching this standardization hot list, we at Wind Energy Denmark seek to do exactly that - inviting the industry to take part in prioritizing collaboration across the value chain to take the next steps in realizing cost reduction potential. I expect that in the coming 2-3 years we will see concrete innovation projects that are prompted by this hot list," says Torben Hvid Larsen @ WED 2018.

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Wind turbine incl. Balance of Plant

Hot list:

Common Foundation interface;
Common Boat Landing system;
Common Local Sourcing;
Casted Components;
Tower welding;
Common Steel sourcing and Flange sourcing;
33/66kV;
Tower diameter production capability;
Foundation design;
Array Cable;
Substation.

Not list:

Blades
Hub
Nacelle
Controls and controller software
Installation above tower top flange

Operation & maintenance

Hot list:

Installation / transport;

O&M standardization;

Health Safety Environment related; sourcing;

Decommissioning.

Not list:

Scheduled and unscheduled service;

Transport and installation.

Hot or not list
what happened since last year? (1/2)

- Transport
- Casted Items
- Bolts
- Yaw Gear
- Bolts
- Documentation
- Service Cranes

Per Hessellund Lauritsen, Research Manager, Siemens Gamesa Renewable Energy
Agnar Gudmundsson, Senior Specialist, Vestas Wind Systems
Lars Laursen Møller, Senior Product Specialist WGT, MHI Vestas Offshore Wind

Hot or not list
what happened since last year? (1/2)

- Tower Vortex
- Fire Extingusiher
- Surface Treatment in Nacelle
- Decom Blade
- Lifting Guidelines
- Recommended Practice – Design of Lifting, Transport, Storage and Accessory Equipment

Per Hessellund Lauritsen, Research Manager, Siemens Gamesa Renewable Energy
Agnar Gudmundsson, Senior Specialist, Vestas Wind Systems
Lars Laursen Møller, Senior Product Specialist WGT, MHI Vestas Offshore Wind

QUESTIONS TO THE OEM'S?

ENERGY INNOVATION CLUSTER

Standardisation in the wind sector - update on progress

Wind Denmark, 1 October 2019

Glenda Napier, CEO, Energy Innovation Cluster

Christian Munk, Project Manager, Energy Innovation Cluster

DANMARKS KLYNGEORGANISATION OG INNOVATIONSNETVÆRK FOR ENERGIPRODUKTION

ENERGY
INNOVATION
CLUSTER

Industrialization brings cost down

Purpose

- The project's objective is joint interpretation of various industry standards within offshore wind energy.. – with a view to make the (non-binding) **solutions and recommendations to such matters generally applicable within the offshore wind energy industry among all actors in the industry**
- .. to enhance and improve the possibilities for **development and innovation** with a view to make the offshore wind energy business more cost (and in general resource) efficient for the benefit of all actors in the industry…This will further **positively affect the cost of energy and electricity consumers**

(Cooperation and confidentiality Agreement signed by SGRE, Vestas, MVOW and EIC in 2017)

ENERGY INNOVATION CLUSTER

Status

- EIC adopted the industry's ”hot or not list”
- Decided on 5 specific areas to begin with
  - Guidelines for execution of lifts
  - Common design guidelines
  - Guidelines for vessel access
  - Surface treatment
  - Common equipment for tower transport
- Formed a group of 42 collaborators and suppliers – who all signed the CCA before starting the new collaboration.
- Finalized 5 out of 5 projects

ENERGY INNOVATION CLUSTER

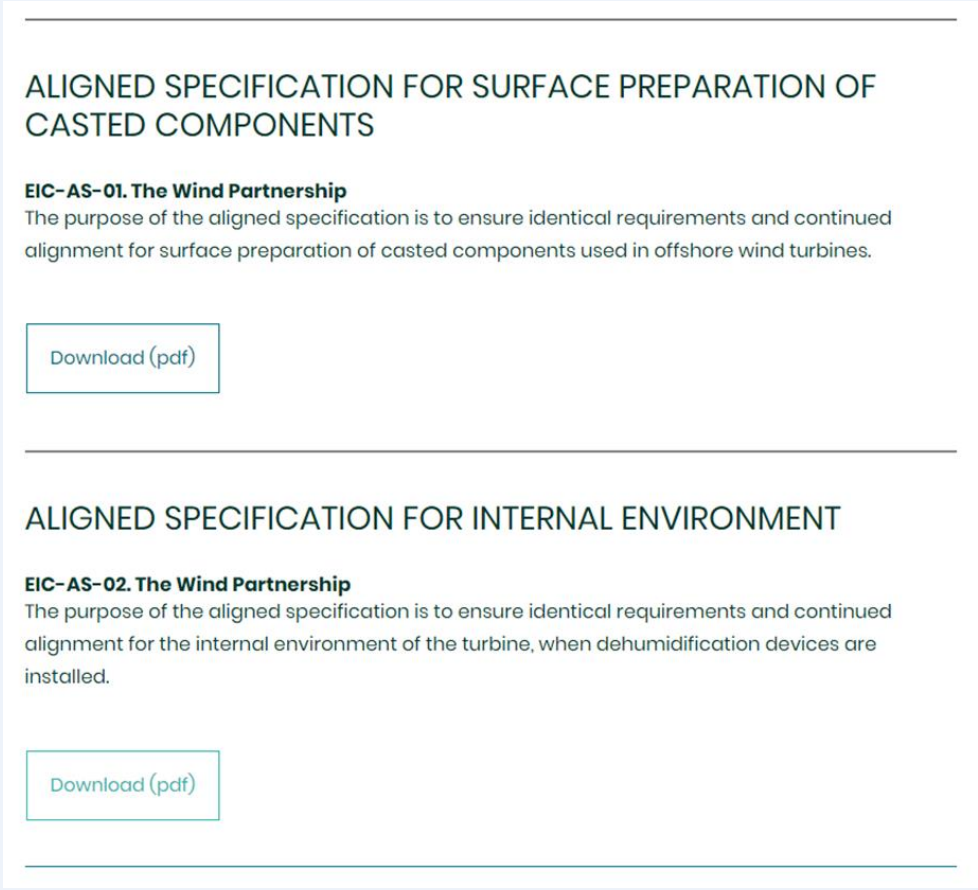
Participants signing CCA and contributed to projects

NO.	NAME	GUIDELINE FOR EXECUTION OF LIFTS	COMMON DESIGN GUIDELINE	COMMON EQUIPMENT	SURFACE TREATMENT	VESSEL ACCESS
1	Energy Innovation Cluster					
2	MHI Vestas Offshore Wind					
3	Siemens Gamesa Renewable Energy					
4	Vestas Wind Systems					
5	A2Sea					
6	Blue Water Shipping					
7	Ørsted					
8	Maritime Development Centre					
9	Statoil					
10	Vattenfall					
11	Fred. Olsen Windcarrier					
12	DIS					
13	Force Technology					
14	LICengineering					
15	R&D					
16	Semco Maritime					
17	Dancoat					
18	East Metal					
19	Eissengiesserei Torgelow					
20	Gardit					
21	Global Castings					
22	Muehlhan					
23	Sakana					
24	Skagen Overfladeteknik					
25	Goliak					
26	COTES					
27	Teknos					
28	Hempel					
29	DNV GL					
30	Dynamica Ropes					
31	PolyTech					
32	Hvide Sande Shipyard – Steel Service					
33	Mammoet					
34	**Liftra**					
35	**Eltronic**					
36	**SH Group**					
37	**Advantis**					
38	**BIIR**					
39	**BMS**					
40	**BBC Chartering**					
41	**Inrotech**					

ENERGY INNOVATION CLUSTER

Results (1/5)

- Aligned specifications for preparation of casted components
- Aligned specifications for internal environment
- Download on www.eicluster.dk



ALIGNED SPECIFICATION FOR SURFACE PREPARATION OF CASTED COMPONENTS

EIC-AS-01. The Wind Partnership
The purpose of the aligned specification is to ensure identical requirements and continued alignment for surface preparation of casted components used in offshore wind turbines.

Download (pdf)

ALIGNED SPECIFICATION FOR INTERNAL ENVIRONMENT

EIC-AS-02. The Wind Partnership
The purpose of the aligned specification is to ensure identical requirements and continued alignment for the internal environment of the turbine, when dehumidification devices are installed.

Download (pdf)

ENERGY INNOVATION CLUSTER

Results (2/5)

To give input download the input document and send it to standard@eicluster.dk. We appreciate your contribution and will get back to you after the next revision at the latest.

To sign up for news, simply email standard@eicluster.dk.

VESSEL ACCESS ALIGNED INTERFACES

OE-RP-02. THE WIND PARTNERSHIP
The purpose of this document is to ensure that requirements to vessel access are aligned to enable industry requirements.

Formed by Siemens Gamesa Renewables Energy and MHI Vestas Offshore Wind

Download (pdf)

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Results (3/5)

- DNV-GL approved RP for design of lifting, transporting, storage and accessory equipment
- Download on www.eicluster.dk

ENERGY INNOVATION CLUSTER

Results (4/5)

- DNV-GL approved RP and guidelines for Planning and execution of WTG Lifting Operations
- Download on www.eicluster.dk

ENERGY INNOVATION CLUSTER

Results (5/5)

- New common equipment for transport of towers
- Done Q4 2019

Much more to be industralized …

- EIC will continue the work together with the industry on industrialization
- In progress of identifying new projects
- In progress of identifying funding opportunities
- To be continued later in 2019….

ENERGY INNOVATION CLUSTER

Common lifting guidelines

- Purpose
- Content
- Impact
- Process
- Next

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

MEGAVIND

Common lifting guidelines

Christian Munk Jensen
Project Manager

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Christian Munk Jensen, Project Manager, Energy Innovation Cluster

MEGAVIND

I have a suggestion…

Your suggestions for improvement are welcome at www.eicluster.dk/rp

Revision workshop last week, input from Ørsted, Jan De Nul, Vento Marine etc.

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

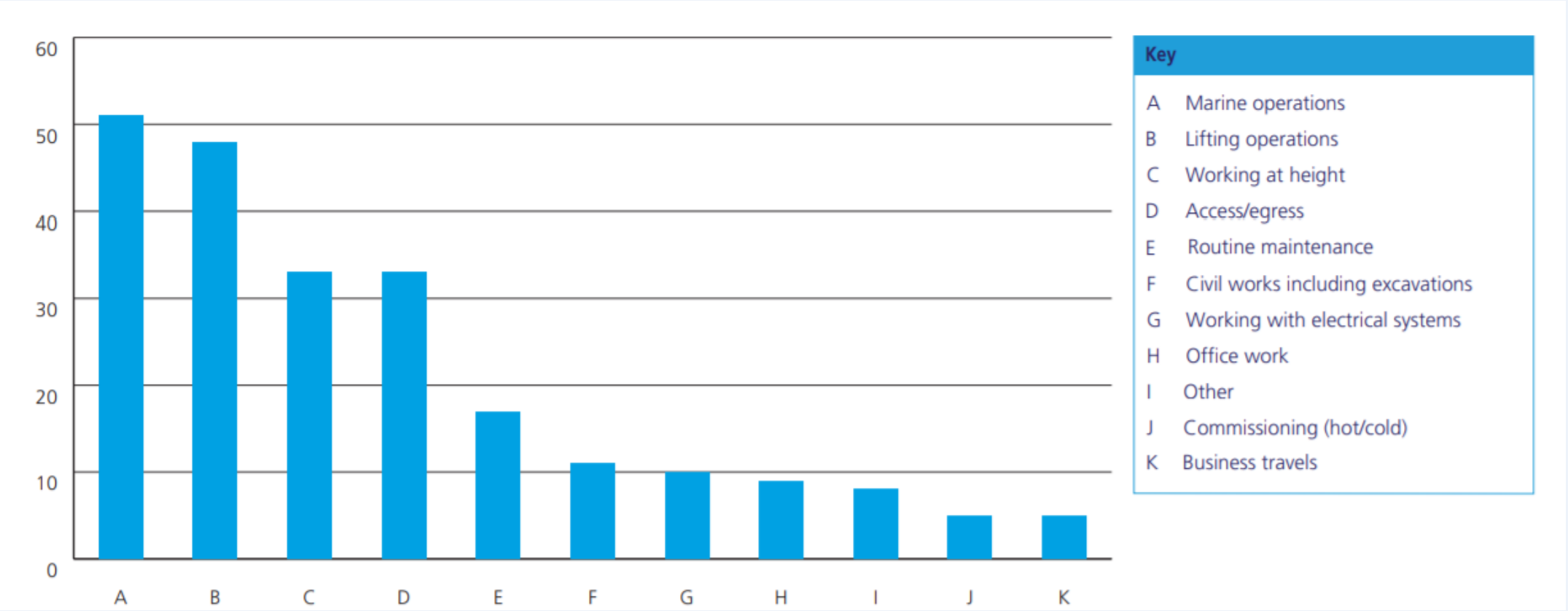
Purpose

- Significant experience with our particular types of lifts
- Large variations in experience the industry
  - No plan ←→ Seperate department
- Many involved parties
- Maturity increases requirements
- Large cost impact
- Safer working enviroinment and understanding
- Not rocket science - common sense written down
- Growth and price pressure

≠

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

High Potential Incidents



G+ Global Offshore Wind Health and Safety Organisation 2018 incident data report

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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Content

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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3 Scope

All offshore wind lifting operations from the factory and onwards in the supply chain.

7 Planning Of Lifting Operations

Planning of any lifting operations should at least address the following subjects:

- Objectives of the lifting operation
- Characteristic of the load
- Lifting equipment
- Classification of lifting operation
- Identification of hazards and risk assessment
- Resources
- Preparation of Lift Plan
- Application of Permit-to-Work System

7.5.1 Class One – Basic Routine, Repetetive Lifts

Examples of Classification one lifting operations are:

- Lifting of standardized goods; intended and suitable for safe lift (e.g. pallets, containers)
- Lifting of loads with CoG and Gross weight known or easily estimated
- Operations where standard rigging and slinging practices can be applied
- WTG Foundation Davit crane lifts
- Nacelle crane lifts

The Competent Person must:

- Ensure appropriate information for lift planning is available.
- Assess supervision requirements and include supervision role.
- Ensure a clear definition of roles and responsibilities.
- Clarify if dynamic factors will influence the lifting operations.
- Identify hazards and conduct a risk assessment.
- Prepare the Lift Plan.
- Ensure properly managed inspection and maintenance regime for lifting appliances and lifting accessories.
- Issue a Pre-Task Plan in case of variations or changes.
- Review and correct regularly the Lift Plan.
- Ensure complacent attitude towards repetitive lifting operations is not allowed to develop.

7.5.2 Class Two - Intermediate, Complicated, Complex Lifts

Examples of class two lifting operations:

- Lifting of loads with unknown Gross weight and CoG. Engineering input required.
- Lifting of complex shape or a load with COG offset or variable lifting point loads.
- Tandem crane lifting.
- Lifting of WTG main components, e.g. hub, generator, nacelle, tower, blade.
- Operations where standard rigging and slinging practices do not apply. Engineering input required.
- Conducted in difficult or restricted areas.

The Competent Person should:

- Ensure appropriate information for lift planning is available.
- Nominate the Lifting Supervisor for the task
- Clarify if and what dynamic factors will influence the lift.
- Identify hazards and conduct risk assessment.
- Prepare the Lift Plan.
- Ensure properly managed inspection and maintenance regime for lifting appliances and lifting accessories.
- Seek out engineering support and specialist knowledge, where necessary.
- Produce detailed planning lifting drawings.
- Ensure rigging instructions are in place.
- Produce appropriate documentation for briefings.
- Carry out audit and review of lifting operations.
- Review and correct the Lift Plan.
- Support the Lifting team when requested

Identification of hazards and risk assessment

Load	Environment	Proximity to
• Position of CoG, incl. unknown position • Location and type of lifting points • Complex slinging arrangements • Use of load control systems • Uncertainty in weight of load • Two crane lifting operations • Integrity of load • Load dynamics, floating, in port or in field • High surface area and drag coefficient • Weight transfer • Arial load transfer • Orientation of the load • Access to lifting points • Sharp edges • Protruding load parts	• Snow • Ice • Hail • Rain • Wind • Lightning • Sea state • Fog • Uneven ground • Poor ground conditions • Poor sea bed conditions	• WTG components • Adjacent vessels • Vessel structures (jack-up legs, masts, accommodation) • Roads • Rail • Passing vessels • Adjacent cranes, MEWPS or other plant and equipment • Temporary works (e.g. scaffolding) • Proximity to quayside • Mooring lines • Permanent and temporary lighting • Power lines • Personnel

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Lift Plan

The Lift Plan shall include details, as a minimum, of the following:

- Description of the operations.
- Organisation and responsibilities
- Communication
- Characteristics of the load.
- Configuration and load charts of the lifting appliances / cranes
- Lifting accessories details
- Rigging instructions
- Limiting environmental criteria for each lift
- Planning drawings (if required)
- Check lists
- Contingency plans

10 Execution of Lifting Operations

10.1 Good Practice Prior To Lifting

10.2 Pre-task Brief

10.3 Communications

10.4 Good Practice During Lifting

10.5 Environmental (Weather) Conditions

- Ensuring the lifting team is briefed on the operation and aware of the Lift Plan content.
- Applicable planning drawings for the operation.
- Pick up and lay down positions, travel path and elevation of the load from ground, vessel or structure.
- Rigging arrangement. Rigging drawings (if available) for the load.
- Lifting accessories to be used in the operation.
- Pre- and post-use of lifting accessories and appliances.
- Permit to Work, Certificate of Approval and any conditions imposed by them.
- Lifting zones, areas to be closed off to personnel not associated with the operation.
- Hazards associated with the lifting operation.
- Method of communications during the operation.
- Radio channels to be used, agreed hand signals.
- Weather limits and weather window for the operation, lightning risk.
- Allocation of personnel to a particular task, i.e. Crane Supervisor, Crane operator, Signaller, Riggers.
- PPE requirements.
- Information from previous shifts handover.
- Time out, has anything changed since the lift plan was developed.
- Any other business, i.e. "Does everyone understand the task?"

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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11 Safe Use of Lifting Appliances

11.1 Installation Vessel Cranes

11.2 Support Vessel Cranes

11.3 Lifting Equipment Used For Lifting Persons

11.4 Winches

11.5 Mobile Cranes

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

Competent Person

RESPONSIBILITY

- Develop a Lift Plan in accordance with Industrial standard and local legislation.
- Establish the correct crane to be used, based upon weight of load, weight of lifting accessories, height of load and radius of lift
- Consider the location of the lifting operation, including ground conditions
- Ensure that the crane is thorough examined (including lifting accessories)
- Ensuring that a system for reporting defects is in place.
- Select appropriate lifting accessories, including their method of attachment to the load, and any protection used to prevent damage
- Conduct a risk assessment for the operation and communicate mitigations to all persons involved in the operation.
- Brief all persons involved in the lifting operation to ensure that the safe system of work described in the Lift Plan is understood.
- Handover of the Lift Plan to the Lift Supervisor
- Ensure that there is a Lift Supervisor designated to direct personnel and to ensure that the operation is carried out in accordance with the Lift Plan.
- Liaise with any other persons or authority, as required to overcome any hazard, by including any necessary corrective action or special measures in the safe system of work.
- Ensure that lifting points provided on the load are adequate for the loads applied.
- For Tandem Lifting, ensure that the cranes are compatible in lifting characteristics, with sufficient margins within the rated capacity of each crane to allow for any additional dynamic loading that could be transferred from one crane to another during movement of the load.
- Ensure that the lifting operation is planned so that there is no possibility of contact between the jibs of the cranes or jibs and/or the load.

COMPETENCE REQUIREMENTS

- Awareness of the requirements of the Industrial standard.
- Competent person qualified and/or certified with practical/theoretical knowledge to the Industrial standard and local requirements.
- Knowledge of the requirements under local legislation, regulations and codes of practice that relate to all types of lifting duties.
- Knowledge of maintenance, inspection, thorough examination and testing requirements of lifting equipment and accessories.
- Understanding of relevant information relating to different types of lifting accessories i.e. markings, certificates, and thorough examination reports, etc.
- 5 years minimum comprehensive experience in Lifting Operations and 2 years of planning lifting operations.

Lift Supervisor

RESPONSIBILITY

- The Lift Supervisor should direct and supervise the lifting operation, ensuring that these are carried out in accordance with the Lift Plan
- Supervisor the interface during all sequential and/or simultaneous lifting operations within the lifting zone to ensure safe execution.
- Ensure all persons involved with the lifting operations are qualified to perform their task i.e. certificated evidence.
- Brief all persons involved in the lifting operation to ensure that the safe system of work described in the Lift Plan is understood
- Perform toolbox talk prior to lifting operation.
- Ensure pre-lift checklist is completed and signed before the lift is initiated
- Give clear, unambiguous instructions to all other members of the lifting team
- Conduct shift handovers
- The Lift Supervisor has sufficient authority and MUST stop the lifting operation if the supervisor considers it dangerous to proceed.
- Liaise with the Competent Person for all matters relating to the Lift Plan – i.e. to request a variation and obtain authorization.
- Sign onto the Lift Plan.

COMPETENCE REQUIREMENTS

- Awareness of the Industrial standard.
- Qualified and certified with practical/theoretical knowledge to the industrial standard and local legislation
- Fully conversant with the duties of all persons involved in the lifting operation;
- Understanding of relevant information relating to different types of lifting accessories i.e. markings, certificates, and thorough examination reports, etc.
- Able to assess danger to the lifting operation from changed circumstances on site.
- Full knowledge and understanding of the SSOW (Lift Plan and/or work instructions).
- To be assessed and approved by the Competent Person.

- Classification 1 requires 1 year comprehensive experience and a minimum of lift Supervisor training.
- Classification 2 requires 4 years minimum comprehensive experience in Lifting Operations.

Classification 1 Competent Person

RESPONSIBILITY

- The Competent Person to be in charge of the execution of lifts in class 1
- The Lift Responsible should direct and supervise the lifting operation, ensuring that these are carried out in accordance with the Lift Plan
- Brief all persons involved in the lifting operation to ensure that the safe system of work de-scribed in the Lift Plan is understood
- Perform toolbox talk prior to lifting operation.
- Ensure visual pre-lift check is completed before the lift is initiated
- Give clear, unambiguous instructions to all other members of the lifting team
- Ensure that the works are completed in timely, safe and controlled manner
- Responsible to the competent person
- To be assessed and approved by the project. Must report to the competent person with any issues related to lifting operation or variations in lifts

COMPETENCE REQUIREMENTS

- Is an appointed technician.
- Executing classification 1 lifts requires 1 year relevant experience in lifting operations or supervision by a Competent Technician.
- Qualified and certified with practical/theoretical knowledge to Offshore Lifting Operations.
- Fully conversant with the duties of all persons involved in the lifting operation
- Understanding of relevant information relating to different types of lifting accessories i.e. markings, certificates, WLL etc.
- Able to assess risks to the lifting operation from changed circumstances on site.
- Full knowledge and understanding of the SSOW (Lift Plan and/or work instructions).

Lift Appliance/crane Operator

RESPONSIBILITY

- Participate in the planning of lifting operations where applicable
- Comply with the manufacturer's instructions for the safe set up, operation and maintenance of the Lifting Appliance/Crane
- Follow instructions and signals given by the nominated Signaller at all times
- Immediately stop the operation when instructed to do so – i.e. When an emergency stop signal is given.
- The Lifting Appliance/Crane shall be attended whilst under load.
- Complete all required "routine" periodic checks and pre & post-use inspections
- Participate in the pre-lift talk of lifting operations.
- Sign onto the "Tool box Talk"

COMPETENCE REQUIREMENTS

- Qualified and certified in the specific type of lifting appliance and/or in accordance with the requirements of local legislation.
- Able to assimilate and apply information contained in reports and duty charts relating to the range of duties and safe use of the Lifting Appliance
- Qualified Slinger/Rigger.
- Full knowledge and understanding of the SSOW (Lift Plan and/or work instructions).
- Relevant training certificates
- Classification 1 requires 1 year relevant experience in lifting operations or supervision by a Competent Technician.
- Classification 2 requires 1 year comprehensive experience in lifting operations.

Slinger/Rigger

RESPONSIBILITY

- Participate in the pre-lift talk of lifting operations.
- Responsible for attaching and detaching the load to and from the Lifting Appliance/Crane attachment.
- Ensure the correct use lifting accessories and other equipment in accordance with relevant manuals, work instructions, SSOW (Lift Plan) and Risk Assessment
- Perform pre & post use checks on lifting accessories
- Ensure equipment found damaged or faulty is reported to the Lift Supervisor, removed from service, tagged and quarantined accordingly
- Sign onto the Pre-lift checklist (where applicable)
- Sign onto the SSOW (Lift Plan) "Tool Box Talk"

COMPETENCE REQUIREMENTS

- Qualified with practical/theoretical knowledge about SSOW (Lift Plan) and/or work instruction.
- Slingers operating specialized equipment, must be trained in accordance with the manufacturers requirements and/or scope of work requirements.
- Able to establish weights and the effect of the centre of gravity, and to balance loads and judge distances and clearances.
- Able to select the appropriate lifting accessories and check that they are in a suitable condition
- Relevant training certificates.
- Classification 1 requires 1 year relevant experience in lifting operations or supervision by a Competent Technician.
- Classification 2 requires 1 year comprehensive experience in lifting operations.

Signaller/Signal Person

RESPONSIBILITY

- Participate in the pre-lift talk of lifting operations.
- Provide distinct, clear and agreed signals (verbal instructions when using audio equipment) to the Lifting Appliance operator in order to direct the lifting movement.
- Request additional personnel to assist, if required when directing blind lifts.
- Direct safe movement of the Lifting Appliance Operator and load
- Sign onto the "Tool Box Talk".

COMPETENCE REQUIREMENTS

- Qualified with practical/theoretical knowledge to the industrial standard and local requirements.
- Agreed Verbal commands (terminology)
- Agreed Hand Signals (recognized signals).
- Knowledge of the SSOW (Lift Plan) and/or work instructions.
- Relevant training certificates.
- Classification 1 lifts requires 1 year relevant experience in lifting operations or supervision by a Competent Technician.
- Classification 2 lifts requires 1 year comprehensive experience in lifting operations.
- As Competent person in Classification 1:
  - Fully conversant with the duties of all persons involved in the lifting operation;
  - Understanding of relevant information relating to different types of lifting accessories i.e. markings, certificates, and thorough examination reports, etc.
  - Able to assess danger to the lifting operation from changed circumstances on site.
  - 1-year minimum comprehensive experience in signalling lifting operations.

Impact

- Reduced risk
- Wind speed measured at component height level
- Reduced alpha factor requirements
- Increased effectiveness of planning and acceptance of standard documentation
- Cheaper to change between projects
- Reduced risk in case of disease
- Faster reduction of wind speed requirements to a ”normal” level
- Reduced risk of delays
- Increased knowledge across the entire industry reducing cost and increasing safety
- Steeper learning curve for new markets
- Reduced waste in learning different guidelines and in time training

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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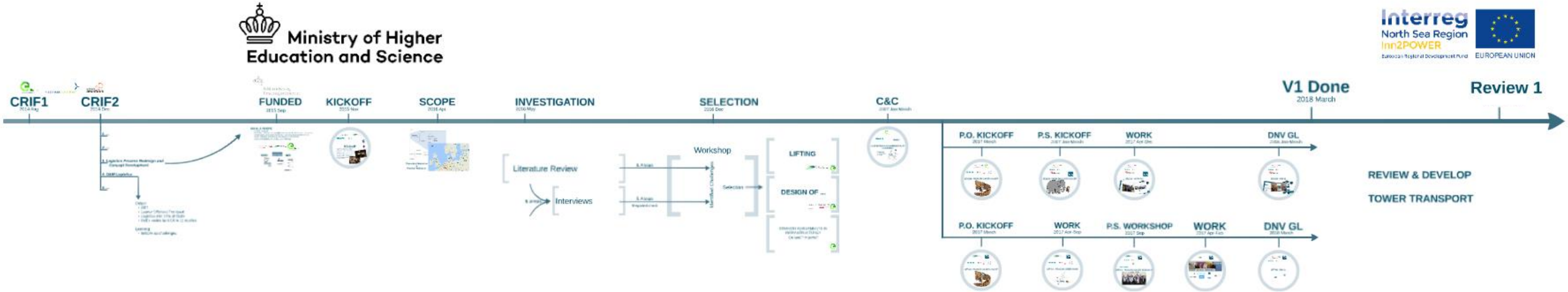
Process



Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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Process

C&C
2017 Jan-March

V1 Done
2018 March

P.O. KICKOFF
2017 March

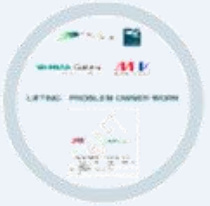
P.S. KICKOFF
2017 Jan-March

WORK
2017 Apr-Dec

DNV GL
2018 Jan-March

P.O. KICKOFF
2017 March

WORK
2017 Apr-Sep



P.S. WORKSHOP
2017 Sep

WORK
2017 Apr-Feb

DNV GL
2018 March

MEGAVIND

Process

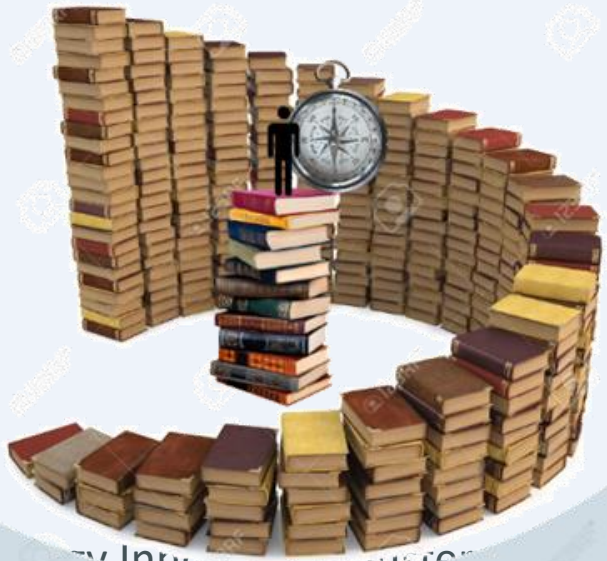
Transportens Innovationsnetværk

OFFSHORE ENERGY.DK

SIEMENS Gamesa RENEWABLE ENERGY

MHI VESTAS OFFSHORE WIND

LIFTING - PROBLEM OWNER KICKOFF



Christian Munk Jensen, Project Ma

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Process

Transportens Innovationsnetværk

OFFSHORE ENERGY.DK

SIEMENS Gamesa RENEWABLE ENERGY

MHI VESTAS OFFSHORE WIND

LIFTING - PROBLEM OWNER WORK

Christian Munk Jensen, Project Ma… …gy Innovation Cluster

MEGAVIND

Process

Transportens Innovationsnetværk

OFFSHORE ENERGY.DK

SIEMENS Gamesa RENEWABLE ENERGY

Statoil

Ørsted

VATTENFALL

MHI VESTAS OFFSHORE WIND

FORCE TECHNOLOGY

Fred. Olsen Windcarrier

BLUE WATER SHIPPING

A2SEA

MAMMOET Wind

LIFTING - PROBLEM SOLVER WORKSHOP

Christian Munk Jensen, Project Ma… …y Innovation Cluste…

MEGAVIND

Process

Transportens netværk

OFFSHORE ENERGY.DK

MHI VESTAS OFFSHORE WIND

Fred. Olsen Windcarrier

OFFSHORE ENERGY.DK

Transportens netværk

Ministry of Higher Education and Science

SIEMENS Gamesa RENEWABLE ENERGY

Ørsted

MDC

Christian Munk Jensen, Project Ma[illegible] Innovation Cluste[illegible]

MEGAVIND

Process

SERVICE PLATFORM

OFFSHORE ENERGY.DK

SIEMENS Gamesa RENEWABLE ENERGY

MHI VESTAS OFFSHORE WIND

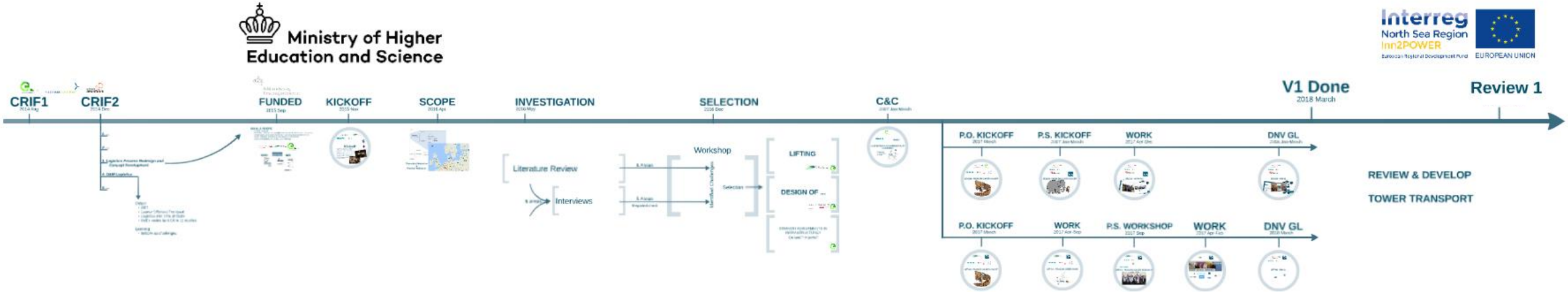
DNV·GL

LIFTING - DNV GL

Christian Munk Jensen, Project Ma[illegible] Innovation Cluste[illegible]

MEGAVIND

Process



Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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Revision

- Revision workshop 28/9
- Participation from:
  - Siemens Gamesa
  - MHI Vestas
  - GE
  - Ørsted
  - Vattenfall
  - G+
  - Energy Innovation Cluster

- Upcoming changes
  - Scope clarification
  - Suspended loads
  - Davit Cranes

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

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Process Considerations

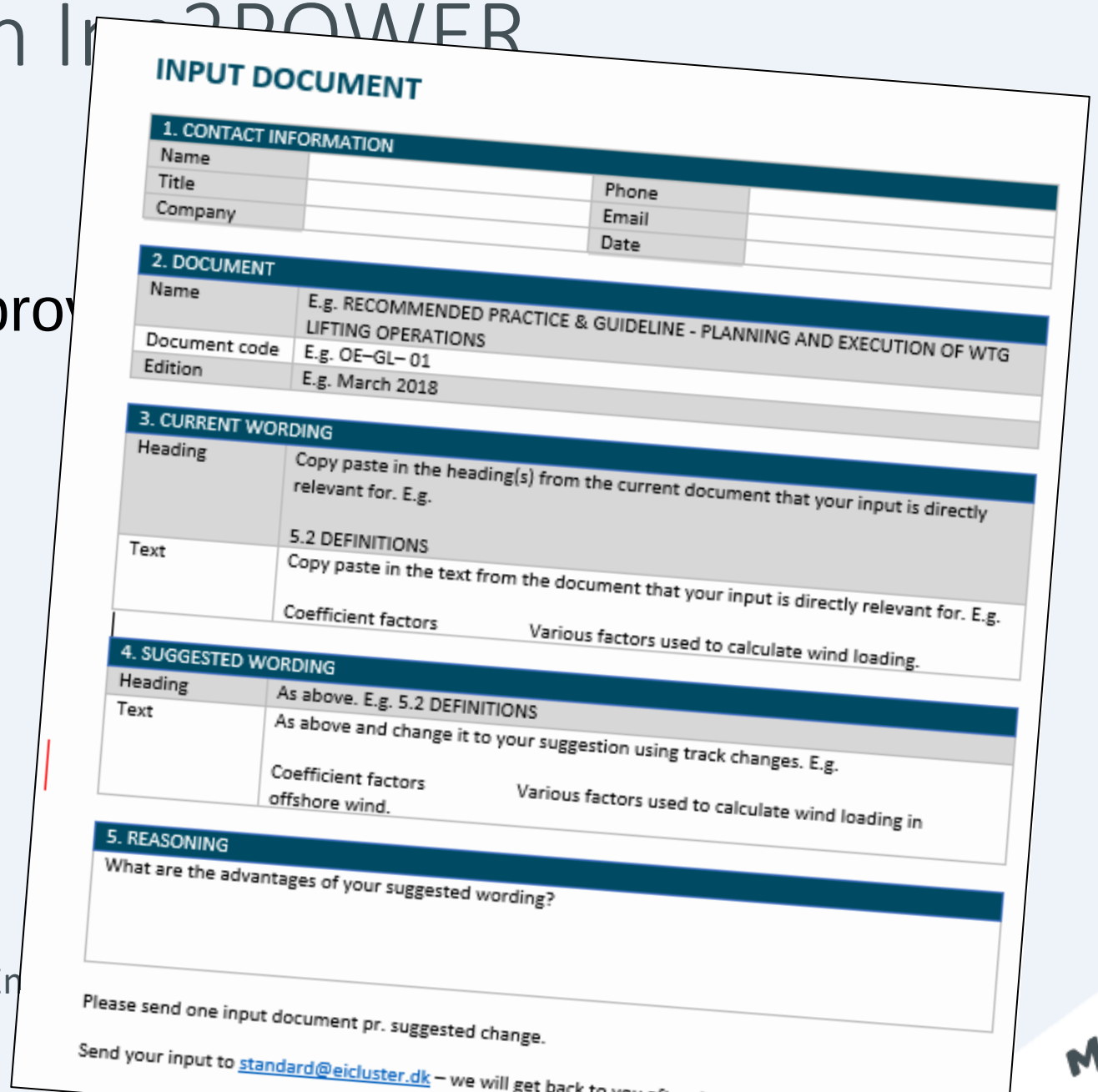
- Impressive to see experts coming together
- Allmost identical, but still complementing competencies
- Unbelievable

Christian Munk Jensen, Project Manager, Energy Innovation Cluster

Now Developed in In2POWER

Your suggestions for improv

www.eicluster.dk/rp



INPUT DOCUMENT

1. CONTACT INFORMATION			
Name		Phone	
Title		Email	
Company		Date	

2. DOCUMENT	
Name	E.g. RECOMMENDED PRACTICE & GUIDELINE - PLANNING AND EXECUTION OF WTG LIFTING OPERATIONS
Document code	E.g. OE–GL– 01
Edition	E.g. March 2018

3. CURRENT WORDING	
Heading	Copy paste in the heading(s) from the current document that your input is directly relevant for. E.g. 5.2 DEFINITIONS
Text	Copy paste in the text from the document that your input is directly relevant for. E.g. Coefficient factors Various factors used to calculate wind loading.

4. SUGGESTED WORDING	
Heading	As above. E.g. 5.2 DEFINITIONS
Text	As above and change it to your suggestion using track changes. E.g. Coefficient factors Various factors used to calculate wind loading in offshore wind.

5. REASONING
What are the advantages of your suggested wording?

Please send one input document pr. suggested change.

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Christian Munk Jensen, Project Manager, En

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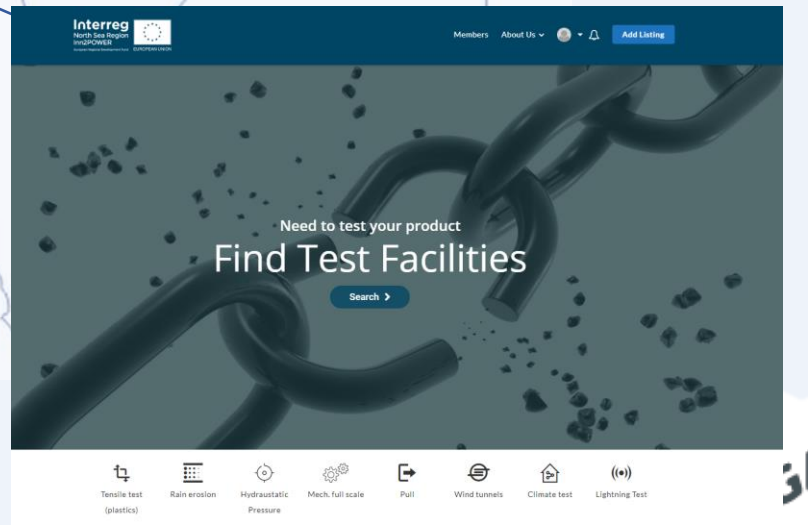

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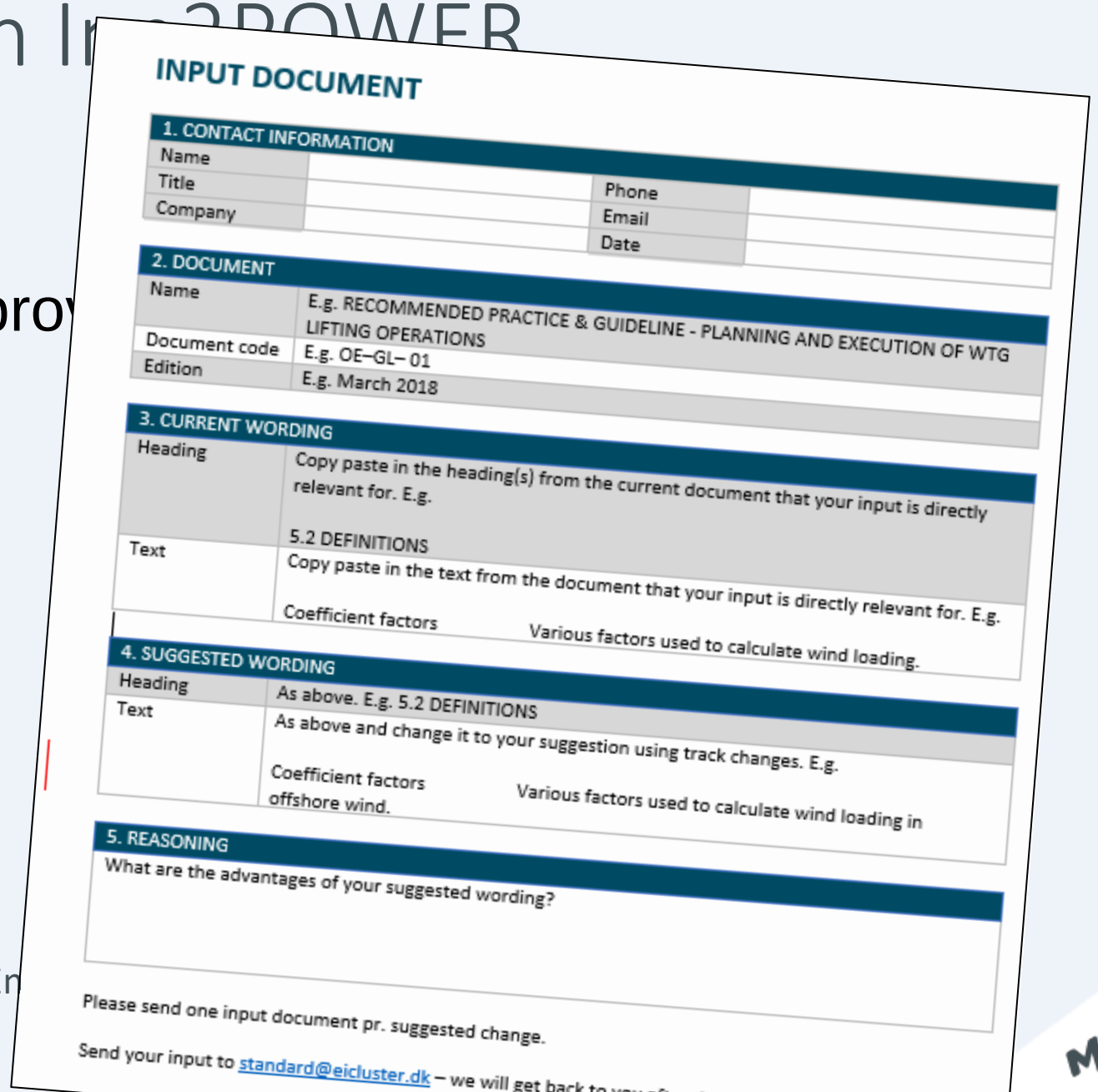

INPUT DOCUMENT

1. CONTACT INFORMATION			
Name		Phone	
Title		Email	
Company		Date	

2. DOCUMENT	
Name	E.g. RECOMMENDED PRACTICE & GUIDELINE - PLANNING AND EXECUTION OF WTG LIFTING OPERATIONS
Document code	E.g. OE–GL– 01
Edition	E.g. March 2018

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