

Standards and Guidelines for Marine Renewables (Wave & Tidal) Review and Development Workshop.

Installation and Offshore Construction

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Question?

Are our construction and installation processes and activities covered adequately under existing industry standards and guidelines?



OFFSHORE STANDARD
DNV-OS-H201

GL Noble Denton



TECHNICAL POLICY BOARD

Load Transfer Operations

APRIL 2012

GUIDELINES FOR MARINE LIFTING & LOWERING OPERATIONS

0027/ND

The electronic pdf version of this document found through <http://www.dnv.com> is the officially binding version



What is unique about Marine Renewables?

- Energetic environment with very unique construction risks.
- Many new / radical concepts.
- Various Industries with limited experience of working together.
- Rapidly moving to Array configuration in relatively short timeline.
- Investor confidence, commercial sensitivity & media interest.

- Limited Industry Guidance on Best Practise.
- No central source of Risks and methods to mitigate against.
- No common Risk Assessment criteria or Guidelines.
- Awareness of Codes / Practise from other Industries?
- Potential for clash of Codes requirements?

- The Roadmap Summary Report by UKERC into Marine Renewable Energy Technology in 2008 identified the need for such Guidelines / Best Practise to be developed.



Typical Risks

Typical risks shared with other industries, could be;

- Vessel collision – Other vessels, platform
- Spills – Oil, hydraulic fluid, freshwater, dye, MEG, treated water
- Ergonomics – Lighting, shelter, walkways, stretcher access.
- Lifting – Swinging loads, dropped objects.
- DP system classification.

Unique risks to the Wave and Tidal environment;

- Vessel collision – Mooring legs, turbine, foreshore, pile stickup.
- Ergonomics – Unusual ship/barge motions, difficult boat access.
- Lifting – Load caught in current, heading control during deployment subsea.
- Mooring legs – damage to sensitive seabed, VIV noise.
- Redundancy & Reliability of DP or mooring system.
- Damage from rocky seabed.



Key sources for Standards and Guidelines

- ISO (International Standards Organisation)
- HSE (Health and Safety Executive)
- MCA (Marine and Coastguard Agency)
- IMCA (International Marine Contractors Association)
Diving, Marine standards
- DNV (now DNVGL)
Certification, General Marine Operations
- GL Noble Denton (now DNVGL)
Load-out, towage, ballasting.
- Opito (Offshore Petroleum Industry Training Organisation)
Training and certification
- Oil & Gas UK
Decommissioning, security, aviation, manning
- OGP (International Association of Oil & Gas Producers)
Lifting guidelines



Are the existing guidelines/standards enough?



- There is a wealth of standards, many now free, to provide guidance.
- For Marine Renewables there are many unique effects and considerations not always addressed in existing codes.
- Existing standards are slow to change and have to consult wide range of stakeholders.
- Existing standards are often developed through experience feedback.
- How do we capture our own methods and experiences, plus make reference to the existing knowledge at the same time?



Objective of Proposed Document

Structure of document is to act as a Bridging document to existing Standards and Guidelines, pointing to exact sections in existing standards which are relevant to the phase/activity.

In addition;

- Where there is ambiguity or latitude to use other methods highlight this.
- Where there is no guidance, recommend actions to be taken or that 'appropriate' action should be taken.
- Highlight the difference between "Offshore Standard" and "Recommended Practise".

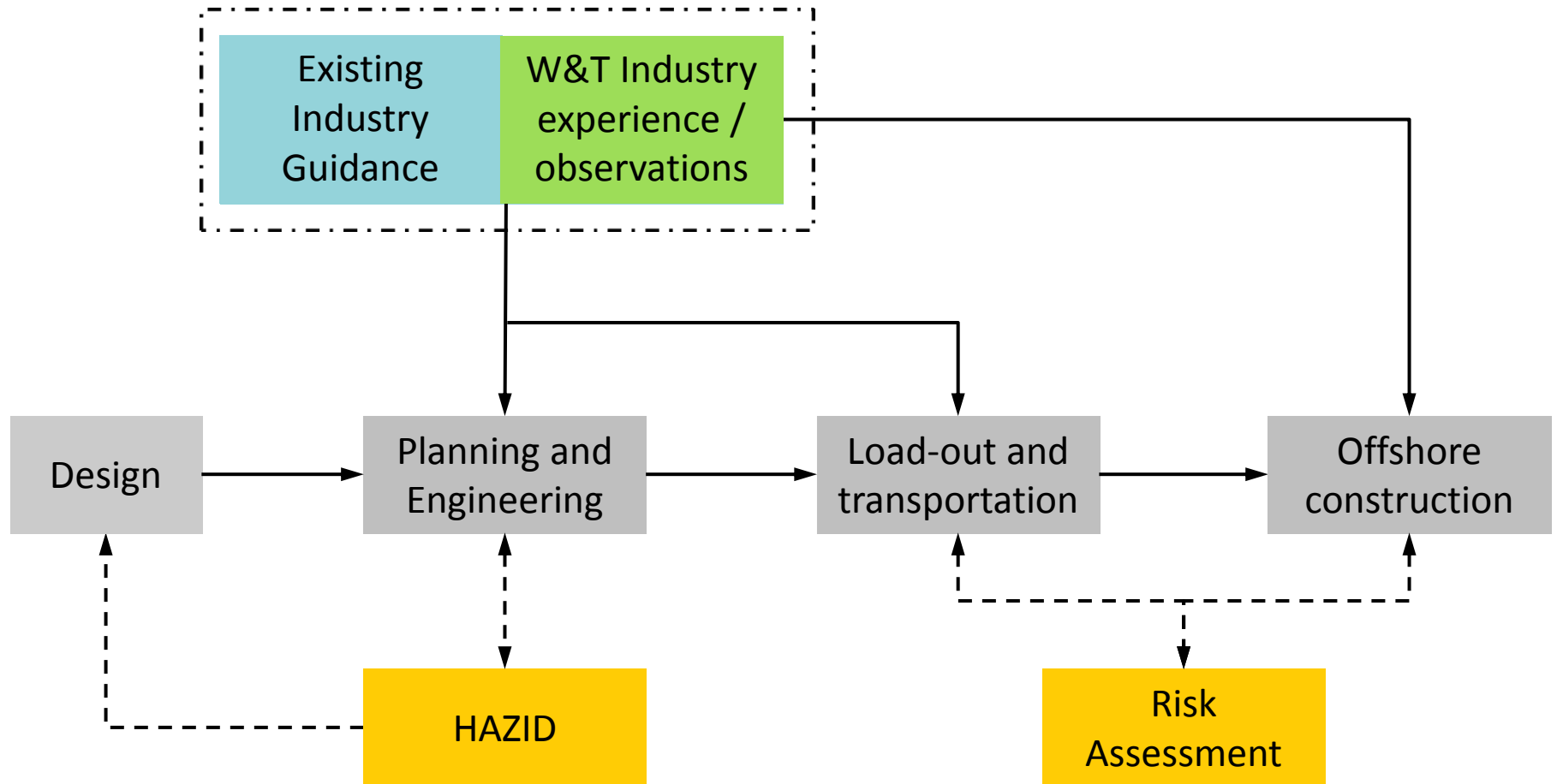
Document should also identify typical methods of construction and how the environment requires special considerations / attention to manage, i.e. strong currents, near shore waves.

We should not re-invent the wheel!



Process map

Guidance should be complementary to existing Best Practise.



HIRA / Risk Assessment

Do we have a generic Risk Assessment procedure within Wave and Tidal?

Do we have a Database of risks and potential mitigating actions?

Should we have a Database and who should be the custodian?

What is the process of contributing to the database?

Best Practise can be built on trends / observations within such a database!

The screenshot shows two windows from a software application. The 'Human Factors Process Tree' window on the left displays a hierarchical list of tasks with associated criticality ratings (e.g., '2. Medium', '1. Low', '3. High'). The 'Human Factors Error Data' window on the right shows a table of error factors (Performance Shaping Factor, Barrier, Control) with their respective impacts (Negative, Moderate). Below these, there are sections for 'Likelihood of Error' (set to 3. Moderate), 'Human Error Probability Notes', 'Effect of Error' (Wheel can become loose and unstable during driving), 'Severity of Effect' (set to 4. High), and 'Likelihood of Effect' (set to 3. Moderate).

		Hazard Severity				
		Negligible Negligible injury, no absence from work	Slight Minor injury requiring first aid treatment	Moderate Injury leading to a lost time incident	High Involving a single death or serious injury	Very High Multiple deaths
Likelihood of Occurrence	Very Unlikely A freak combination of factors would be required for an incident to result	L	L	L	L	L
	Unlikely A rare combination of factors would be required for an incident to result	L	L	L	M	M
	Possible Could happen when additional factors are present but otherwise unlikely to occur	L	L	M	M	H
	Likely Not certain to happen but an additional factor may result in an accident	L	M	M	H	H
	Very Likely Almost inevitable that an incident would result	M	M	H	H	H



Risk Assessment Matrix

Challenge: Can we agree on a generic/default matrix (size) and how we assess probability and consequences?

	Severity				
	1. Negligible	2. Minor	3. Moderate	4. Serious	5. Major
People	No injury or minor first aid	Medical treatment or First aid case	Restricted work case (RWC) Medium Term Health Impact	Lost Time Incident (LTI), Medium Term Health Impact	Serious Injury(s), Death, Disabling injury
Environment	Negligible Impact (<1 litre)	Minor Impact (>1 litre)	Local vicinity impact	Local Impact	Impact Regional Long term local impact
Material Damage	Superficial damage, equipment fit-for-purpose	Observable Damage Assess suitability	Obvious Damage Worksite repair possible	Serious Damage Offsite repair required.	Vital equipment destroyed or unusable
Business Impact	No Media Interest No impact on business	Minor Local Media Interest No impact on business	Local Media Coverage Inventor Notification	National Media Coverage Inventor Concerns	International Media Serious Inventor Concerns
Commercial Impact	<£5,000	£5 - £20k	£20k - £100k	£100k - £500k	£500k +
E. Very Likely Almost inevitable > 1:2	MEDIUM	MEDIUM	HIGH	HIGH	HIGH
D. Likely <1:2 but > 1:10	LOW	MEDIUM	MEDIUM	HIGH	HIGH
C. Potential <1:10 but >1:100	LOW	LOW	MEDIUM	MEDIUM	HIGH
B. Unlikely <1:100 but >1:1000	LOW	LOW	LOW	MEDIUM	MEDIUM
A. Very Unlikely >1:1000	LOW	LOW	LOW	LOW	MEDIUM
HIGH	Task must not proceed where the risk is to people or the environment				
MEDIUM	Task may continue, however control measures must be implemented and extra vigilance taken				
LOW	Task may continue with risk reduce measures implemented.				



Thank you for listening!

