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# Standards for Working with Heavy Duty Marine Equipment

The following sections introduce a high perspective view on health and safety aspects for working with heavy duty marine equipment. In Europe, the standards that apply to offshore wind projects are dependent on the coastal state in whose waters the project is located. Consequently, all countries apply national regulations to activities within their exclusive economic zone (EEZ).

## The EU Directives

The central requirements for working with heavy duty marine equipment is described in the following directives [1]:

- Directive 1989/391/ECC - Framework Directive for Health and Safety at Work
- Directive 2009/104/EC - Use of Work Equipment
- Directive 2006/42/EC - New Machinery Directive

The first two directives stipulates all employers duty to assess the risks workers might face and provide employees with all relevant information on possible health and safety risks and the measures taken to prevent them. Where appropriate, information must be in written form, concerning conditions of use of work equipment, foreseeable abnormal situations and conclusions drawn from experience.

The Machinery directive covers health and safety requirements for manufacturers of machinery, interchangeable equipment, safety-components, lifting accessories, chains, ropes and webbing, removeable mechanical transmission devices and partly completed machinery. Manufacturers of products places in EU must provide a technical document confirming that the equipment meets the requirements in the directive.

## National Health and Safety Legislation

All EU countries are obligated to implement the central EU directives [2]. The legislative requirements of the individual countries are however not the same concerning roles and responsibilities.

As an example, the UK health and safety legislation and guidelines are of high quality and written clearly at a level readily understood by most educated people. The HSE is the body responsible for the encouragement, regulation and enforcement of workplace health, safety and welfare in the UK. Legislation from the HSE and its guidelines are basde on the EU directives

mentioned above, similar to other European countries (member states). However, for all the other EU countries, the legislation has most often been derived from land-based projects, which do not always readily integrate with marine activities and maritime legislation.

### **Industry Guidelines**

The directives do not require any specific permits to work with heavy duty equipment in general. Consequently, operators have formulated industry guidelines to build a common standard for marine safety in the offshore wind industry. Decades of experiences has been consolidated in many industrial bodies, trade associations and non-profit organizations supporting the industry today. A number of these establishments are making tremendous efforts to share their experience in comprehensive guidelines including health and safety. Among these establishments are Wind Europe (formerly known as EWEA, with more than 30 years of experience) and RenewableUK (with more than 40 years of experience). Below is a list of selected guidelines from relevant associations:

- Working the wind safely, guidelines on emergency arrangements including first aid - 2013 [3] Wind Europe (formerly known as EWEA)
- Onshore wind health and safety guidelines - 2015 [4] RenewableUK
- Occupational safety and health in the wind energy - 2013 [5] EU-OSHA
- Environmental, health and safety guidelines for wind energy - 2015 [6] World Bank Group
- Offshore Wind Access - 2018 [7] ECN (energy research centre of the Netherlands, changing name to TNO)
- DNVGL-ST-0054: Transport and installation of wind power plants - 2017 [8] DNVGL

### **Regulatory Standards in India**

Occupational Health and Safety during construction is dealt within the various national legislations under the powers conferred to the respective governments (Federal and Provincial) under Indian Constitution. Most relevant to the offshore / marine construction activities include:

- Dock workers (Safety, Health and Welfare) Act 1986 and Regulations, 1990 [9]
- The building and other construction workers (Regulations of Employment and Condition of Service) Act, 1996 [10]
- The Petroleum and Natural Gas (Safety in Offshore Operations) Rules, 2009 [11]
- The Petroleum and Natural Gas (Code of Practice for Emergency Response and Disaster Management Plan) Regulations, 2010 [12]

In addition, the aspects in relation to navigational safety comes under the preview of Director General of Shipping and various applicable provisions in relation to this are documented in the Shipping Manual [13].

### **Industry Guidelines**

The offshore wind industry in India is at a nascent stage and as such there are no formal institutions who have developed HSE guideline / standards for such industry. Further, given that the major offshore / near shore construction activities are normally undertaken by Oil and Gas companies, Oil Industry Safety Directorate (OISD) [14] has promulgated safety guidelines, which are being followed by marine construction contractors. In relation of offshore marine construction process / equipment, the relevant OISD guidelines include:

- OISD-STD-190: Derrick floor operations (Onshore drilling / workover rigs)
- OISD-STD-192: Safety practice during construction
- OISD-GDN-207: Contractor Safety
- OISD-GDN-218: Guidelines for Safe Rig-up and Rig-down of drilling and workover rigs

- OISD-RP-126: Specific procedures for installation and maintenance of rotating equipment

Although OISD and the above mentioned guidelines have no regulatory status outside Indian Oil and Gas industry, they are widely used as the guidance documents by the contractors involved in marine construction activities.

Apart from the statutory standards, various voluntary standards have been formulated by the Bureau of Indian Standards (BIS) [15] for various activities concerning occupational health and safety. These include:

- BIS Standard - Code of Practice on Occupational Safety and Health Audit (IS-14489:1998)
- BIS Standard - Occupational Safety and Health Management Systems (IS-18001:2000)
- BIS Standard - Hazard Identification and Risk Analysis - Code of Practice (IS:15656:2006)

**For more information, refer the following informative links/materials:**

1. EUR lex : Access to EU-directives (<https://eur-lex.europa.eu>)
2. European Agency for Safety and Health at Work : EU-OSHA is the European Union information agency for occupational safety and health (<http://ohsa.europa.eu>)
3. Working the Wind Safely: Guidelines on Emergency Arrangements including First Aid by EWEA ([http://www.ewea.org/fileadmin/files/library/publications/reports/EWEA\\_HS\\_Guidelines.pdf](http://www.ewea.org/fileadmin/files/library/publications/reports/EWEA_HS_Guidelines.pdf))
4. Onshore Wind Health and Safety Guidelines by RenewableUK ([https://cdn.ymaws.com/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind\\_HealthSafety\\_Guidelines.pdf](https://cdn.ymaws.com/www.renewableuk.com/resource/collection/AE19ECA8-5B2B-4AB5-96C7-ECF3F0462F75/OnshoreWind_HealthSafety_Guidelines.pdf))
5. Occupational Safety and Health in the Wind Energy Sector by EU-OSHA (<https://osha.europa.eu/en/tools-and-publications/occupational-safety-and-health-in-the-wind-energy-sector>)
6. Environmental, Health and Safety Guidelines for Wind Energy by the World Bank Group ([https://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL\\_Aug+2015\\_Wind+Energy\\_EHS+Guideline.pdf?MOD=AJPERES](https://www.ifc.org/wps/wcm/connect/2c410700497a7933b04cf1ef20a40540/FINAL_Aug+2015_Wind+Energy_EHS+Guideline.pdf?MOD=AJPERES))
7. Offshore Wind Access 2018 by ECN (<https://www.ecn.nl/publications/PdfFetch.aspx?nr=ECN-E--17-071>)
8. Standard DNVGL-ST-0054 (<https://rules.dnvgl.com/docs/pdf/DNVGL/ST/2017-06/DNVGL-ST-0054.pdf>)
9. The Dock Workers (Safety, Health and Welfare) Regulations, 1990 ([http://www.dgfasli.nic.in/html/dockact/statutes\\_regul.htm](http://www.dgfasli.nic.in/html/dockact/statutes_regul.htm))
10. The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996 (<https://labour.gov.in/whatsnew/building-and-other-construction-workers-regulation-employment-and-conditions-service-act>)
11. Principles Related to Health, Safety and Environment by Ministry of Petroleum and Natural Gas ([http://petroleum.nic.in/sites/default/files/rule\\_0.pdf](http://petroleum.nic.in/sites/default/files/rule_0.pdf))
12. Codes of Practices for Emergency Response and Disaster Management Plan (ERDMP) (<http://www.pngrb.gov.in/OurRegulation/Others-GSR39.html>)
13. Shipping Manual by Directorate General of Shipping ([http://dgshipping.gov.in/Content/ShippingManual.aspx?menu\\_id=245](http://dgshipping.gov.in/Content/ShippingManual.aspx?menu_id=245))
14. Oil Industry Safety Directorate (<https://www.oisd.gov.in/>)
15. Bureau of Indian Standards (<http://www.bis.org.in/>)

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