

BOEM Update

**Workshop on Offshore Wind Energy Standards and
Guidelines: Metocean Sensitive Aspects of Design and
Operations in the United States**

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Authority for BOEM Regulations

- **Outer Continental Shelf Lands Act (OCSLA), Section 8** (as amended by)
- **Energy Policy Act of 2005, Section 388**
 - authorizes the Secretary of the Interior to regulate OCS activities that produce or support production, transportation, or transmission of energy from *Renewables*.

Regulatory Development

30 CFR 585 – Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf.

<http://www.ecfr.gov>

Existing Regulations – Overview

- 30 CFR Part 585 – Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf
- 30 CFR 585.600, Subpart F – Plans and Information requirements
 - COP – Construction and Operations Plan
 - GAP – General Activities Plan
 - SAP - Site Assessment Plan
- 30 CFR 585.700, Subpart G – Facility Design, Fabrication and Installation.
 - FDR – Facility Design Report
 - FIR – Fabrication and Installation Report
 - CVA – Certified Verification Agent
- 30 CFR 585.800, Subpart H – Environmental and Safety Management
 - SMS
 - Inspections and assessments
 - Incident Reports and Investigations

Plans - COP

- 30 CFR Part 585.620 – What is a Construction & Operations Plan (COP)?
 - COP describes your Construction, Operations and conceptual Decommissioning plans for a **COMMERCIAL** lease.
 - Describes all planned facilities (on and offshore) constructed to support your project
 - Describes all planned activities (Construction, Installation, Operation, Decommissioning)
 - CVA nomination
 - Provides sufficient detail to support all environmental regulatory clearance requirements and to allow thorough review of CVA qualifications and SOW in relation to project specific requirements.
 - COP approval is required prior to beginning any approved activities on a commercial lease.

Plans – GAP and SAP

- 30 CFR Part 585.640 – What is a General Activities Plan(GAP)?
 - GAP describes your Construction, Operations and conceptual Decommissioning plans for a **LIMITED** lease or grant.
 - Describes all planned facilities (on and offshore) constructed to support your project
 - Describes all planned activities (Construction, Installation, Operation, Decommissioning)
 - CVA nomination
- 30 CFR Part 585.605 – What is a Site Assessment Plan(SAP)?
 - SAP describes the activities you plan to perform for the characterization of your commercial lease or to test new technology.
 - Describes how you will conduct your **resource assessment or technology testing**
 - SAP must include data from physical characterization surveys (G&G) and baseline environmental surveys (archeological, biological)
 - If you propose to install facilities that are deemed to be complex and significant by BOEM, you must comply with subpart G and H

Facility Design Report

- 30 CFR Part 585.701 – What must I include in my Facility Design Report (FDR)?
 - provides specific details of the design of all facilities (including cables) listed in your approved COP
 - Cover Letter / Location Plat
 - Front, Side and Plan View Drawings
 - Complete set of structural drawings
 - [Summary of Environmental Data used for your design](#)
 - Summary of the engineering design data
 - Design calculations
 - Detailed description of the loads imposed on your facilities
 - Project specific studies used in your design or installation (Wind, Metocean, G&G)
 - Provides detailed design information to support all necessary technical reviews to ensure overall project safety and survivability.
 - To be reviewed by CVA

Fabrication and Installation Report

- 30 CFR Part 585.702 – What must I include in my Fabrication and Installation Report (FIR)?
 - Describes how your facilities will be fabricated and installed in accordance with the design criteria identified in the FDR and your approved COP, GAP or SAP
 - Cover Letter
 - Schedule / GANNT chart
 - Fabrication Information (QA/QC records, testing results)
 - Installation process information – float plans, lifts plans, work sequencing, etc.
 - Installation reports – final as-built locations, Blow counts, CSR confirmation, etc.
 - Project specific studies used in your design or installation (Transportation analysis, lift/uprighting analysis, weather analysis)
 - Provides detailed information to support all necessary technical reviews to ensure safe and competent fabrication and installation.
 - To be reviewed by CVA

Certified Verification Agent

- 30 CFR Part 585.705 – When must I use a CVA?
 - You must use a CVA to review and certify the Facility Design Report and the Fabrication and Installation Report
 - the CVA must:
 - Ensure your facilities are designed, fabricated and installed in conformance with accepted engineering practices, the Facility Design Report and the Fabrication and Installation Report
 - Provide BOEM immediate reports of all incidents that affect the design, fabrication, and installation of the project or its components
 - As part of the design review, the CVA must conduct independent assessment of all:
 - Planning criteria
 - Operational requirements
 - Environmental loading data
 - Load determinations
 - Stress/fatigue analysis
 - Material designations
 - Soil and foundation conditions
 - Safety factors
 - Other pertinent factors of the proposed design (**wind studies, metocean studies, G&G reports**)

CVA Nomination

- 30 CFR Part 585.706 – How do I nominate a CVA for approval?
 - As part of your COP, you must nominate a CVA for approval
 - You must designate the CVA for the FDR or FIR
 - In the nomination, you must submit:
 - A list of documents that will be reviewed (reports, drawings, etc.)
 - A list of CVA qualifications, including:
 - Personnel qualifications
 - Organizational history, structure, capacity
 - SOW - level of work to be performed by the CVA, the main codes and standards to govern the design, fabrication, installation and verification of the project (IEC 61400-1, IEC 61400-3, IEC 61400-22)

CVA Nomination

- 30 CFR Part 585.706 – How do I nominate a CVA for BOEM approval?(continued)
 - Individuals or organizations acting as CVAs must not function in any capacity that will create a conflict of interest, or the appearance of a conflict of interest.
 - The verification must be conducted by or under the direct supervision of registered professional engineers.
 - BOEM will approve or disapprove your CVA as part of its review of the COP, GAP or SAP.

Safety Management System

- 30 CFR Part 585.810 – What must I include in my SMS?
 - You must describe the SMS you will use with your COP, GAP or SAP You must describe:
 - How you will ensure the safety of personnel or anyone on or near your facilities
 - Remote monitoring, control and shut-down capabilities
 - Emergency Response Procedures
 - Fire suppression equipment, if needed
 - How and when you will test your SMS, and
 - How you will ensure personnel who operate your facilities are properly trained
- 30 CFR Part 585.811 – When must I follow my Safety Management System?
 - Your SMS must be fully functional when you begin activities described in your COP, GAP or SAP.

TRB Reports - recommendations

- CVA Program improvements:
 - Clarify and standardize language
 - Add provisions for CVAs to submit recommendations (lessons learned)
 - Add requirement that lessee submit for approval: DVP, FVP, IVP
 - Reorganize the CVA regulations to make them clearer
- Technical Requirements / Standards Development
 - Develop a set of goal based standards with,
 - A well defined regulatory framework
- SMS, Environment, Safety and Health Improvements
 - Goal based requirements
 - Existing SEMS rule for O&G is a good place to
 - Human Factors Engineering

Feedback – CVA Improvements

- Increase flexibility in the CVA program process:
 - Allow CVA nomination to happen when most advantageous to the developer, provided it meets BOEM minimum requirements
 - Allow submission of individual reports for BOEM/CVA review (ESP, Cabling & Turbines)

TRB Report – CVA Improvements

- Increase specificity in the CVA program requirements (follow the O&G model):
 - Specific reporting requirements for:

LESSEE	CVA	CVA
Design Report	Verification Plan	Verification Report
Fabrication Report	Verification Plan	Verification Report
Installation Report	Verification Plan	Verification Report

- Specifically allow the CVA to consider type certifications in the design verification process (verification of Design Basis)

TRB Report – CVA Improvements

- Increase specificity in the CVA nomination requirements:
 - Specific guidelines for CVA scope of work :
 - Components: blades, RNA, tower, support structure, foundation, cables, connectors, cable crossings, hulls, anchors, moorings, etc.
 - Systems: yaw and pitch controls, mooring, active ballast, firefighting, grounding, other systems affecting structural reliability
 - Design Basis: site assessment (wind, metocean, geophysical, geotechnical), type certifications, local hazard determination
 - Detailed Design: independent verification of computer analysis, load determinations, DLCs, dynamic response, fatigue performance

(based on IEC 61400-22)

TRB Report – Technical Requirements

- Goal Based Standards:
 - AWEA OCRP 2012 sets exposure category for fixed OWTs as such:
 - A medium consequence of failure should be considered as the default exposure category for an OWT support structure as defined by API RP 2A-WSD (e.g., L-2).
 - If the loss of an OWT support structure is likely to cause cessation of a significant portion of power production from the offshore wind facility, then a high consequence of failure (e.g., L-1) criteria may be justified.
 - Electric service platform structures should be designed under criteria for high consequence of failure (e.g., L-1).

Category	SLS	ULS	Annual Exceed.	20-yr Exceed.	Nom. Failure
Medium	50-yr	500-yr	0.002	0.039	0.001
High	100-yr	1000-yr	0.001	0.019	0.0001

TRB Report – Technical Requirements

- Well defined regulatory framework:
 - Incorporate Existing Consensus Guidance into the CFR:
 - IEC 61400-1 Wind Turbines – Part 1: Design Requirements
 - IEC 61400-3 Wind Turbines – Part 3: Design Requirements for Offshore Wind Turbines
 - IEC 61400-22 Wind Turbines – Part 22: Conformity Testing and Certification
 - IEC 60287 series, IEC 60853 series
 - AWEA OCRP 2012 – Recommended Practices for Design, Deployment, and Operation of (fixed) Offshore Wind Turbines in the United States
 - API RP 2A-WSD Recommended Practice for Planning, Designing, and Constructing Fixed Offshore Platforms – Working Stress Design
 - API RP2-GEO, API RP2-SK, API RP2-FPS

(ISO, NORSOK Guides)

TRB Report – Technical Requirements

- Well defined regulatory framework (continued):
 - Incorporate Existing proprietary Guidelines into the CFR:
 - DNV OS-J101 Design of Offshore Wind Turbine Structures
 - DNV OS-J103 Design of Floating Wind Turbine Structures
 - DNV-RP-J101 Use of Remote Sensing for Wind Energy Assessments
 - DNV-RP-C203 Fatigue Design of Offshore Steel Structures
 - DNV-RP-E301 Design and Installation of Fluke Anchors
 - ABS Guide for Building and Classing Bottom-Founded Offshore Turbine Installs
 - ABS Guide for Building and Classing Floating Offshore Turbine Installations
 - ABS Rules for Building and Classing Facilities on Offshore Installations
 - ABS Guide for the Fatigue Assessment of Offshore Structures
 - ABS Guide for Certification of Offshore Mooring Chain

TRB Report – Technical Requirements

- Well defined regulatory framework?
- **Lacking Consensus Document focused on site assessment for OWTs**
 - Wind Resource Assessment
 - Metocean Data Hindcasting, Modelling
 - Geophysical Data Collection and Interpretation
 - Geotechnical Data Collection, Interpretation and Modelling

TRB Report – SMS Improvements

- Rulemaking to adopt a full SMS Rule, based on a clear SMS standard or guidelines.
 - BOEM has begun the process of guideline development by commissioning a TAP study to develop an example SMS and audit criteria/procedures, including a template and checklist for Offshore Wind SMS.
- This TAP Study 709 along with existing BSEE SEMS program from O&G will form the basis of future SMS requirement.

TRB Report – SMS Improvement

- Well defined regulatory framework?
 - **Lacking: Consensus document for SMS program tailored to Offshore Wind.**

Have: Existing O&G SEMS rule to serve as a starting point for our renewable requirements.

Rulemaking - Implementation

- Rulemaking #1 - CVA Program improvements:
 - Currently have a DRAFT rule crafted
 - Undergoing internal review
 - Expect to publish a Notice of Proposed Rulemaking in the Federal Register, first quarter of 2015
 - Will solicit public review and comment at that time
 - All comments will be considered and responded to and incorporated into the rulemaking as appropriate

Rulemaking - Implementation

- Rulemaking #2 – Tech. Requirements / Standards Dev.
 - Working on technical requirements / provisions for preamble to subpart G.
 - Working on list of Design Standards, Practices, Guidelines and Technical notes for inclusion by reference. Assessing the need for augmenting the provisions with specific language.
 - Working on TCs working on maintenance of existing international standards for inclusion of US specific design guidance.
 - Coordinating the development of Standards and Guidance to fill gaps in current state with other agencies and bodies .
 - Begin draft rule as clarity improves with IEC TCs later this year

Rulemaking - Implementation

- Rulemaking #3 – SMS, Environment, Safety and Health Improvements
 - Evaluating the SMS Research report and existing SEMS rule.
 - Formulating specific SMS requirements for Offshore Wind
 - No time table to publish at this time.

Questions?

- Renewable Technology Studies --
[http://www.bsee.gov/Research-and-Training/Renewable-Energy-Research-\(REnR\).aspx](http://www.bsee.gov/Research-and-Training/Renewable-Energy-Research-(REnR).aspx)
- Please take a moment to review the report you each should have gotten as you walked in detailing our Technology Advancement Program activities to date. Those are ongoing and I invite you all to familiarize yourself with our program.