

# Marine High Voltage Safety Training STCW OCSTRI-219 United States Coast Guard

## Course Overview

This course is designed to instruct electrical personnel in the safe working techniques for offshore and onshore industrial high voltage (HV) applications. The course covers the IEC & NEC, IEEE CFR standards for HV switching, electrical isolations, and flash protection boundaries per the NFPA 70E 2012. Our new power generation and distribution simulator instructs technicians in the start-up and troubleshooting of offshore power systems including fundamental system principles and dynamics, bus loading management, distribution to lower voltage electrical networks, HV electrical cabling & stress relief concepts, and other associated electrical applications. The course also offers practical learning, including fully functional HV, and LV units. Testing, Material, Electrical Principals and Stress Utilization & Distribution

## Student Entry Standards

Delegates attending this course should have basic knowledge of electrical practice and/or theory. Technical training in a relevant electrical/ electronic discipline (AAS) or equivalent 2 years practical electrical experience. Limited to 10 Students.

Ratio: 10 Students per Instructor and Proctor

### Scope of Certificate

- Delegates who complete the HV OCSTRI-219 will satisfy;
- The High-Voltage Power Systems training requirements of 46 CFR 11.335(a)(4)(vi) for **STCW** endorsement as an Electro-Technical Officer (ETO).
- The High-Voltage Power Systems training requirements of 46 CFR 12.611(a)(4)(ii) for **STCW** endorsements as an Electro-Technical Rating (ETR).
- The equivalent of the specific TASKs found in the National Assessment Guidelines of the Electro-Technical Officer **NVIC 23-14**.  
1.8.A; 4.1.A; 4.1.B; AND 4.1.C

## Methods

Students will learn through lectures, demonstrations, hands-on learning, practical exercises and discussions. They will be evaluated via attendance, self-assessment, continuous assessment, a theory exam, and a practical test of competency.

## Duration

5 days

## Course Objectives

- Understand the current electrical H.V. Regulations and Standards.
- Understand/perform HV safety and hazards (Arc Flash).
- Understand/perform HV PPE and faults.
- Understand/perform Power Generation, utilization and distribution and documentation (Schematics). Capacitance, resistance and induction.
- Understand HV systems, components and protection RC curves and device parameters.
- Understand the electrical stresses and phenomena.
- Understand/perform the different types of HV testing.
- Understand/perform HV Switching and isolation and Grounding.
- Understand HV Cabling, terminations, spicing and Bracing, including faults and stresses.

## Topics Overview

- Electrical Safety Standards & Laws, HV terminology, system component identification and functions Arc Flash Protection Boundaries & appropriate PPE.
- Distribution component-switchgear and transformers, isolations, switching and safety
- Core electrical principles and concepts. Static and dynamic behavior of electrical fields and electrostatics, generation and coupling: especially with concerns of material behavior in strong electric fields (stresses), physical and electrical forces and phenomena.
- Alternators and voltage regulation, Speed control Synchronization Power system distribution and dynamics (P.F, KVAR, KW, KWA).
- PTW, Risk Assessments, Switching plans and Black Start Procedures. Testing for Dead (practical assessment).
- High Voltage cabling and electrical stress relief, capacitance, dielectrics, energy storage and RC time curves. Cable terminations, splices, repairs and bracing.
- Hi-Pot and IRT testing, Specialized electrical testing, High Resistance insulation testing, 4-wire Kelvin testing, Corona and Partial discharge tests. Short Circuit and fault current analysis methods and calculations of fault energy. Circuit protection components and coordination, TCC curves and setting device parameters.

## Certification

- Course Certificate upon successful practical and theoretical completion.



15330 Park Row, Houston, TX 77084 Phone: 281.579.1066 Fax: 281.579.0084

[www.ocsgroup.com](http://www.ocsgroup.com) \* [training@ocsgroup.com](mailto:training@ocsgroup.com)

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