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# IEEE Recommended Practice for 1 kV to 35 kV Medium-Voltage DC Power Systems on Ships

IEEE Industry Applications Society

Sponsored by the
Petroleum and Chemical Industry Committee

IEEE
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**Petroleum and Chemical Industry Committee**
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Approved 17 June 2010

**IEEE-SA Standards Board**

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**Abstract:** Guidelines to specify, procure, design, manufacture and develop manuals, safety procedures, practices and procedures for effective maintenance of medium-voltage direct current (MVDC) electrical power systems is discussed in this recommended practice. Recommendations are made for analytical methods, preferred interconnection interfaces and performance characteristics for reliable integration of MVDC electrical components into the ship MVDC electrical power systems.

**Keywords:** integrated power systems, marine electrical-power systems, medium-voltage DC, MVDC power electronics, power-electronic building blocks

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## Introduction

This introduction is not part of IEEE Std 1709-2010, IEEE Recommended Practice for 1 kV to 35 kV Medium-Voltage DC Power Systems on Ships.

The purpose of this recommended practice is to provide a set of guidelines that can be used by the of medium-voltage DC (MVDC) Power systems stakeholders to specify, procure, design, manufacture and develop manuals, safety guidelines, practices and procedures for effective maintenance of their MVDC system. It is not intended that these recommended practice form the basis for a mandatory standard. Acceptance or rejection of any or all of the recommendations contained herein is left to the discretion of the individual agency, which should determine their applicability to its proposed or existing operating practices and procedures.

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The following members of the individual balloting committee voted on this recommended practice. Balloters may have voted for approval, disapproval, or abstention.

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# IEEE Recommended Practice for 1 kV to 35 kV Medium-Voltage DC Power Systems on Ships

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## 1. Overview

This recommended practice addresses specific aspects of shipboard medium-voltage DC (MVDC) power systems and defines recommended practice for applying contemporary technologies to convert and distribute shipboard electrical power with improved reliability, survivability, and power quality. It is not intended in any way to impede development of new or improved techniques.

Target users for this recommended practice are evaluators and designers of electrical power systems for commercial marine and military applications, commercial and military ship end-users, shipbuilders, port operators, classification societies, machinery and equipment manufacturers, research institutes, and universities.

### 1.1 Scope

This recommended practice is based on current electrical engineering methods and practices for applying 1 kV to 35 kV MVDC power distribution and DC power delivery systems on ships. Recommendations are made for analytical methods, preferred interconnection interfaces and performance characteristics for reliable integration of MVDC electrical components into the ship electrical power systems.

### 1.2 Purpose

The purpose of this document is to recommend a methodology for analysis and specifications parameters for 1 kV to 35 kV MVDC power systems on ships. It will describe impact of MVDC on all electrical


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