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Ships and marine technology — Hopper dredger supervisory and control systems

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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This document was prepared by Technical Committee ISO/TC 8, *Ships and marine technology.*

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

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Introduction

This document describes the supervisory and control system for a number of components, functions and systems that can, but do not have to, be installed on board of a hopper dredger. It does not prescribe that all described components, functions and systems need to be installed.

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Ships and marine technology — Hopper dredger supervisory and control systems

1 Scope

This document specifies the components and structure, general requirements, and functional requirements of trailing suction hopper dredger supervisory and control systems.

It is applicable only to the installed components, functions or systems. It covers design, manufacture and modification.

2 Normative references

The following referenced documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 8384, *Ships and marine technology — Dredgers — Vocabulary*

3 Terms, definitions and abbreviated terms

3.1 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 8384 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1.1
hopper dredger supervisory and control system
HD-SCS
system used for supervising and controlling the dredging operations of a hopper dredger

3.1.2
suction tube position monitor
STPM
system used for supervising and controlling the suction tube operation, displaying the movement and position of the suction tube

3.1.3
depth of draghead
distance from the water surface to the lower edge of the draghead

3.1.4
draught and soil loading system
DSLS
system used to display and record the draught and soil load

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3.1.5
light ship weight
displacement of the hopper dredger, while the hopper is empty and the bottom doors are closed

Note 1 to entry: It represents the weight of the ship before each dredging.

3.1.6
light mixture overboard
LMO
controller used to discharge the mixture overboard directly when its concentration is too low

3.1.7
suction tube winch controller
STWC
controller used to move the suction tube to the specified position or to hold the position automatically

3.2 Abbreviated terms

DSLS	Draught and soil loading system
HD-SCS	Hopper dredger supervisory and control system
HMI	Human machine interface
LMO	Light mixture overboard
PLC	Programmable logic controller
SCADA	Supervisory control and data acquisition
STPM	Suction tube position monitor
STWC	Suction tube winch controller

4 Components and structure

4.1 Components

A hopper dredger is a self-propelled dredger with its own integrated hopper hold.

An HD-SCS, according to this document, is a basic system for supervising and controlling the dredging operations performed by a hopper dredger utilising sensors, networks, computers, and technologies concerning measurement, communication and automation.

An HD-SCS is an integrated SCADA system that can consist of the following subsystems, based on their functions.

a) STPM/STWC: STPM/STWC monitor excavation process. It should involve the monitoring and control of the suction tube, gantry, draghead, winch, swell compensator and other equipment. The STPM/STWC includes the suction tube vertical/horizontal angle, visor angle, swell compensator position, and valve/gantry state sensors.

b) DSLS: DSLS monitor loading process. It should involve the monitoring and control of overflows, light mixture overboard valve, loading valve and other equipment. The DSLS includes the dredger draught, hopper level, trim/heel, mixture density, mixture flow, overflow position, and valve state sensors.

c) Unloading system: unloading system monitor bottom dumping, rainbow/shore discharging process. It should involve the monitoring and control of the bottom door, split-system pre-dumping

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