



GUIDANCE NOTES ON

STATIONKEEPING OPERATIONS OF SELF-ELEVATING UNITS EQUIPPED WITH DYNAMIC POSITIONING SYSTEMS

AUGUST 2018

**American Bureau of Shipping
Incorporated by Act of Legislature of
the State of New York 1862**

**© 2018 American Bureau of Shipping. All rights reserved.
ABS Plaza
16855 Northchase Drive
Houston, TX 77060 USA**

Foreword

These Guidance Notes provide technical recommendations and guidance on the operation of the elevated DP unit while approaching and leaving the location, with a specific focus on the effects of DP capability during lowering/lifting legs and during touch down.

The number of elevated units in use equipped with Dynamic Positioning (DP) systems for position keeping is increasing. These units use DP while approaching and leaving the operation location. Compared to conventional floating units with DP systems, elevated units have unique characteristics when operating in DP mode, such as the leg effect during lowering down, raising up, and touching down.

These Guidance Notes are intended to be used in conjunction with the *ABS Guide for Dynamic Positioning Systems*.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of these Guidance Notes is the most current.

These Guidance Notes become effective on the first day of the month of publication.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.

Terms of Use

The information presented herein is intended solely to assist the reader in the methodologies and/or techniques discussed. These Guidance Notes do not and cannot replace the analysis and/or advice of a qualified professional. It is the responsibility of the reader to perform their own assessment and obtain professional advice. Information contained herein is considered to be pertinent at the time of publication, but may be invalidated as a result of subsequent legislations, regulations, standards, methods, and/or more updated information and the reader assumes full responsibility for compliance. This publication may not be copied or redistributed in part or in whole without prior written consent from ABS.



GUIDANCE NOTES ON

STATIONKEEPING OPERATIONS OF SELF-ELEVATING UNITS EQUIPPED WITH DYNAMIC POSITIONING SYSTEMS

CONTENTS

SECTION 1	Introduction	1
1	General	1
3	Objective	1
5	Definitions	1
SECTION 2	DP Operations for SEUs	2
1	DP Operational Documentation	2
1.1	General.....	2
1.3	Recommended Documentation	2
3	DP Class	2
5	DP FMEA	2
7	DP Capability Plots	3
9	DP Footprint Plots.....	3
11	DP Control Modes for Self Elevating Units	4
13	DP Operations Manuals.....	4
15	Recommended Procedures for DP Self Elevating Vessel Going On and Off Location.....	4
15.1	Procedure for DP Self Elevating Vessel Going on Location	4
15.3	Procedure for DP Self Elevating Vessel Leaving Location	5
APPENDIX 1	DP Capability Plots – SEU #1	6
TABLE 1	SEU #1 Main Particulars.....	7
TABLE 2	SEU #1 Thruster Parameters.....	7
FIGURE 1	Generic SEU #1 Schematic	6
FIGURE 2	DP Capability Plot for Current Speed of 1 Knot.....	8
FIGURE 3	DP Capability Plot for Current Speed of 2 Knots	8

APPENDIX 2	DP Capability Plots – SEU #2	9
TABLE 1	SEU #2 Main Particulars	10
TABLE 2	SEU #2 Thruster Parameters.....	10
FIGURE 1	Vessel Schematic.....	9
FIGURE 2	SEU #2 DP Capability Plot for Current Speed at 2 Knots.....	11
FIGURE 3	SEU #2 DP Capability Plot for Current Speed at 4 Knots.....	11
APPENDIX 3	Acronyms	12
APPENDIX 4	References	13



SECTION 1 Introduction

1 General

These Guidance Notes provide guidance for the effective management of DP operations for Self-Elevating Units (SEU). This document is not meant to replace or supersede any rules, regulations, or operational manuals. The information presented here is compiled from various industry sources and from experience not previously available in the public domain. This document is not intended to address all aspects of DP operations for SEUs, but rather presents a collection of best practices with a focus on important DP operational themes aimed at effective DP operations and a reduction in DP related incidents.

Self-elevating units (SEUs) equipped with dynamic positioning systems include units for construction, wind turbine IMR (installation, maintenance, and repair), accommodation, well services, and other non-drilling activities. The term 'liftboat' is sometimes used in some geographic areas or by some companies to describe SEUs. Thus the DP operations for SEUs are typically limited to repositioning operations and jacking operations. This document provides guidance on these specific operations.

3 Objective

These Guidance Notes were created to provide guidance on the effective DP operations of SEUs. The following subjects are addressed in this document:

- DP class
- FMEA/FMECA
- DP Capability Plots
- DP Footprint Plots
- Modes of Operations
- Operation Manuals

5 Definitions

DP System: Components and systems acting together to achieve reliable position keeping capability. The DP system includes the power system (power generation and power management), thruster system and DP control system.

DP Control System: All control components and systems, hardware and software necessary to dynamically position the vessel. The DP control system comprises computer systems, sensors, display systems, position reference systems and associated cabling and routing.

DP Capability Plots: These define by theoretical calculation the vessel's ability to maintain position in various environmental conditions, (i.e., wind, sea state and current). It considers external forces including pipe tension, thruster and power configurations.

DP Footprint Plots: Plots detailing the vessel's DP stationkeeping performance and limitations in various environmental conditions (wind, sea state and current). It considers external forces including pipe tension, thruster and power configurations. These are created by observation onboard the vessel in real time conditions.

FMEA: A systematic analysis of systems and sub-systems to a level of detail that identifies all potential failure modes down to the appropriate sub-system level and their consequences.



SECTION 2 DP Operations for SEUs

1 DP Operational Documentation

1.1 General

It is recommended that DP vessel owners/operators maintain the documentation listed in Table 1, below and develop and implement associated processes so as to:

- Achieve sound and effective management of the vessel in DP
- Achieve technical suitability of the vessel for each DP activity to be carried out
- Determine the configuration for the mode of operation
- Understand the vessel's station keeping capabilities following the worst case failure
- Comply with appropriate standards and guidelines
- Provide training and familiarization material to vessel crews

1.3 Recommended Documentation

A full list of recommended documentation can be found in Section 3 of Marine Technology Society (MTS) DP Operations Guidance Part 2 Appendix 1.

Specific to DP SEUs, documentation for DP footprint plots may be different for typical DP vessels due to the difficulty of recreating the conditions assumed when developing the DP capability plots.

3 DP Class

MTS DP Operations Guidance Part 2 Appendix 1 recommends a minimum of Class 2 level for DP Equipment for a DP Vessel with logistics operations applications. For self-elevating units, the most common DP operations are repositioning and jacking. The primary function of a SEU is not realized until the vessel has been fully deployed and jacked into position. Thus, functions such as drilling and crane operations should not be considered for the DP system. Due to this limited scope of DP operations, the notation **DPS-2** is recommended for DP SEUs.

5 DP FMEA

The *ABS Guide for Dynamic Positioning Systems* can be used for the FMEA of the DP systems. MTS DP Operations Guidance Part 2, Appendix 1 provides a concise overview of the underlying philosophy, analytical processes, and technical content of a DP FMEA for DP MODUs. Similarly, International Marine Contractors Association (IMCA) M166 and M04/04 detail the considerations taken during the development of the DP FMEA.

Development and use of DP FMEAs for SEUs should mirror those for MODUs. Additional consideration should be given to jacking and repositioning operations while operating in dynamic positioning mode.