	TECHNICAL SPECIFICATION		Nº	I-ET-3010.00-1351-140-P4X-001		
	CLIENT:				SHEET: 1 of 6	
	PROJECT:				-	
	UNIT:					
DP&T-SUP	TITLE: HULL GLOBAL DEFLECTION				NP-1	
					ESUP	

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INDEX OF REVISIONS

REV.	DESCRIPTION AND/OR REVISED SHEETS
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0	ORIGINAL
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	REV. 0	REV. A	REV. B	REV. C	REV. D	REV. E	REV. F	REV. G	REV. H
DATE	DEC/28/18								
DESIGN	ESUP								
EXECUTION	ESLFIGUEIREDO								
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1. MAIN OBJECTIVE

This document presents the minimum information requirements of hull global deflection in consequences of FPSO hull global loads for different scenarios.

This document is applicable only for FPSOs Units.

A report shall be submitted considering hull global deflections.

Wave bending moments shall be in accordance with 100 years return period waves for intended site.

2. MINIMUM INFORMATIONS

Hull global deflections shall be presented, at least, for all cargo region. From forward engine room transverse bulkhead to forward peak tank transverse bulkhead, hull global deflection shall be presented for each frame.

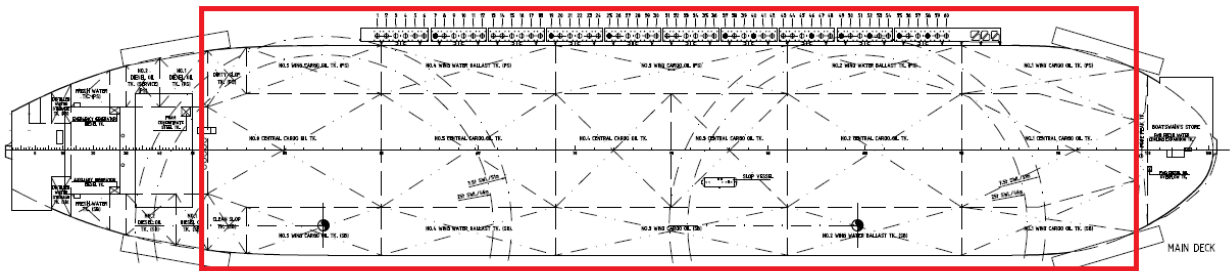


Figure 1 – Cargo Region

Midship sectional properties shall be presented on report as shown on [Table 1](#)~~Table 4~~.

Table 1 – Midship Sectional Properties

SECTIONAL PROPERTIES	
Gross area of cross-section	x.xxx m ²
Moment of inertia / GY axis	x.xxx m ⁴
Moment of inertia / GZ axis	x.xxx m ⁴
Neutral axis (above base line)	x.xxx m
Section modulus at deck	x.xxx m ³
Section modulus at bottom	x.xxx m ³

It is recommended to consider Hull Girder sectional properties for each frame. Also, it is recommended to consider the total bending moment (Stillwater plus Wave Bending Moment) corresponding for each frame.

2.1. DEFLECTIONS

Hull global deflection shall include vertical deflections, longitudinal deflections and transversal rotation. Longitudinal deflection shall be calculated at main deck centerline.

Deflections shall be presented as absolute value.

Euler-Bernoulli Theory may be accepted for deflection calculation.

Deflections can be calculated considering primary stresses only. Secondary and tertiary stresses may be neglected for deflections calculation.

2.2. SCENARIOS

Deformations shall be presented for several different scenarios as presented on [Table 2](#)~~Table 2~~.

Table 2 – Minimum Scenarios

SCENARIOS
STATIC
DESIGN EXTREME CONDITION - HEAD SEA
DESIGN OPERATIONAL CONDITION - HEAD SEA
DESIGN EXTREME CONDITION - QUARTERING SEA
DESIGN OPERATIONAL CONDITION - QUARTERING SEA
DESIGN EXTREME CONDITION - BEAM SEA
DESIGN OPERATIONAL CONDITION - BEAM SEA
DYNAMIC ONLY
DAMAGE
TRANSIT

If no information regarding these conditions is available, [Table 3](#) presents a proposed Stillwater and wave bending moments for each scenario.

Table 3 – Proposed Loads Scenarios

SCENARIOS	STILLWATER	WAVE BENDING
STATIC	100%	0%
DESIGN EXTREME CONDITION - HEAD SEA	100%	100%
DESIGN OPERATIONAL CONDITION - HEAD SEA	100%	75%
DESIGN EXTREME CONDITION - QUARTERING SEA	100%	75%
DESIGN OPERATIONAL CONDITION - QUARTERING SEA	100%	60%
DESIGN EXTREME CONDITION - BEAM SEA	100%	40%
DESIGN OPERATIONAL CONDITION - BEAM SEA	100%	30%
DYNAMIC ONLY	0%	100%
DAMAGE	100%	75%
TRANSIT	30%	125%

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ANNEX

Spreadsheet annexed below is an example calculation.



PROPOSED HULL
GLOBAL DEFLECTION.