

Group Practice



GP 65-30

Weight Control for Floating Production Facilities (ISO 19901-5)

16 March 2010
Engineering Technical Practice
Engineering

Table of Contents

	Page
Foreword	4
Introduction	5
1. Scope	6
2. Normative references	6
3. Terms, definitions, and abbreviated terms	6
3.2 Abbreviated terms	6
4. Weight control classes	7
4.1 General	7
5. Weight and load budget (WLB)	7
5.1 General	7
5.2 Requirements	7
5.3 Weight and load budget (WLB) content	7
6. Weight reporting	10
6.1 General	10
6.2 The weight control procedure	10
6.3 Requirements to the weight report	13
7. Requirements for weight data from suppliers and weighing of bulk and equipment	13
7.1 General	13
8. Requirements for weighing of major assemblies	14
8.3 Weighing	14
10. Displacement check and inclining test	14
11. Weight management during installation	15
11.1 General	15
11.2 Tracking ballast	15
11.3 Tracking mooring and riser loads	16
11.4 Tracking weight of temporary installation equipment	16
11.5 Draught measurement	16
12. Weight management during operation	16
12.1 General	16

Copyright © 2010 BP International Ltd. All rights reserved.

This document and any data or information generated from its use are classified, as a minimum, BP Internal. Distribution is intended for BP authorized recipients only. The information contained in this document is subject to the terms and conditions of the agreement or contract under which this document was supplied to the recipient's organization. None of the information contained in this document shall be disclosed outside the recipient's own organization, unless the terms of such agreement or contract expressly allow, or unless disclosure is required by law.

In the event of a conflict between this document and a relevant law or regulation, the relevant law or regulation shall be followed. If the document creates a higher obligation, it shall be followed as long as this also achieves full compliance with the law or regulation.



12.2	Weight reconciliation and phantom weight	17
12.3	Permanent weight additions	17
12.4	Temporary weight additions	17
12.5	Drilling, completion, and workover variable loads.....	17
13	Weight and buoyancy bookkeeping	18
Annex G (Informative) Guidance on lightship weight definition.....		19
G.1.	Items included in lightship weight.....	19
G.1.1	Steel structure.....	19
G.1.2	Marine and utility systems.....	19
G.1.3	Process systems.....	20
G.1.4	Drilling systems.....	20
G.1.5	Subsea systems	21
G.1.6	Well systems.....	21
G.2.	Items not included in lightship weight.....	21
G.2.1	Water ballast.....	21
G.2.2	Deck payload	21
G.2.3	Drilling variable loads.....	22
G.2.4	Hull payload	22
G.2.5	Marine loads	23

List of Tables

Table 2 - Suggested weight contingencies (%) to add to weight estimates	8
---	---

List of Figures

Figure 2 - Example of a two dimensional CoG envelope and CoG history	9
Figure 3 - Example of weight estimation via comparable parameters.....	11
Figure 4 - Determination of installation's North.....	12
Figure 5 - Coordinate system for TLP and semisubmersible	12
Figure 6 - Coordinate system for monohulls.....	13



Foreword

This is the first issue of Engineering Technical Practice (ETP) GP 65-30.

This Group Practice (GP) is based on parts of heritage documents from the merged BP companies as follows, (n.b. this ETP has now been withdrawn):

British Petroleum

GIS 65-215

Floating Production Facility Weight Control (ISO 19901-5)



Introduction

- a. Requirements for weight control are based on ISO 19901-5: 2003 “Petroleum and natural gas industries - Specific requirements for offshore structures - Part 5: Weight control during engineering and construction”.
- b. Requirements of this GP are modifications to ISO 19901-5: 2003.
- c. Modifications to ISO 19901-5: 2003 are identified as Add, Modify to Read, or Delete.
- d. Paragraph numbers in this specification correspond to ISO 19901-5: 2003.
- e. Paragraphs of ISO 19901-5: 2003 that are not revised remain applicable.
- f. Additional requirements are designed to improve safety, environmental integrity, long-term structural integrity, and production efficiency of floating structures. They are based on recent experience with BP’s floating structures and international regulations, Classification Society Rules and industry best practice.



1. Scope

Add

- a. This GP provides group practice for the design, construction, and installation of:
 1. Floating production and/or storage facilities (i.e., monohull such as FPSOs, FSUs, semi-submersibles, and tension leg platforms).
 2. Items/features of the floating production facility structure that have a significant effect on the structural weight (e.g., hull, topsides, drilling/workover equipment, moorings, and riser mass/tension).

Spar structures have not been included in this GP as they are currently covered under STPs produced by the Gulf of Mexico SPU. For information on weight control of Spars, contact the segment Marine Authority (Engineering and Naval Architecture).
- b. This GP does not apply to fixed (bottom-founded) platforms.
- c. This GP applies through all project phases (engineering, construction, transportation, installation) and operational phases.

2. Normative references

Add

ASTM F1321	Standard Guide for Conducting a Stability Test (Lightweight Survey and Inclining Experiment) to Determine the Light Ship Displacement and Centers of Gravity of a Vessel.
------------	---

3. Terms, definitions, and abbreviated terms

3.2 Abbreviated terms

Add

AFC	Approved for construction.
CAD	Computer aided design.
FPSO	Floating production, storage, and offloading.
FSU	Floating storage units.
HVAC	Heating and ventilating and air conditioning.
RCS	Recognised Classification Society.
SCR	Steel catenary riser.
SPU	Strategic performance unit.
STP	Site Technical Practice.
TEG	Triethylene glycol.
VCG	Vertical centre of gravity.



4. Weight control classes

4.1 General

Add

- a. Column-stabilised facilities (e.g., semi-submersibles and TLPs) shall be Class 'A': High definition of weight and CoG requirements.
- b. Mono-hull type facilities (e.g., FPSOs) shall, as a minimum, be Class 'B': Medium definition of weight and CoG requirements.

Floating production units with minimal storage capability tend to be weight sensitive and thus require regular updating and assessment of weight. Floating structures with significant storage capacity are generally less weight sensitive, one exception being where substantial topside processing equipment gives rise to concerns over vertical CoG and associated stability. In such instances, Class 'A' weight control definition should be adopted.

5 Weight and load budget (WLB)

5.1 General

Add to Table in Class A

- a. Discipline engineers shall be made aware of:
 - 1. Importance of optimising design to manage the WLB.
 - 2. Impact that optimising design will have on overall facility size and cost.
- b. Payload changes shall be identified by discipline engineers in a timely manner to all project engineers, to take advantage of any savings and enable the design to proceed without major revisions to the weight budget.
- c. The weight management process should not compromise the selection of equipment that is appropriate for the expected field life and maintenance regime.

5.2 Requirements

Add to Table in Class A

Revisions to WLBs shall be processed through the project's management of change process.

5.3 Weight and load budget (WLB) content

5.3.1 General

Add to Table in Class A

Weight allowances and contingencies in Figure 1 ensure that:

- a. Excessive margins are not built in.

Excessive in this instance can be determined by comparing contingencies and allowances with other similar projects.

- b. If the design of small cable trays, piping, etc., is to be left to the construction yard, appropriate weight margins are included.

An example of appropriate weight contingencies used in the Gulf of Mexico is given in Table 2. This table indicates the percentage contingency which may be added to the estimated weight of any item within each design discipline, dependent on the method of weight estimation.