Floating Systems Integrity Management

API RECOMMENDED PRACTICE 2FSIM
FIRST EDITION, SEPTEMBER 2019

AMERICAN PETROLEUM INSTITUTE

Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to ensure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be utilized. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

Users of this recommended practice should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue, NW, Washington, DC 20001. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, NW, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Washington, DC 20001, standards@api.org.

Contents

Page

Figures

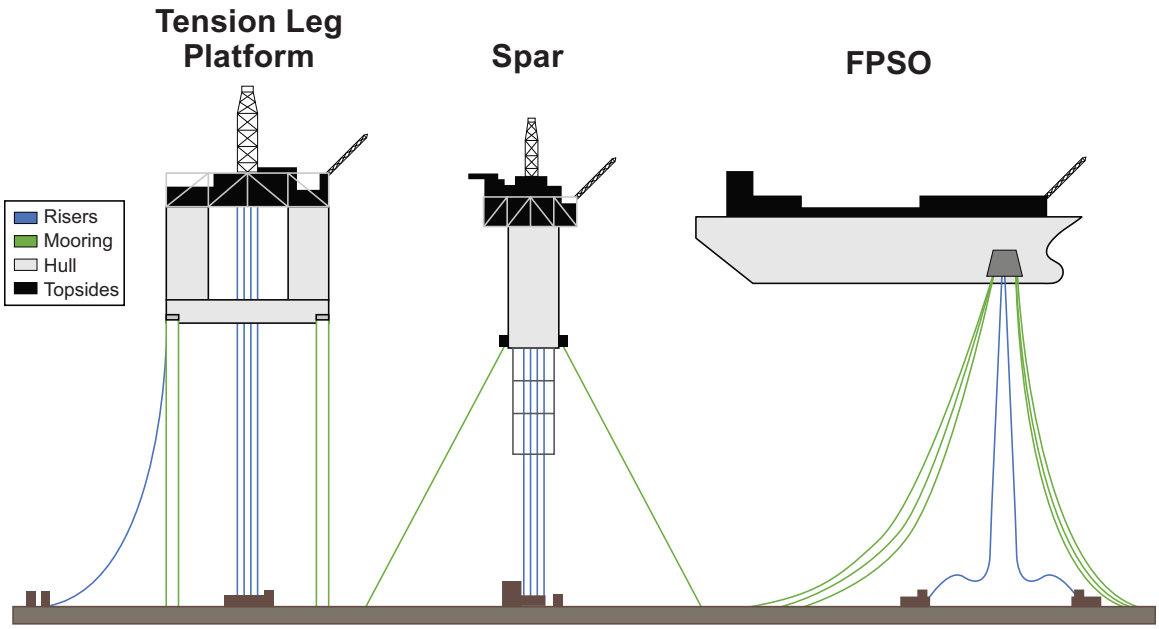
Tables

Introduction

This recommended practice (RP) is one of three additions to API's portfolio of offshore floating structures standards that address integrity management (IM) of floating systems (API 2FSIM), mooring systems (API 2MIM), and riser systems (API 2RIM).

This RP is intended to be used by owners and engineers in the development, implementation, and delivery of a process to maintain system integrity of floating production systems (FPSs), including tension leg platforms (TLPs). The specifications, procedures, and guidance provided herein are based on internationally recognized industry standards and on global industry best practices.

API's existing suite of recommended practices such as API 2FPS, API 2T, API 2SK, API 2RD, and API 2SIM address several aspects of life cycle integrity management expectations, and the three new standards add to that suite by capturing experiences from owners, operators, integrity management specialists, recognized classification societies (RCSs), and regulators, establishing a common framework for IM for FPSs. The figure below depicts the interfaces between the hull and mooring and risers for various types of FPSs and the IM standard that addresses the specific systems.



Physical Interfaces between API IM Standards

Implementation of effective integrity management for floating systems requires an understanding of the interfaces between the hull, mooring, and risers and how they translate to stewardship of IM activities in the field. The new standards have been developed with the objective of recognizing and identifying key interfaces, and they emphasize the criticality of a systems level approach.

By having a consistent systems level approach and by pursuing a risk-based framework to develop, evaluate, plan, and implement an integrity management program for a floating system, the user can tailor the IM program around the unique design drivers, in-service and operating conditions while conforming to the owner's organizational safety, health and environment risk management policies and regulatory requirements.

Floating Systems Integrity Management

1 Scope

This recommended practice (RP) provides guidance for floating system integrity management (FSIM) of floating production systems (FPSs), which include tension leg platforms (TLPs), used by the petroleum and natural gas industries to support drilling, production, storage, and/or offloading operations.

FPSs described in this RP are governed by local regulatory requirements and recognized classification society (RCS) rules (if classed). No specific regulatory compliance or RCS requirements are restated in this RP. The requirements of this RP do not apply to mobile offshore drilling units (MODUs) or to mobile offshore units (MOUs) used in support of construction operations. For integrity management (IM) considerations, these units are typically governed by RCS rules, and include, among others:

— floating systems intended primarily to perform drilling and/or well intervention operations even when used for extended well test operations;

— floating systems used for offshore construction operations (e.g. crane barges or pipelay barges), for temporary or permanent offshore living quarters, or for transport of equipment or products (e.g. transportation barges, cargo barges); for these, see appropriate RPs.

This RP does not address moorings or risers; these are addressed separately by API 2MIM and API 2RIM, respectively. Dynamic positioning is not covered in this RP.

The following types of floating systems are explicitly covered by this RP:

— ship-shaped floating systems and barges (monohull or otherwise);

— semisubmersibles;

— spars;

— tension leg platforms (TLPs), including tendon systems.

The following types of floating system components are included within the context of this RP:

— hull structure, including above water, below water, and internal (i.e. hull compartments) structure and corrosion protection systems (e.g., coatings, cathodic potential, etc.);

— structural systems, such as turrets, topsides structure, helidecks, flares, cranes, and process decks, and their interfaces with the hull structure;

— mooring system support structure on the hull (e.g. foundations for chain jacks, fairleads, chain stoppers, etc.)

— tendon systems, including foundations;

— marine systems, such as ballast, bilge, venting, soundings, firefighting systems, cargo systems, emergency power, propulsion, steering, sensors, alarms, and controls (vessels in transit are not included);

— permanent means of access and egress, including walkways, grating, handrails;

— structural interfaces between hull structure and riser system;