Integrity Management of Risers from Floating Production Systems

API RECOMMENDED PRACTICE 2RIM
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Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Washington, DC 20001, standards@api.org.

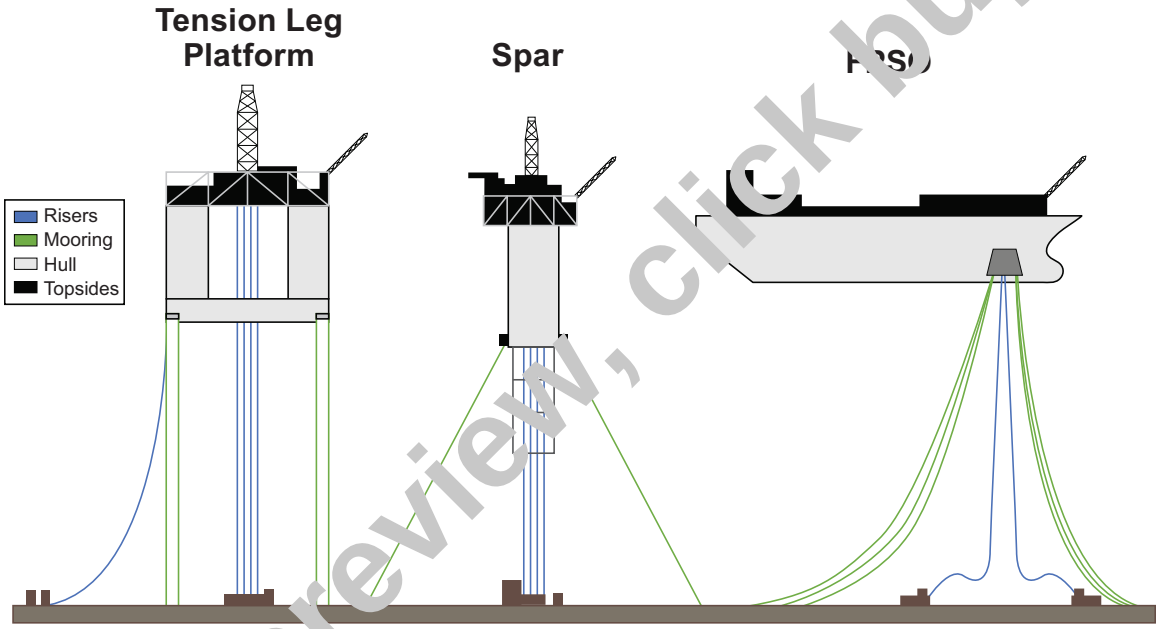
Contents

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 RPs 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.

Integrity Management of Risers from Floating Production Systems

1 Scope

This recommended practice (RP) provides guidance for the integrity management (IM) of risers connected to a permanent floating production system (FPS) used for the drilling, development, production, and storage of hydrocarbons in offshore areas.

A riser is typically part of a larger subsea system extending from a wellhead, tree, manifold, template, or other structure on the seabed, to a boarding valve or pig trap on the host platform's topsides. This RP addresses the integrity management of the dynamic portion of the riser system.

For the purposes of this RP, a riser has a top boundary that is somewhere at or above the point where it transfers load to the platform structure, and it has a lower boundary where it transfers load into a foundation, which could be a wellhead, pipeline, or subsea structure.

For a top-tensioned riser (TTR), the top boundary would typically be the tensioner system hang-off point, and the bottom boundary would be the wellhead. For a steel catenary riser (SCR), the top boundary would typically be the stress joint or flexible joint. Some unusual configurations such as pull-tube SCRs merit special consideration. The top boundaries of a flexible or hybrid riser are typically a flanged connection to the riser end fitting at the top of an I-tube or J-tube, and a bend stiffener at the bottom of a I-tube or J-tube.

The IM of the structural support for a riser on the host platform is in the scope of API 2FSIM, although some hybrid configurations, such as pull tubes, can require overlapping riser and structural IM.

For risers structurally connected to the platform below the topsides, hull piping can be structurally clamped to the hull up to a boarding valve or pig launcher at the topsides. This is intended to be considered as part of the riser in terms of IM, although it also has structural elements addressed in API 2FSIM.

The scope of this RP includes:

— structural components of the riser;

— riser top hang-off assembly (i.e. stress joint, flexible joint, tensioner system/air can, bend stiffener);

— appurtenances attached to the riser that are critical to its integrity, including VIV suppression devices and buoyancy modules used to support the riser in any capacity;

— corrosion protection systems;

— insulation;

— other components in the load path or supporting the riser.

The scope of this RP specifically does not include:

— structural support for the riser on the host platform (i.e. riser porch, pull tube, tensioner support structure);

— wellhead or subsea structure at the lower end of the riser;

— valves (other than the mechanical design if they are in the dynamic load path);

— risers connected to mobile offshore drilling units (MODUs) or fixed platforms.

NOTE However, the interface of the riser with these components is important to the IM of the riser system.