Contents

Subsea Equipment Pressure Ratings

1 Scope

The impact of operation in deep water on the pressure rating of equipment is a special concern. The objective of this document is to foster a better understanding of the effects of simultaneous internal and external pressures on the rated working pressure of equipment covered by the scope of API 17D, *Design and Operation of Subsea* Production Systems—Subsea *Wellhead and Tree Equipment*. Additionally, it seeks to provide a high-level overview of issues that should be considered if a user elects to consider differential pressure in their design, especially in components with irregular geometry and/or high stress concentrations. It is not intended to serve as a design specification. This document was prepared in response to a request from the API SC17 committee.

2 Normative References

The following referenced documents are indispensable when considering the examples outlined in this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 17G, *Recommended Practice for Completion/Workover Risers,* Second Edition (July 2006)

API Recommended Practice 1111, *Design, Construction, and Maintenance of Offshore Hydrocarbon Pipelines (Limit State Design)*, Third Edition (July 1999)

API Report, *Example Model Analysis in Accordance with API* Recommended Practice *6HP Methodology*, by Stress Engineering Services, August 2008

API Specification 17D, *Design and Operation of Subsea Production Systems—Subsea Wellhead and Tree Equipment*, Second Edition (May 2011).

ASME *Boiler and Pressure Vessel Code, Section VIII, Division 2* [1]*, "Rules for Construction of Pressure Vessels, Alternative Rules*, 2010 Edition

ASME *Boiler and Pressure Vessel Code, Section VIII, Division 3, Rules for Construction of Pressure Vessels, Alternative Rules for Construction of High Pressure Vessels*, 2010 Edition

3 Definitions and Nomenclature

3.1 Definitions

For the purposes of this document, the following definitions apply.

3.1.1
design pressure
The maximum differential between internal pressure and external pressure during operating conditions at each cross-section. [Source: API 1111.]

3.1.2
rated working pressure
The maximum internal pressure a piece of equipment is designed to contain and/or control. [Source: API 17D, API 6A.]

[1]ASME International, 3 Park Avenue, New York, New York 10016-5990, www.asme.org.