Annular Casing Pressure Management for Offshore Wells

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Introduction

This document is intended to serve as a guide for managing annular casing pressure in offshore wells (formerly designated as API RP 90) and is now designated as API 90-1. A similar document has been prepared for annular casing pressure management for onshore wells, API 90-2. However, events involving annular casing pressure (ACP) incidents and risks prompted a revision of this document; a re-issue of the document was not considered prudent without revisiting the issues and risks involved in offshore ACP management.

Prevention of unintended ACP through proper well design and construction is important. However, this issue is beyond the scope of this document. Prevention of annular casing pressure is addressed in several other standards.

Similarly, remediation of ACP is beyond the scope of this document. Remediation is well-centric; it depends upon the specific conditions that exist in the individual well, the condition of that well, the level of ACP and the stresses that have been and are being imposed upon it. Thus, listing and describing all the potential remedies for eliminating or even reducing ACP would be far too massive for a generalized document.

This document covers monitoring, diagnostic testing, and the establishment of a maximum allowable wellhead operating pressure (MAWOP) that adequately describe those conditions where annular casing pressure is monitored and managed. Documentation requirements are outlined for the monitoring of annular casing pressure for various well types that exist offshore. Included is a discussion of risk assessment methodologies that can be used for the evaluation of well situations where the annular casing pressure is not within the MAWOP guidelines.

This document recognizes that ACP can result in various levels of risk to personnel, property, and the environment. The risks depend upon many factors including design of the well and the source of the ACP. This document provides guidelines that cover a broad range of casing annuli pressures that can be managed in a logical fashion while maintaining an acceptable level of risk. Annular casing pressures that do not conform to the conditions anticipated in this document may still be managed using similar logical methods to reduce risks to an acceptable level, but these risks should be evaluated on a case-by-case basis.

There are no known specific guidelines for managing risks associated with ACP that apply uniformly across the board. Further, each offshore operator is expected to have its own risk management system to deal with wells under their control. Attempts to standardize risk analysis and mitigation measures would result in an infinite number of solutions depending upon the conditions encountered. Therefore, this document attempts to provide general guidelines for operating wells with ACP.

Annular Casing Pressure Management for Offshore Wells

1 Scope

This document provides guidance for managing annular casing pressure in offshore wells of various types to ensure that well integrity is maintained, and risks are managed. It is similar in scope and purpose to API 90-2, which addresses this annular casing pressure management for onshore wells.

This document is meant to be used for existing offshore wells that exhibit annular casing pressure, including thermally induced casing pressure, sustained casing pressure (SCP) and operator-imposed pressure. It contains general information regarding annular casing pressure that is applicable to all offshore well types: fixed platform wells, subsea wells, hybrid wells and mudline suspension wells. Many risks are the same between well types, so much of the information has been collected into single sections that apply to all of them. Where necessary, information about individual well types is separated for clarity.

2 Normative References

There are no normative references in this document.

3 Terms and Definitions

For the purposes of this document the following terms, definitions and abbreviations apply.

3.1
ambient pressure
Pressure external to the wellhead.

NOTE In the case of a surface wellhead, ambient pressure is defined as zero psig (kPa). In the case of a subsea wellhead, it is equal to the hydrostatic pressure of a column of seawater at the depth of the subsea wellhead.

3.2
annular casing pressure
ACP
Pressure measured at the wellhead in the space between the tubing and casing or in the space between other casing strings that terminate in the wellhead.

3.3
annular casing pressure anomaly
A condition that differs from what is typical or expected, or which differs from that predicted by a theoretical model.

3.4
annulus
The space between the borehole and tubulars or between tubulars, where fluid (liquid, gas, or both) can flow.

NOTE The designation for the inner-most annulus, often the space between tubing and production casing, is the “A” annulus. Outer casing string annuli are designated “B,” “C,” “D,” etc. as pipe size increases in diameter.

3.5
barrier element
A pressure and flow containing component that relies on other component(s) to create a well barrier envelope and is verified to conform to specific acceptance criteria.