

Title	Report 377: Guideline for managing marine risks associated with FPSOs
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Abstract	<p>Scope</p> <p>Floating structures for production, storage and offtake have been used safely and reliably throughout the oil industry for many years, Early installations were primarily floating storage and offtake vessels, "FSO", but today the modern floating production, storage and offtake vessel, "F(P)SO" includes processing equipment and a higher level of sophistication. Consequently, the F(P)SO becomes an offshore producing installation, storage facility and loading terminal all rolled into one unit.</p> <p>The F(P)SO and the FSO present many of the same hazards to personnel and the environment, although the inclusion of production facilities on the F(P)SO increases the risk associated with any marine incident. This guide considers both types of installation using the term F(P)SO and only distinguishes between the two when the difference from a marine perspective is significant.</p> <p>There are many different types of F(P)SO, including, for example, weather-vaning designs with internal or external turrets, or spread moored designs that maintain a fixed position and orientation. Early F(P)SOs in the 1980s, taking advantage of a severe downturn in the tanker market, were converted from relatively new tankers. More recently, the tendency has been to use new, purpose-built, generally ship-shaped hulls, particularly for F(P)SOs associated with long field-life projects. However, conversions of tankers - both old and new - continue to take place.</p> <p>The F(P)SO allows oil companies to produce oil in more remote areas and in deeper water than would have been economically possible with other technology. The F(P)SO allows storage of crude oil and loading of tankers in the field rather than requiring a pipeline to transport oil to an onshore terminal facility. The provision of storage and loading has introduced additional hazards, however, which require the wisdom and experience of both oil field and marine experts to manage the associated risks.</p> <p>Approach</p> <p>These guidelines are intended to introduce project personnel, operators, and managers to the marine hazards associated with all types of F(P)SOs irrespective of configuration and geographic location. Such hazards include:</p> <ul style="list-style-type: none"> • Long-term exposure to environmental conditions without access to economical repair facilities • Additional motions and stresses induced by a floating ship-type structure • Potential collision with offtake tankers and field support vessels • Potential pollution associated with frequent transfers of crude oil <p>Notwithstanding these hazards, F(P)SOs have proven to be very safe, low-risk operations. These guidelines describe the considerations necessary to maintain marine risks at very low levels.</p> <p>The guidance contained has been collated from operating and design experience contributed from committees and individual experts and also much information contained in reports in the public domain and published national, international and industry standards. These have been referenced in the text where appropriate and for illustration a single standard may have been cited, the reader should be aware that other references (so, are contained in the bibliography of this document) may</p>

be used and will contain similarly useful information.

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