Remotely Operated Tools and Interfaces on Subsea Production Systems

API RECOMMENDED PRACTICE 17H
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Introduction

This recommended practice (RP) provides general recommendations and overall guidance for the design and operation of remotely operated tools comprising remotely operated tool (ROT), remotely operated vehicle (ROV), and autonomous underwater vehicle (AUV) tooling, used on subsea production systems for the petroleum and natural gas industries worldwide.

The fourth edition of this document incorporates a design for docking of AUVs.

This RP provides guidance when designing for subsea operations to interact with (or near) subsea production systems. The framework and specifications set out will enable the user to design the appropriate interface for a specific application.

Specific recommendations are provided where a standard design or operating principle has been adopted and is accepted as standard industry practice. Requirements valid for certain geographic areas or environmental conditions are included where applicable.

The functional recommendations for the tooling systems and interfaces on the subsea production system allow alternative solutions to suit the field-specific requirements. The intention is to facilitate and complement the decision process rather than replace individual engineering judgment and to provide positive guidance for the selection of an optimum solution.

Remotely Operated Tools and Interfaces on Subsea Production Systems

1 Scope

API Recommended Practice 17H provides recommendations for developing and designing remotely operated subsea tools and interfaces on subsea production systems to maximize the potential of standardizing equipment and design principles.

This document does not cover internal wellbore intervention, internal flowline inspection, tree installation, or tree running equipment. However, all the related subsea vehicles interfaces are covered by this standard. The RP applies to the selection, design, and operation of ROT, ROV, untethered underwater vehicle (UUV), underwater intervention drone (UID), autonomous inspection vehicle (AIV), and autonomous underwater vehicle (AUV), including subsea vehicle tooling, hereafter defined as “subsea intervention systems.”

This recommended practice provides:

a) functional requirements and guidelines for subsea vehicle interfaces;

b) guidance for the selection and use of subsea vehicle interfaces related to subsea production equipment;

c) guidance on design and operational requirements;

d) guidance for maximizing the potential of standardized equipment and design principles.

The issues this RP identifies should be considered when designing for ROV/ROT/UUV/AUV operations to interact with (or near) subsea production systems. The framework and specifications set out will enable the user to design the appropriate interface for a specific application. These interfaces include subsea docking, recharging, data transfer, data harvesting, and mechanical intervention.

Resident ROVs/AUVs near the seabed can provide high value for oil and gas inspection, monitoring, and maintenance and repair activities. The benefits of employing resident ROVs/AUVs include reduced operating costs and improved safety.

The guidelines established in this RP will lead to efficient development and deployment of subsea vehicle systems, providing clarity for operators, contractors, and developers. Recommendations have been provided in a flexible manner to accommodate a wide variation of ROV/AUV styles and applications while maintaining an appropriate level of interface commonality for specification.

This document defines four major categories of hot stabs, and it describes the geometry to maintain compatibility across all manufacturers. The categories were first introduced in API Technical Report 17TR15, which described several common or previously used hydraulic hot stab and receptacle configurations. The approach is to ensure backward compatibility of the hot stabs described in API 17H and to align API 17H with API S53 and API 16D.

This RP is not intended to replace sound engineering judgment as to when and where its provisions are to be used. Users need to be aware that additional or differing details may be required to meet a specific service or local legislation.

This document is not intended to deter the development of new technology. The intention is to facilitate and complement the decision-making process. The responsible engineer is encouraged to review standard interfaces and reuse intervention tooling to minimize life-cycle costs and increase the use of proven interfaces.