

# Remotely Operated Tools and Interfaces on Subsea Production Systems

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# Contents

	Page
1 Scope .....	1
2 Normative References .....	1
3 Terms, Definitions, Acronyms, and Abbreviations .....	2
3.1 Terms and Definitions .....	2
3.2 Acronyms and Abbreviations .....	5
4 Subsea Facilities Design .....	6
4.1 Intervention Philosophy .....	6
4.2 Intervention Strategies .....	7
4.3 Intervention System Design .....	8
4.4 Typical Components .....	9
4.5 Intervention Methods .....	9
4.6 Typical Subsea Vehicle Configurations .....	10
4.7 Intervention Vessels .....	12
4.8 Component and Module Intervention .....	12
4.9 Tie-in Systems .....	13
4.10 System Interfaces .....	13
5 Design Recommendations .....	14
5.1 General .....	14
5.2 Surface Equipment .....	17
5.3 Intervention Tools .....	21
5.4 Module/Component Replacement Tools .....	21
5.5 Subsea Intervention Tooling Control and Actuation .....	22
5.6 Indicator Systems .....	25
6 Subsea Intervention Interfaces .....	26
6.1 General .....	26
6.2 Subsea Vehicle Access .....	26
6.3 Vehicle Stabilization .....	29
6.4 Manipulator Interface Handle .....	35
6.5 Rotary Low-torque Interface .....	37
6.6 Low-torque Reaction Flange .....	39
6.7 Rotary High-torque Interface .....	40
6.8 Linear (Push) Interface, Type A and Type C .....	43
6.9 Linear (Push) Interface, Type B .....	45
6.10 Hot Stab Connections .....	47
6.11 Rotary Fluid Coupling .....	63
6.12 Component Change-out Interface .....	66
6.13 Lifting Mandrels .....	71
6.14 Electrical and Hydraulic Flying Lead Handling .....	73
6.15 Locking Ease .....	77
6.16 Docking Structure .....	80
6.17 Data Transfer .....	80
6.18 Data Harvesting .....	81
6.19 Energy Recharging .....	81
7 AUV Navigational Requirements .....	82
7.1 General .....	82

## Contents

	Page
7.2 AUV Docking Station Standoff Distance.....	82
7.3 Subsea Docking Station Vertical Approach Lane.....	82
7.4 Subsea Docking Station Horizontal Approach Lane.....	82
7.5 Communication/Data Harvesting Interfaces.....	83
8 Materials.....	83
8.1 General Recommendations.....	83
8.2 Selection criteria.....	83
9 Quality Control.....	84
10 Subsea Marking.....	84
10.1 General.....	84
10.2 Color Design.....	84
10.3 Marking Guidelines.....	87
11 Validation and Verification.....	90
11.1 Design Verification.....	90
11.2 Design Validation.....	93
Annex A (informative) Access.....	96
Annex B (informative) Manipulator Operating Envelopes.....	97
Annex C (informative) Alternative Designs for End-effectors.....	98
Bibliography.....	101

## Figures

1 Typical Work Class ROV/AUV Operationally Configured.....	11
2 Typical Interfaces on a Subsea TDU.....	11
3 Typical ROT Configuration.....	12
4 Grab Bar for Stabilization.....	30
5 Docking Probe and Receptacle.....	31
6 Typical Tooling Envelope for Twin-docking TDU.....	32
7 Typical Tooling Envelope for Single-docking TDU.....	33
8 Docking Receptacle Loading.....	34
9 Handles for Use with Manipulators.....	36
10 Handles for Use with TDU.....	37
11 Low-torque Receptacle.....	38
12 Low-torque Interface Flange.....	39
13 Rotary Torque Receptacle.....	41
14 Linear Push Interface, Type A.....	44
15 Linear Push Interface, Type C.....	45
16 Linear Push Interface Type B.....	46
17 Typical Hot Stab with Locking Arrangement and Hydraulic Connection.....	49
18 Typical Type 1 Hot Stab.....	50
19 Single Bore Multiport Hot Stab Receptacle.....	51

## Contents

	Page
20	Type 1 Installation Envelope ..... 53
21	Typical Type 2 Hot Stab..... 54
22	Dual-bore, Dual-port Tapered Hot Stab Receptacle ..... 54
23	Type 2 Installation Envelope ..... 55
24	Typical Type 3 Hot Stab..... 55
25	Single-port, High-flow Hot Stab ..... 57
26	Type 3 Installation Envelope ..... 59
27	Typical Type 4 Hot Stab..... 60
28	Dual-entry, High-flow Hot Stab ..... 60
29	Type 4 Installation Envelope ..... 62
30	“J” Slot Lock ..... 63
31	“J” Slot Details ..... 64
32	Rotary Fluid Coupling ..... 65
33	Component Change-out (CCO) Interface..... 67
34	Component Change-out (CCO) Interface Structure ..... 68
35	Component Change-out (CCO) Lockdown Post Receptacle ..... 69
36	Component Change-out (CCO) Lockdown and Weight System ..... 69
37	Component Change-out (CCO) Interface Layout Options ..... 70
38	Lifting Mandrels ..... 71
39	Lifting Mandrel in Relation to Component Change-out Interface ..... 72
40	Manipulator Connection Operations ..... 73
41	Tool Deployment Unit (TDU) Connection Operations..... 74
42	Multiple-quick Connection (MQC) ..... 75
43	Typical Flying Lead in Disengaged/Engaged Positions ..... 76
44	Combined Gripper and Torque Tool Envelopes for Flying Lead Handling..... 77
45	Type 1 Docking Arrangement ..... 78
46	Type 2 Docking Arrangement ..... 78
47	Docking Base Dimensional Requirements (with Padmat Foundation) ..... 79
48	Docking Structure Example ..... 80
A.1	Clearances ..... 96
B.1	Typical Five-function Grabber Envelopes ..... 97
B.2	Typical Seven-function Manipulator Envelopes..... 97
C.1	Alternative Profiles for End-effectors ..... 99
C.2	Alternative Profiles for End-effectors ..... 100

## Tables

1	Space Requirements for Vertical Access ..... 28
2	Typical Docking Parameters..... 34
3	Rotary Actuator Intervention Fixture Classification..... 40
4	Dimensions for Receptacle Classes 1 to 7 (Dimensions in inches [millimeters]) ..... 42
5	Principle Dimensions for Type 1 Receptacle..... 52
6	Envelope Dimensions for Type 1 Receptacle..... 53
7	Principle Dimensions for Type 2 Receptacles ..... 55
8	Envelope Dimensions for Type 2 Receptacles..... 56
9	Principle Dimensions for Type 3 Receptacles ..... 58
10	Envelope Dimensions for Type 3 Receptacles..... 59
11	Principle Dimensions for Type 4 Receptacles ..... 61
12	Envelope Dimensions for Type 4 Receptacles..... 62

## Contents

	Page
13 “J” Slot Lock Interface Dimensions.....	64
14 Marking Colors, Part 1.....	85
15 Marking Colors, Part 2.....	86

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## Introduction

This Recommended Practice provides general recommendations and overall guidance for the design and operation of remotely operated tools comprising ROT, ROV and AUV tooling, used on subsea production systems for the petroleum and natural gas industries worldwide.

The third edition of this document incorporates the content of API 17TR15 and the Autonomous Underwater Vehicle (AUV) Interfaces in a Subsea Production Environment Recommended Practice produced by DeepStar® Phase X.

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.

Technical Report 17TR15 clarified and defined the most commonly used hot stab types, and we have documented some obsolete sizes. The goal of the technical report was to increase standardization, and to maintain backward compatibility and interchangeability with existing installations and with previous publications (API 17H, API 53, and API 16D).

Specific recommendations are provided where a standard design or operating principle has been adopted and are 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 development and design of 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 manned intervention, internal wellbore intervention, internal flowline inspection, tree running and tree running equipment. However, all the related subsea ROV/ROT/AUV interfaces are covered by this standard. It is applicable to the selection, design and operation of ROTs, ROVs and AUVs including ROV tooling, hereafter defined as “subsea intervention systems”.

This Recommended Practice (RP) provides functional requirements and guidelines for ROV/ROT/AUV interfaces in subsea production fields for the petroleum and natural gas industries. It is applicable to both the selection and use of ROV/ROT/AUV interfaces related to subsea production equipment and provides guidance on design as well as the operational requirements for maximizing the potential of standardized equipment and design principles. This RP identifies the issues to be considered when designing for ROV/ROT/AUV operations to interact with (or near) subsea production systems. The framework and specifications set out enables the user (whether they may be on the ROV/ROT/AUV side or production facility side) to design the appropriate interface for a specific application. These interfaces include subsea docking, recharging, data transfer, data harvesting, and mechanical intervention.

It is anticipated that in the future, 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 ROVs/AUVs in such situations include reduced operating costs and improved safety. The guidelines established in this RP leads to efficient development and deployment of ROV/ROT/AUV systems, providing clarity for operators, contractors, and developers. Recommendations have been provided in a flexible manner to accommodate a wide variation of AUV styles and applications, while maintaining an appropriate level of interface commonality for specification.

This document defines four major categories of hot stabs and describes the geometry to maintain compatibility across all manufacturers. The categories were first introduced in 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 Recommended Practice 17H, 2<sup>nd</sup> Edition and to align API RP 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 processes, and the responsible engineer is encouraged to review standard interfaces and re-use intervention tooling in the interests of minimizing life-cycle costs and increasing the use of proven interfaces.

## 2 Normative References

The following referenced documents are indispensable for the application of 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 Specification 6A, *Specification for Wellhead and Tree Equipment*

API Specification 16D, *Control Systems for Drilling Well Control Equipment and Control Systems for Diverter Equipment*