Design, Installation, Operaton, Test, and Redress of Subsurface Safety Valve Systems

API RECOMMENDED PRACTICE 14B
SIXTH EDITION, SEPTEMBER 2015

ERRATA 1, SEPTEMBER 2024

REAFFIRMED, AUGUST 2026



Special Notes

API publications necessarily address problems of a general nature. With respect to particular circumstances, local, state, and federal laws and regulations should be reviewed. The use of API publications is voluntary. In some cases, third parties or authorities having jurisdiction may choose to incorporate API standards by reference and may mandate compliance.

Neither API nor any of API's employees, subcontractors, consultants, committees, or other assignees make any warranty or representation, either express or implied, with respect to the accuracy, completeness, or usefulness of the information contained herein, or assume any liability or responsibility for any use, or the results of such use, of any information or process disclosed in this publication. Neither API nor any of API's employees, subcontractors, consultants, or other assignees represent that use of this publication would not infringe upon privately owned rights.

Users of this standard should not rely exclusively on the information contained in this document. Sound business, scientific, engineering, and safety judgment should be used in employing the information contained herein.

API is not undertaking to meet the duties of employers, manufacturers, or suppliers to warn and properly train and equip their employees, and others exposed, concerning health and safety risks and precautions, nor undertaking their obligations to comply with authorities having jurisdiction.

API publications may be used by anyone desiring to do so. Every effort has been made by the Institute to ensure the accuracy and reliability of the data contained in them; however, the Institute makes no representation, warranty, or guarantee in connection with this publication and hereby expressly disclaims any liability or responsibility for loss or damage resulting from its use or for the violation of any authorities having jurisdiction with which this publication may conflict.

API publications are published to facilitate the broad availability of proven, sound engineering and operating practices. These publications are not intended to obviate the need for applying sound engineering judgment regarding when and where these publications should be utilized. The formulation and publication of API publications is not intended in any way to inhibit anyone from using any other practices.

Any manufacturer marking equipment or materials in conformance with the marking requirements of an API standard is solely responsible for complying with all the applicable requirements of that standard. API does not represent, warrant, or guarantee that such products do in fact conform to the applicable API standard.

All rights reserved. No part of this work may be reproduced, translated, stored in a retrieval system, or transmitted by any means, electronic, mechanical, photocopying, recording, or otherwise, without prior written permission from the publisher. Contact the publisher, API Publishing Services, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001.

Copyright © 2015 American Petroleum Institute

Foreword

Nothing contained in any API publication is to be construed as granting any right, by implication or otherwise, for the manufacture, sale, or use of any method, apparatus, or product covered by letters patent. Neither should anything contained in the publication be construed as insuring anyone against liability for infringement of letters patent.

The verbal forms used to express the provisions in this document are as follows.

Shall: As used in a standard, “shall” denotes a minimum requirement in order to conform to the standard.

Should: As used in a standard, “should” denotes a recommendation or that which is advised but not required in order to conform to the standard.

May: As used in a standard, “may” denotes a course of action permissible within the limits of a standard.

Can: As used in a standard, “can” denotes a statement of possibility or capability.

This document was produced under API standardization procedures that ensure appropriate notification and participation in the developmental process and is designated as an API standard. Questions concerning the interpretation of the content of this publication or comments and questions concerning the procedures under which this publication was developed should be directed in writing to the Director of Standards, American Petroleum Institute, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001. Requests for permission to reproduce or translate all or any part of the material published herein should also be addressed to the director.

Generally, API standards are reviewed and revised, reaffirmed, or withdrawn at least every five years. A one-time extension of up to two years may be added to this review cycle. Status of the publication can be ascertained from the API Standards Department, telephone (202) 682-8000. A catalog of API publications and materials is published annually by API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001.

Suggested revisions are invited and should be submitted to the Standards Department, API, 200 Massachusetts Avenue, NW, Suite 1100, Washington, DC 20001, standards@api.org.

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 Design 6
4.1 SSSV System Equipment 6
4.2 Control System 8
4.3 Wellhead/Tubing Hanger Passages and Connectors 10
4.4 Control Line Protectors 10
4.5 SSSV 10
4.6 Flow Couplings 12
4.7 Lock Mandrels, Safety Valve Landing Nipples, and Sealing Devices 12
4.8 Secondary Tools 12
5 Installation 12
5.1 General 12
5.2 Control line 12
5.3 Lock Mandrels, Safety Valve Landing Nipples, and Sealing Devices 12
5.4 Secondary Tools 12
5.5 Equipment Verification 12
6 Operation and Test 13
6.1 General 13
6.2 Control System 13
6.3 SCSSV Testing 13
6.4 SSCSV and SSISV Testing 14
7 Redress 14
7.1 General 14
7.2 SSSVs 14
7.3 Lock Mandrels and Secondary Tools 15
7.4 Inspection and Evaluation 15
7.5 Reassembly 15
7.6 Retest 15
7.7 SSSV Redress Documentation 15
8 Support Requirements 16
8.1 General 16
8.2 Handling 16
8.3 System Quality 17
8.4 Documentation and Data Control 17
Annex A (normative) SSSV Testing 19
Annex B (normative) Failure Reporting 24
Annex C (informative) Installation 27
Annex D (informative) Operations 30
Annex E (informative) Sizing of Subsurface-controlled Safety Valves and Subsurface-injection Safety Valves 32
Bibliography 37

Figures

1 Example: Surface-controlled Subsurface Safety Valve System in a Dry Tree Well 7
2 Example: Insert-type SSSV Assembly 11

Introduction

This document has been developed by users/purchasers and suppliers/manufacturers of subsurface safety valve (SSSV) equipment intended for use in the petroleum and natural gas industry worldwide. This document is intended to give requirements and information to both parties on the design, operation, installation, and testing of subsurface safety valve system equipment and also the storage/transport, maintenance, and redress of the SSSV equipment.

Users of this document should be aware that further or differing requirements might be needed for individual installations, storage/transport and maintenance. This document is not intended to inhibit the user/purchaser from accepting alternative engineering solutions. This may be particularly applicable where there is innovative or developing well-completion technology.

Significant revisions to the document include the following.

— Many former recommendations (shoulds) have become requirements (shalls).

— Alternate technologies for SSSV operation have been included.

— Secondary tools used in the servicing of tubing-retrievable type SSSVs have been included.

— Subsurface injection safety valves (SSISV) have been included.

— Information on insert-type valves for tubing-retrievable type SSSVs has been expanded.

— The annex describing testing of SSSVs has been changed from informative to normative. Examples have been added to illustrate various methods of calculating leakage rate for both liquid and gas leakage.

— The testing interval of surface controlled SSSVs (SCSSVs) has been limited to a maximum frequency of 12 months.

Design, Installation, Operation, Test, and Redress of Subsurface Safety Valve Systems

1 Scope

This document establishes requirements and provides guidelines for subsurface safety valve (SSSV) system equipment. This includes requirements for SSSV system design, installation, operation, testing, redress, support activities, documentation, and failure reporting. SSSV system equipment addressed by this document includes control systems, control lines, SSSVs, and secondary tools as defined herein. SSSV types including surface controlled (SCSSV), sub-surface controlled (SSCSV), and sub-surface injection safety valves (SSISV) are included. Requirements for testing of SSSVs including frequency and acceptance criteria are included. Alternate technology SSSV equipment and systems are included in these requirements.

This document is not applicable to design, qualification, or repair activities for SSSVs. This document does not specify when a SSSV is required.

NOTE API 14A provides requirements for SSSV equipment design, qualification, and repair.

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 14A, *Specification for Subsurface Safety Valve Equipment*

API Recommended Practice 14C, *Recommended Practice for Analysis, Design, Installation, and Testing of Basic Surface Safety Systems for Offshore Production Platforms*

API Recommended Practice 14E, *Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems*

API Recommended Practice 14F, *Design, Installation, and Maintenance of Electrical Systems for Fixed and Floating Offshore Petroleum Facilities for Unclassified and Class I, Division 1, and Division 2 Locations*

API Specification 14L, *Specification for Lock Mandrels and Landing Nipples*

ISO 9000:2005 [1], *Quality management systems—Fundamentals and vocabulary*

ISO 9712:2012, *Non-destructive testing—Qualification and certification of NDT personnel*

ASNT SNT-TC-1A [2], *Personnel Qualification and Certification in Nondestructive Testing*

---

[1] International Organization for Standardization, 1, ch. de la Voie-Creuse, Case postale 56, CH-1211, Geneva 20, Switzerland, www.iso.org.

[2] American Society for Nondestructive Testing, 1711 Arlingate Lane, P.O. Box 28518, Columbus, Ohio 43228, www.asnt.org.