Recommended Practice for the Care and Handling of Sucker Rods

API RECOMMENDED PRACTICE 11BR
NINTH EDITION, AUGUST 2008

REAFFIRMED, JULY 2020

Recommended Practice for the Care and Handling of Sucker Rods

Upstream Segment

API RECOMMENDED PRACTICE 11BR
NINTH EDITION, AUGUST 2008

REAFFIRMED, JULY 2020

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.

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.

Classified areas may vary depending on the location, conditions, equipment, and substances involved in any given situation. Users of this recommended practice should consult with the appropriate authorities having jurisdiction.

Users of this recommended practice 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 publications may be used by anyone desiring to do so. Every effort has been made by the Institute to assure 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, 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 © 2008 American Petroleum Institute

Foreword

This recommended practice is under the jurisdiction of the API Executive Committee on Standardization.

Detailed requirements applying to sucker rods are given in API Specification 11B, *Specification for Sucker Rods*, which also is under the jurisdiction of the API Executive Committee on Standardization.

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.

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

Tables

Recommended Practice for Care and Handling of Sucker Rods

1 Scope

This recommended practice (RP) covers the care and handling of steel sucker rods, including guidelines on selection, allowable stress, proper joint makeup, corrosion control and used rod inspection.

2 References

This specification includes by reference, either in total or in part, the most recent editions of the following API, industry, and government standards, unless a specific edition is listed:

API Specification 11B, *Specification for Sucker Rods*

API Technical Report 11L, *Design Calculations for Sucker Rod Pumping Systems (Conventional Units)*

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

NACE MR0174 [2], *Selecting Inhibitors for Use as Sucker-Rod Thread Lubricants*

NACE SP0195, *Corrosion Control of Sucker Rods by Chemical Treatment*

3 Selection of API Steel Sucker Rods

3.1 General

The selection of API grade sucker rods for a beam pump installation depends on a variety of factors, including stress effects, environmental effects and rod grade.

3.2 Stress Effects

Sucker rods need to be selected based on applied stresses. API 11L, *Design Calculations for Sucker Rod Pumping Systems* provides a procedure for calculating the applied loads or stress on a sucker rod string design.

Sucker rod strength is limited by the fatigue performance of the rod's metal. This useful strength is dependent on the metal's tensile strength as shown by Goodman (Goodman, "Mechanics Applied to Engineering" and Kommers, "Effect of Range of Stress and Kind of Stress on Fatigue Life"). This relationship is the basis for Section 4 of this document. According to the Goodman diagram shown in Figure 1, sucker rods operating in a non-corrosive environment and in the proper stress range will theoretically exceed 10 million load reversals. However, the fatigue life can be dramatically decreased by improper installation, design, handling or operation even without corrosion.

3.3 Environmental Effects

Sucker rods will eventually fail, even if not stressed, when placed in a corrosive environment. There is a reduction in sucker rod and coupling life if placed in a corrosive environment. However, the life of the sucker rod can be extended by the use of an effective corrosion inhibition program. In that case the expected life of a sucker rod can potentially be the same as a rod in a non-corrosive environment.

---

1 American National Standards Institute, 25 West 43rd Street, 4th floor, New York, New York 10036, www.ansi.org.

2 NACE International (formerly the National Association of Corrosion Engineers), 1440 South Creek Drive, Houston, Texas 77218-8340, www.nace.org.