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ERRATA

On page 4, a paragraph was omitted; it should be inserted as follows:

*Change the designation of the current paragraph 2.6.2.2, **Acceptance Criteria**, to **2.6.2.3 Acceptance Criteria**; add the new Paragraph 2.6.2.2, **Method of Testing**. Paragraph 2.6.2.2, **Method of Testing**, should read as follows:*

2.6.2.2 Method of Testing

The tensile-strength specimens shall be broken under tensile load, using equipment capable of measuring the load at which failure occurs. The tensile strength shall be computed by dividing the maximum load at failure by the smallest cross-sectional area of the specimen, as measured before the load is applied.

Pipeline Maintenance Welding Practices

API RECOMMENDED PRACTICE 1107
THIRD EDITION, APRIL 1991

American Petroleum Institute
1220 L Street, Northwest
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Pipeline Maintenance Welding Practices

Transportation Department

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FOREWORD

This recommended practice was prepared by a committee which included representatives of the American Petroleum Institute, the American Gas Association, the Pipeline Contractors Association, the American Welding Society, the American Society for Nondestructive Testing, and the pipe manufacturers and individuals associated with related industries, and it presents methods for producing high-quality maintenance welds on piping systems. These methods require that the welds be performed by qualified welders who use approved welding procedures, materials, and equipment. This recommended practice also presents methods for inspecting these welds.

The use of this recommended practice is voluntary, and it is intended to apply to the maintenance gas welding and arc welding of piping used in the compression, pumping, and transmission of crude petroleum, petroleum products, and fuel gases. It is also intended to apply, where applicable, to the distribution systems of these products.

This recommended practice represents the combined efforts of many engineers who are responsible for the design, construction, and operation of oil and gas pipelines, and the committee appreciatively acknowledges their whole-hearted and valuable assistance.

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Suggested revisions are invited and should be submitted to the director of the Transportation Department, American Petroleum Institute, 1220 L Street, N.W., Washington, D.C. 20005.

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CONTENTS

	Page
SECTION 1 GENERAL	
1.1 Scope	1
1.2 Definition of Terms	1
1.2.1 General	1
1.2.2 Definitions	1
1.3 Equipment	1
1.4 Materials	1
1.4.1 Pipe, Fittings, and Repair Materials	1
1.4.2 Filler Metal	1
1.4.3 Shielding Gases	2
1.5 Referenced Publications	2
SECTION 2 QUALIFICATION OF WELDING PROCEDURES	
2.1 Procedure Qualification	2
2.2 Records	2
2.3 Procedure Specification	2
2.4 Essential Variables	3
2.5 Welding of Test Assembly	3
2.6 Procedure Qualification Tests	3
2.6.1 Preparation	3
2.6.2 Tensile Tests	4
2.6.3 Nick-Break Tests	5
2.6.4 Root- and Face-Bend Tests	5
2.6.5 Side-Bend Tests—Groove Welds	6
2.6.6 Macro-Section Tests—Fillet Welds	7
SECTION 3 WELDER QUALIFICATION	
3.1 Purpose	11
3.2 Welding of Test Assembly	11
3.3 Essential Variables for Welder Qualification	11
3.4 Visual Examination	12
3.5 Performance Qualification Tests—Destructive Testing	12
3.5.1 Sampling of Test Welds	12
3.5.2 Tensile-, Nick-Break-, and Bend-Test Procedures	12
3.5.3 Macro-Section-Test Procedures and Test Acceptance Criteria Fillet Welds	13
3.6 Retest	13
3.7 Records of Qualified Welders	13
SECTION 4—SUGGESTED MAINTENANCE WELDING PRACTICES	
4.1 General	13
4.2 Alignment	14
4.2.1 Offset	14
4.2.2 Root Opening (Complete Encirclement Fittings)	14
4.3 Bevels	14
4.4 Weather Conditions	14
4.5 Clearance	14
4.6 Cleaning	14
4.7 Welding Sequence	14

	Page
SECTION 5 INSPECTION AND TESTING OF MAINTENANCE WELDS	
5.1 Right of Inspection	17
5.2 Visual Inspection	17
5.3 Nondestructive Testing	17
5.4 Certification of Nondestructive Testing Personnel	17
5.4.1 Procedures for Certifying Nondestructive Testing Personnel	17
5.4.2 Record of Certified Nondestructive Testing Personnel	17
5.5 Right of Rejection	18
5.6 Qualification of Welding Inspectors	18
SECTION 6—STANDARDS OF ACCEPTABILITY: NONDESTRUCTIVE TESTING (INCLUDING VISUAL)	
6.1 Introduction	18
6.2 Limitations of Test Methods	18
6.3 Incomplete Fusion	18
6.4 Porosity	18
6.5 Cracks	18
6.6 Undercutting	21
SECTION 7—REPAIR OR REMOVAL OF DEFECTS	
7.1 Authorization for Repair by Welding	21
7.2 Removal and Preparation for Repair of Defects	21
7.3 Testing of Repairs	21
7.4 Procedure for Repair of Cracks	21
Figures	
1—Procedure Qualification Test Assembly	4
2—Location of Test Specimens—Maintenance Welding Procedure Qualification Test	5
3—Tensile-Test Specimen—Groove Welds	6
4—Nick-Break-Test Specimens—Groove Welds	7
5—Nick-Break-Test Specimens—Fillet Welds	8
6—Dimensioning of Discontinuities in Weld Specimens	8
7—Root-Bend- and Face-Bend-Test Specimens—Groove Welds	9
8—Jig for Guided Bend Test	9
9—Side-Bend-Test Specimen—Groove Welds	10
10—Macro-Test Specimen—Fillet Welds	10
11—Welder Qualification Test Assembly	11
12—Location of Test Specimens—Maintenance Welder Qualification Test	12
13—Reinforcing Pad	14
14—Reinforcing Saddle	15
15—Encirclement Sleeve	15
16—Encirclement Tee	16
17—Encirclement Sleeve and Saddle	16
18—Encirclement Saddle	17
19—Maximum Distribution of Gas Pockets: Wall Thicknesses Less Than or Equal to 1/8 Inch (12.7 Millimeters)	19
20—Maximum Distribution of Gas Pockets: Wall Thicknesses Greater Than 1/8 Inch (12.7 Millimeters)	20

	Page
Tables	
1—Filler Metal Groups	4
2—Type and Number of Test Specimens—Procedure Qualification Test	6
3—Type and Number of Test Specimens—Welder Qualification Test	13
4—Undercutting Limits	21

Pipeline Maintenance Welding Practices

SECTION 1—GENERAL

1.1 Scope

This recommended practice covers recommended maintenance welding practices that may be used when making repairs to or installing appurtenances on piping systems which are or have been in service in the compression, pumping, and transmission of crude petroleum, petroleum products, and fuel gases and, where applicable, when making repairs to distribution piping systems for these products. The welding may be done by shielded metal-arc welding, gas tungsten-arc welding, gas metal-arc welding, flux-cored arc welding, or oxyacetylene welding using a manual or semiautomatic welding technique or a combination of the techniques.

This recommended practice does not preclude using other methods besides welding to install appurtenances or make repairs.

Note: The scope of this document is limited to the necessary operations of welding and to the associated activities of welding necessary for preparing materials for welding and for inspecting completed welds.

1.2 Definition of Terms

1.2.1 GENERAL

Many of the welding terms used in this recommended practice are defined in AWS A3.0. Some additions to and modifications of these definitions are provided in 1.2.2.

1.2.2 DEFINITIONS

1.2.2.1 *Company* refers to the owner company or the engineering agency in charge. The company may act through an inspector or other authorized representatives.

1.2.2.2 The term *contractor* includes the prime contractor and any subcontractors engaged in work covered by this recommended practice.

1.2.2.3 *Weld* refers to the completed weld.

1.2.2.4 A *qualified welding procedure* is a tested and proved detailed method by which sound welds with suitable mechanical properties and appearance can be produced.

1.2.2.5 A *welder* is the person who makes the weld.

1.2.2.6 A *qualified welder* is a welder who has demonstrated his ability to produce welds that meet the requirements of Section 2 or 3.

1.2.2.7 The *root bead* is the first bead in a weld.

1.3 Equipment

The welding equipment, whether gas or arc, should be of a type and size suitable for the work and should be adequately maintained to ensure acceptable welds, continuity of operation, and safety of personnel. Arc-welding equipment must be operated within the amperage and voltage ranges given in the qualified welding procedure; gas-welding equipment must be operated according to the flame characteristics and within the tip sizes given in the qualified welding procedure. Any equipment which does not meet the requirements of the qualified welding procedure must be repaired or replaced.

1.4 Materials

1.4.1 PIPE, FITTINGS, AND REPAIR MATERIALS

This recommended practice applies to welding steel pipe, fittings, and repair materials which conform to the following specifications and standards:

- a. API Specification 5L.
- b. API Specification 5LS.
- c. API Specification 5LX.
- d. Applicable ASTM¹ standards.

This recommended practice also applies to materials with chemical and mechanical properties that comply with the specifications listed in Items a–c above, even if the materials were not manufactured in accordance with those specifications.

1.4.2 FILLER METAL

1.4.2.1 Type and Size

All filler metals must conform to one of the following specifications: AWS A5.1, AWS A5.2, AWS A5.5, AWS A5.18, AWS A5.20, or AWS A5.29. If the filler metals are not manufactured in accordance with one of these specifications, they are still acceptable as long as their chemical and mechanical properties comply with one of the specifications.

1.4.2.2 Storage and Handling of Filler Metals

Filler metals shall be stored and handled carefully to prevent damage to them and to the containers in which they are shipped. Filler metals in open containers shall be protected

¹American Society for Testing and Materials, 1916 Race Street, Philadelphia, PA 19103-1187.