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TITLE: QUALIFICATION OF WELDERS AND WELDING PROCEDURES

VOLUME: 2 (Section 13.0), 10, and Yellow Book

COURSE ID: NONE

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★ TARGET AUDIENCE: Gas Welders

REVISIONS: (See ★)

- 1) Added Effective Date
- 2) Cover Page - Added Target Audience
- 3) Section 3 - Added CI-870-1 to Reference Section.
- 3) Section 4.3 (C) - Added section showing qualifying codes.
- 4) Section 9.1 - Added time requirement after failed a Spot Check.
- 5) Section 10.0 - New section, "Records".



Gas Operations Standards

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EH&S REVIEW BY: Craig Little				
AUTHOR:	APPROVED BY:	DATE APPROVED:	VOLUME: 2 (Section 13.0), 10, & Yellow Book	PAGE 1 OF
C. McCollum	Anthony Leto Chief Engineer Gas Transmission Engineering	06/05/18	Construction Standards and O&M Manual	10 PAGES



TITLE: QUALIFICATION OF WELDERS AND WELDING PROCEDURES

1.0 SCOPE

- 1.1 This specification outlines the requirements for qualifying welders and welding procedures.
- 1.2 All welders must qualify in accordance with this specification before welding on Company-owned piping outside the property line, and for gas piping on Company and private property up to the outlet of the meter.

2.0 LEGAL REQUIREMENTS

FEDERAL: DOT 192.3, 192.225, 192.227 and 192.229

STATE: 16NYCRR 255.225, 255.227, 255.229 and 255.230

3.0 REFERENCE

API 1104	-	American Petroleum Institute Standard for Welding Pipeline and Related Facilities, API Standard 1104, Twentieth Edition, including Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, Annex, Errata/Addendum [2007] and Errata 2 [2008], Reaffirmed April 2010.
G-1064	-	Shielded Metal Arc Welding Procedure
G-1066	-	Qualification of Nondestructive Testing Personnel & Procedure
G-1065	-	Qualification of Welders and Welding Procedures
G-1070	-	Radiographic Inspection of Pipeline Welds
G-8212	-	Operator Qualification (OQ) Compliance Program
CI-870-1	-	Records Management
Welder Qualification Process Flow Chart		
PQR1	-	Weld Procedure Qualification for G-1064 - Grade B to X60 Pipe
PQR2	-	Weld Procedure Qualification for G-1064 - X60 to X70 Pipe
PQR3	-	Weld Procedure Qualification for G-1064 - Wrought Iron Grade B - Fillet Welding
PQR4	-	Weld Procedure Qualification for G-1064 - Wrought Iron Grade B - Butt Welding



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4.0 **INITIAL QUALIFICATION OF WELDERS**

★ 4.1 General

- A) All welders shall be qualified for **MULTIPLE** qualification, as per Section 4.2.
- B) Arrangements for all tests shall be made through Gas Engineering.
- C) Each welder upon qualification shall be required to carry an ITS On Board eWallet card, which holds the welder's qualifications. If the welder does not have an ITS card, a card with their ITS ID number and a QR code of their qualifications is sufficient.
- D) All qualification welds shall be subject to visual inspection prior to destructive testing.
- E) The qualification of welders shall be conducted in the presence of an inspector or individual who is qualified at minimum as an ASNT VT Level II or AWS Certified Welding Inspector.
- F) All persons that perform destructive testing of qualification welds shall be qualified at minimum as an ASNT VT Level II or AWS Certified Welding Inspector, and all equipment used to perform qualification testing shall be operated and maintained per manufacturer's requirements.
- G) Paperwork for welder performance qualification shall at a minimum be signed by the contracted radiographic service.
- H) Each welder is required to pass the following exams for these covered tasks before they can weld on Con Edison Gas Piping:
 1. *CT06A or CT06B-Inspecting for Atmospheric Corrosion*
 2. *CT23 & 24 Inspecting the Condition of Exposed Pipe*
 3. *CT44 & 54-Welding on a Pipeline*
 4. *CT70-Properties of Natural Gas and Abnormal Operating Conditions*

4.2 Type of Qualifications

A) Multiple Qualification

For Multiple Qualification, the welder shall make a test assembly using the appropriate qualified welding procedures for the butt weld, **and** the fillet weld. ([G-1064](#))



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4.0 **INITIAL QUALIFICATION OF WELDERS** (Continued)

A welder who has successfully completed the multiple qualification test using pipe with an O.D. of 12.750" or more shall be qualified to weld in all positions, on all wall thicknesses, joint designs, and fittings, and on all pipe diameters.

Test Welds	Welder Qualified For
<p>Beveling and butt-welding 12 3/4" OD x 3/8" (0.375") wall thickness pipe sections in a fixed position at 45°. (A 16" or 20" butt weld x 3/8" wall thickness may be substituted for the above. Two welders required per G-1064).</p> <p>Laying-out, cutting, contouring, beveling and welding a 12 3/4" OD or larger header pipe with a full size branch, all pipe to be of a 3/8" wall thickness. A full size hole shall be cut in the pipe run. The weld shall be made with the run-pipe axis in the horizontal position and the branch-pipe axis extending downward from the run.</p>	<p>Welding on all diameters, fittings, positions, wall thicknesses, and joint designs (butt and fillet welds).</p>



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4.0 **QUALIFICATION OF WELDERS** (Continued)

B) Welders Qualified Other Than by Con Edison

A welder who is qualified by a company other than Con Edison, shall be **CONSIDERED** for acceptance for production welding on Company pipelines, only when all of the following conditions are met:

- 1) The welder has qualified under a specification that is equivalent to Con Edison's [G-1064](#) and [G-1065](#).
- 2) A copy of the current test results from the independent testing agency is delivered to Gas Engineering.
- 3) The welder has been issued a qualification card.

Gas Engineering shall determine the acceptability of all welding procedures and qualifying methods of other companies.

4.3 Welder Qualification Tests to Be Performed

A) Welds shall be subjected to the following prescribed tests, each as stipulated in API 1104:

- 1) Visual Examination
- 2) Radiographic Examination
- 3) Destructive Tests

B) Test results shall be recorded by the inspection agency on forms similar to those indicated in API 1104.

★ C) Each welder must be qualified in accordance with section 6, section 12, Appendix A or Appendix B of the listed API Std 1104 or section IX of the ASME Boiler and Pressure Vessel Code.



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5.0 RETESTS

- 5.1 If a welder fails the qualification test, Gas Engineering may require further training prior to any retests.
- 5.2 If a welder fails the test for one group, the welder shall not be tested for another group until the welder has passed the group the welder failed.

6.0 TENURE OF QUALIFICATION

- 6.1 A welder qualified under this specification shall continue to be qualified providing:
 - A) Radiographic inspection has indicated consistently satisfactory welds, as per [G-1070](#).
 - B) The welder has complied with the six month periodic requalification test. See Section 6.2.
 - C) No change in essential variables used to qualify the original welding procedure.
- 6.2 The six-month periodic requalification test shall consist of butt welding pipe samples and verification of quality by visual inspection and radiographic examination (RT). The size of the pipe to be used is listed in Table 1.

TABLE 1

<u>Present Qualification</u>	<u>Periodic Requalification Test</u>
Multiple Qualification	Butt-weld 4" and larger x 3/16" to 3/4" wall thickness

It shall be the responsibility of the welder or welder's employer to update requalification testing.

The Field Representative shall forward to Gas Engineering the report certifying compliance with Section 6.1 (A) to 6.1 (C).



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6.0 TENURE OF QUALIFICATION (Continued)

6.3 The RT of a production butt weld performed within the two month period prior to expiration date of the welder's Identification Card may be substituted for the test as outlined in Paragraph 6.2. The size of the pipe used to requalify using a production weld is listed in Table 1.

6.4 It shall be the responsibility of the radiographic inspector to make the proper notations on the RT reports. The report shall contain:

- 1) Weld number (not applicable on welding qualification or requalification reports)
- 2) Weld procedure [G-1064](#) or Shielded Metal Arc Welding (SMAW)
- 3) Welder's name or Identification Number
- 4) Location and date
- 5) Size of pipe
- 6) Name and/or Signature of Radiographer/Interpreter

One copy of the RT report shall be given to the welder's employer and one copy to the Field Representative. The Field Representative shall forward a copy of the report to Gas Engineering.

6.5 Gas Engineering may require that a welder retake the qualification test where the welder's performance is in question.

7.0 RECORD OF QUALIFIED WELDERS

A record of the tests on the qualification and requalification weld shall be maintained by Gas Engineering.

8.0 QUALIFICATION OF WELDING PROCEDURES

8.1 General

The qualification of a welding procedure shall include data as stipulated in API 1104, and shall be recorded in a form similar to that indicated in Figure 1 & 2 of API 1104 Section 5.

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8.0 **QUALIFICATION OF WELDING PROCEDURES**(Continued)

8.2 **Qualification**

- A) The qualified welding procedures shall form the basis for the tables and requirements for welding variables in the Company welding specification [G-1064](#).
- B) Testing shall be performed only by company personnel or Gas Engineering approved third party weld testing companies with appropriate training, qualification and experience to assure the weld qualification procedure meets requirements of API 1104.
 - 1) All equipment used to perform destructive testing of qualification welds shall be operated, maintained, and calibrated in accordance with manufacturer’s requirements.
 - 2) Persons responsible for performing destructive testing of qualification welds shall be qualified to operate said equipment.
- C) Any change in a qualified procedure or the qualification of a new procedure requires the written approval of Gas Engineering, and must be performed in accordance with API 1104.
- D) The qualified procedure shall be filed with the New York State Public Service Commission. If a procedure is re-established as a new procedure, or otherwise changed, the NY PSC shall be updated.

8.3 **Records**

- A) The details of each acceptable qualified procedure shall be recorded by the qualified testing personnel and shall show the complete results of the procedure qualification tests, as stipulated in API 1104
- B) All records of qualified weld procedures shall be maintained by Gas Engineering.



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8.0 QUALIFICATION OF WELDING PROCEDURES(Continued)

8.4 Re-establishment of a Welding Procedure

A welding procedure must be re-established as a new procedure when any of the essential variables listed in API 1104 are changed.

9.0 QUALITY ASSURANCE FOR WELDERS

- ★ 9.1 One unannounced non-destructive test (Spot Check) must be made at least once each calendar year, on at least one of each welder's welds. A field weld is defined as any production weld. Non-destructive testing can include radiography, mag-particle or dye penetrant examinations performed by an independent testing agency. The installing organization shall maintain all inspection records in an electronic database where the inspection reports are scanned into. Engineering shall be notified of all completed spot checks.

If a welder on the list did not have a spot check performed, arrangements should be made to have a spot check completed. **It shall be the responsibility of each organization, who has qualified welders, to arrange for the spot checks of their welders.** For example, it shall be the responsibility of Steam Distribution to spot check their welders and contractor welders assigned to Steam Distribution.

Failure of a spot check requires unannounced testing of an additional weld. A second failure requires another unannounced test of an additional weld. A third failure requires the welder to take the initial qualification test again. All follow-up unannounced spot checks of a welder must be conducted within three months or as soon as possible.

Failure to have a spot check within the calendar year will require the welder to take the initial qualification test again.

A welder's certification card shall be inspected and compared to the "Qualified Welders" list for compliance by a Gas Engineering approved 3rd party weld testing agency and/or a Con Edison Field Representative.

- 9.2 When the welder's performance is in question, Gas Engineering may require that the welder have further training, or retake the qualification test.



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★ 10.0 **Records**

Any records generated in the course of performing work in accordance with this specification shall be maintained as required by Corporate Instruction [CI-870-1](#) "Records Management". Guidance on the retention of Company Gas Operations records can also be found on the [Records Management](#) intranet site.

11.0 **Appendices**

A. Welder Qualification Process Flow Chart



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Appendix A

WELDING QUALIFICATION PROCESS

