



11-20-08A11:34 RCVD

November 19, 2008

Via Federal Express

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SENT TO COMPLIANCE REGISTRY
Hardcopy Electronically
of Copies 1 / Date 11.20.08

**RE: Notice of Amendment (NOA)
CPF 5-2008-5043M**

This letter is written in response to the above Notice of Amendment (NOA) letter dated October 15, 2008 and received by Kinder Morgan October 21, 2008. This NOA was written as a result of the inspection conducted by the Pipeline and Hazardous Materials Administration (PHMSA) between May 12-16, 2008. The NOA identified apparent inadequacies within Kinder Morgan's plans and procedures.

Although three individual Sections of 49 CFR Part 195 was found to be inadequate, the cause of the inadequacies was essentially the same - failure to explicitly list the appropriate referenced industry standard or applicable Section of the industry standard within the procedure. We have revised the applicable procedures and have attached them for your review.

The specific Citations are as follows:

1. **§195.214 Welding procedures.**
 - (a) **Welding must be performed by a qualified welder in accordance with welding procedures qualified under Section 5 of API 1104 or Section IX of the ASME Boiler and Pressure Vessel Code (ibr, see § 195.3). The quality of the test welds used to qualify the welding procedure shall be determined by destructive testing**

Kinder Morgan does not specify in its O&M manuals what Section and edition of API 1104 needs to be used to qualify its Welding Procedures. Kinder Morgan's O&M Procedural Manuals only refer to "applicable Section of API 1104" or reference the "CFR 49 Part 195 Referenced Edition". The welding procedures did

not explicitly reference the appropriate industry standard that will be used to qualify their welding procedures.

Please see attached, procedure LO&M 407, Section 3.1 and Section 6 for the explicit applicable reference

2. §195.222 Welders: Qualification of welders.

- (a) **Each welder must be qualified in accordance with Section 6 of API 1104 (ibr, see § 195.3 or Section IX of the ASME Boiler and Pressure Vessel Code, (ibr, see § 195.3) except that a welder qualified under an earlier edition than listed in § 195.3 may weld but may not re-qualify under that earlier edition.**

Kinder Morgan does not specify in its O&M manuals what Section and edition of API 1104 need to be used to qualify its welders. Kinder Morgan's Operations and Maintenance Manuals only require its welders to be qualified in conformance with 49 CFR Part 195, and the latest DOT-approved edition of API 1104. KM's O&M manual must explicitly reference the appropriate industry standard to be used to qualify its welders.

Please see attached, Procedure LO&M 401, Section 2.1 and Section 6 for the explicit applicable reference

3. §195.228 Welds and welding inspection: Standards of acceptability.

- (b) **The acceptability of a weld is determined according to the standards in Section 9 of API 1104. However, if a girth weld is unacceptable under those standards for a reason other than a crack, and if Appendix A to API 1104 (ibr, see § 195.3) applies to the weld, the acceptability of the weld may be determined under that appendix.**

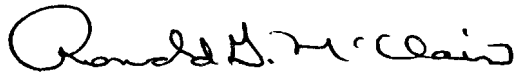
Kinder Morgan does not specify in its O&M manuals what Section and edition of API 1104 need to be used to inspect its welds. Kinder Morgan's Operations and Maintenance Manual states, "NDT testing shall conform, or exceed requirements of the 49 CFR Part 195 most recent edition and applicable Section of API 1104 most recent DOT approved edition". KM's O&M manual must explicitly reference the industry standard to be used to inspect and accept their welds.

Please see attached, Procedure LO&M 401, Section 3.4.1 and Section 6 for the explicit applicable reference

Chris Hoidal, P.E.
November 19, 2008
Page 3 of 3

Kinder Morgan is committed to operating our pipelines safely and in compliance with all applicable regulations. We trust that our response in the matter is satisfactory. If not please contact Edward A "Buzz" Fant at (713) 369-9454 or me at (713) 369-9152.

Sincerely,

A handwritten signature in black ink that reads "Ronald B. McClain". The signature is written in a cursive style with a large initial "R" and "M".

Ron McClain
Vice President, Operations and Engineering
Product Pipelines
Kinder Morgan Energy Partners, L.P.

Attachments

LIQUIDS O&M PROCEDURE

Table of Contents

Table of Contents.....	1
1. Applicability.....	1
2. Scope	1
3. Core Information and Requirements	1
3.1. Procedure Qualification	1
3.2. Multiple Procedures.....	2
4. Training.....	2
5. Documentation	2
6. References	2

1. Applicability

- Crude
- Refined Products /Natural Gasoline
- Highly Volatile Liquids (HVLs)
- CO2

2. Scope

L-O&M Procedure 407a, Welding Procedure Selection Guide lists qualified welding procedures for welding on the KM's liquids pipeline facilities (Procedure Qualification Records (PQR) are kept by Codes and Standards group in Lakewood). All work will be performed in conformance with 49 CFR Part 195, and the applicable sections of API Standard 1104 or ASME Section IX, whichever code is applicable to the work being performed.

3. Core Information and Requirements

Perform all welding in conformance with the qualified welding procedure established for pipe size, wall thickness and material as provided in **L-O&M Procedure 407a, Welding Procedure Selection Guide**. When welding materials of two separate material groups, use the procedure for the higher strength group. When qualifying a welding procedure the qualification shall be done on the highest strength material in the group, (refer to API 1104).

3.1. Procedure Qualification

Each pipeline welding procedure shall be qualified in accordance with either Section 5 of API 1104 or ASME Section IX. Qualifying test results for each welding procedure shall be recorded in detail on a Procedure Qualification Record (PQR). Only destructive testing performed in accordance with the applicable welding standard may be used to qualify the test welds for the proposed welding procedure. The Lakewood Codes and Standards Department will provide assistance with the qualification process. Welding procedures will be developed, qualified and published as necessary.

A non-standard welding procedure may be developed, qualified, recorded and used on specific projects when no standard welding procedure is available that meets the project needs or when, with the KM's approval, the contractor elects to furnish its own qualified welding procedures. The Lakewood Codes and Standards Department shall be consulted whenever a non-standard welding procedure is to be qualified and used on the KM's pressurized facilities.

The Project Manager shall be responsible for assuring the proper welding procedure qualification and for maintaining proper records of such at the construction site during

LIQUIDS O&M PROCEDURE

construction. The non-standard qualified procedure, along with the supporting procedure qualification records shall be included in the project as-built documents and a copy sent to the Lakewood Codes and Standards Department.

3.2. Multiple Procedures

Many of the welding procedures will include a choice of welding options to join a specific range of O.D., wall thickness and pipe grade using different electrode types and welding parameters. The options are indicated within the procedure by subsections A, B, C, etc. The project manager must direct the welder(s) to follow the specific procedure and subsection (if applicable) prior to the start of work. The inspector must indicate on any written document the specific procedure and subsection (if applicable) used during the welder testing and project. The inspector will verify that the welder(s) is/are following the appropriate welding procedures. Any desired change of an essential variable as detailed in the governing welding code will require a new procedure qualification.

4. Training

Review this procedure and the applicable welding procedures, as necessary, before performing the work.

Persons performing maintenance welding tasks must be qualified in accordance with the KM Operator Qualification (OQ) Program (refer to **L-O&M Procedure 199, Operator Qualification**).

5. Documentation

The Lakewood Codes and Standards Department will maintain welding procedure qualification records for welding procedures.

6. References

- 49 CFR 195 – Transportation of Hazardous Liquids by Pipeline
- API 1104 Welding of Pipelines and Related Facilities, (19th edition, 1999 including October 31, 2001 errata)(49 CFR 195 referenced edition)
- ASME Code – Section IX - Welding and Brazing Qualifications (2004 edition, including addenda through July 1, 2005)(CFR 49 Part 195 referenced edition)
- **L-O&M Procedure 407a – Welding Procedure Selection Guide**
- **L-O&M Procedure 199, Operator Qualification**

Table of Contents

Table of Contents	1
1. Applicability.....	1
2. Scope	1
2.1. In the United States:.....	1
2.2. In Canada:	1
3. Core Information and Requirements	2
3.1. Qualification Requirements.....	2
3.2. KM Welder Tests	2
3.3. Contract Welder Tests	4
3.4. Maintain Qualification	4
3.5. Welding Changes Requiring Qualification	5
3.6. Welder Testing Procedure	5
3.7. Destructively Testing a Weld	6
3.8. Failed Test	6
3.9. Retesting due to conditions beyond the welder's control:	6
4. Training.....	7
5. Documentation	7
5.1. In United States:	7
5.2. In Canada:	7
6. References	7
Table 1: Weld Specimen Requirements – API 1104 and Low Hydrogen	9
Attachment 1 - Specimens - Maintenance Welder Qualification Test	10
Attachment 2 - Testing Procedure Chart	11
Attachment 3 - Testing Procedure Chart	11

1. Applicability

- Crude
- Refined Products/Natural Gasoline
- Highly Volatile Liquids (HVLs)/ High Vapour Pressure (HVPs)
- CO2

2. Scope

This procedure describes qualifying and testing procedures/requirements for Company and contractor welders within the United States and Canada. U.S. DOT Pipeline safety and Canadian NEB regulations require that only a qualified welder may weld on Kinder Morgan (KM) DOT or NEB jurisdictional pipelines or facilities, using qualified welding procedures.

2.1. In the United States:

A welder must be qualified in conformance with 49 CFR Part 195, Section 6 of API Standard 1104 or ASME Boiler and Pressure Vessel Code, Section IX, except that a welder qualified under an earlier edition than listed in **195.3** may weld, but may not re-qualify under that earlier edition.

2.2. In Canada:

A welder must be qualified in conformance with Z662-07, Clause 7.8 in order to be qualified to weld. In addition, if pump station piping is designed as specified in ASME B31.3 and

shall be welded in accordance with the welding requirements of ASME B31.3. For other than partial-penetration butt welds, welding procedures specifications that are established and qualified as specified in the ASME Boiler and Pressure Vessel Code, Section IX may be used, provided that the welder qualification tests are as specified in the ASME boiler and pressure Vessel Code, section IX.

3. Core Information and Requirements

KM or their representative will administer welder qualification tests. Testing locations and times will be pre-scheduled.

3.1. Qualification Requirements

A welder shall meet one of these eligibility requirements to be tested as a welder:

- The person has passed a similar test recently
- The person has successfully passed a welding training program with an accredited welding school or shows evidence of at least 12 months of welding experience
- The welder has not been disqualified on a KM project by test or performance within the previous 30 days

All welders must pass the applicable Welder Tests listed below to be qualified, as determined by Operations or project requirements.

3.2. KM Welder Tests

3.2.1. In United States

KM Welders shall pass annual visual (L-O&M Procedure 406, Weld Inspection and Testing) and destructive tests to be qualified for the appropriate welding procedure. A KM welder will complete the annual test and any subsequent retests no later than April 1. A KM welder must pass Test 1 and 2. In addition, KM may require a welder to pass Test 3, or four as applicable:

Test 1 - API 1104 Test – Multiple Qualification Test – Cellulosic Electrodes

- The welder must complete a girth weld test on pipe nipples with an outside diameter equal to or greater than 12 3/4 inch (323.9 mm) OD and with a wall thickness of at least 0.250 inch (6.4 mm) (without backing strip), welded in either the horizontal plane or inclined from the horizontal plane at an angle of not more than 45 degrees. Welding will be done with a qualified cellulosic welding electrode procedure (see L-O&M Procedure 407, Welding Procedures) and tested according to Table 1 and specimens removed at locations as shown in Attachment 1A.
- .
- The welder must complete a branch weld test on pipe nipples with an outside diameter equal to or greater than 12 3/4 inch (323.9 mm) OD and with a wall thickness of at least 0.250 inch (6.4 mm) w.t. minimum, welded with the run pipe in the horizontal position and the branch pipe axis extending vertically down. The welder shall lay out, cut, fit and weld a full sized branch-on-pipe connection. A full sized hole shall be cut in the run pipe. Welding will be done with a qualified cellulosic welding electrode procedure (see L-O&M Procedure 407, Welding Procedures) and tested according to Table 1 and specimens removed at locations as shown in Attachment 1B.

Test 2 –Sleeve Test – Low Hydrogen

- Prior to starting this test, the main carrier pipe will be set up to hold standing water. This may be accomplished by welding a weld cap to one of the ends of the pipe. The level of the water should be such that the top end of the sleeve is below the water level within the carrier pipe. The test position of the pipe will be in the 45° angle ($\pm 5^\circ$) position.
- The welder must complete longitudinal butt and fillet welds on a split sleeve (0.250(6.4mm) inch or thicker) installed on 12-3/4 (323.9 mm) inch OD pipe using a qualified low hydrogen (E7018) welding rod procedure for the fillet weld and a qualified low hydrogen or cellulosic welding rod procedure for the longitudinal butt weld.. The sample will be tested according to **Table 1** using specimens removed at locations as shown in **Attachment 1B & 1C**.
- After the welder has passed the initial sleeve test above and maintained his or her qualification, KM may allow this welder to utilize the following test to qualify in lieu of a sleeve test; a girth weld on 2-3/8 inch (60.3 mm) OD, 0.218 inch (5.5 mm) w.t. and 6-5/8 inch (168.3 mm) OD, 0.432 inch (11.0 mm) w.t., Grade B or better pipe welded in the fixed 6G position using qualified welding procedures. The welder can use a backing strip or weld the root pass with E6010 welding rod, which will be ground out substantially so that it serves only as a backing strip. The remaining weld will be completed with E7018 welding rod in conformance with the qualified welding procedure. Both samples will be tested in conformance with ASME Section IX requirements.

Test 3 – API 1104 Test – Multiple Qualification Test – Low Hydrogen

- The welder must complete a girth weld test on pipe nipples with an outside diameter equal to or greater than 12 3/4 inch (323.9 mm) OD and with a wall thickness of at least 0.250 inch (6.4 mm) (without backing strip), welded in either the horizontal plane or inclined from the horizontal plane at an angle of not more than 45 degrees. Welding will be done with a qualified low hydrogen welding electrode procedure (see **L-O&M Procedure 407, Welding Procedures**) and tested according to **Table 1** and specimens removed at locations as shown in **Attachment 1A**.
- The welder must complete a branch weld test on pipe nipples with an outside diameter equal to or greater than 12 3/4 inch (323.9 mm)OD and with a wall thickness of at least 0.250 inch (6.4 mm) w.t. minimum, welded with the run pipe in the horizontal position and the branch pipe axis extending vertically down. The welder shall lay out, cut, fit and weld a full sized branch-on-pipe connection. A full sized hole shall be cut in the run pipe. Welding will be done with a qualified low hydrogen welding electrode procedure (see **L-O&M Procedure 407, Welding Procedures**) and tested according to **Table 1** and specimens removed at locations as shown in **Attachment 1B**.

Test 4 – ASME Section IX Test

The welder must complete the following using a qualified cellulosic electrode welding procedure:

- Girth weld test on 2-3/8 inch (60.3mm) OD, 0.218 inch (5.5 mm) w.t. Grade B or better pipe welded in the fixed 6G position
- Girth weld test on 6-5/8 inch (168.3 mm) OD, 0.432 inch (11.0 mm) w.t., Grade B or better pipe welded in the fixed 6G position

Both samples will be tested in conformance with ASME Section IX requirements and will qualify the welder to the essential variable limits specified in ASME Section IX.

KM welders will be allowed to test for qualification and re-qualification according to the procedures shown in **Attachment 2** and **Attachment 3**.

Special Welding Process Tests

KM may qualify a welder using an additional welding process if required for the operating area. The welder must follow Company-approved welding procedures when testing and welding.

3.2.2. In Canada

A KM welder must pass a welding test in accordance with Z662-07 Clause 7.8 by demonstrating their ability to produce acceptable welds in accordance with specified KM Canadian qualified welding procedure specifications for the particular position involved.

KM welders who will be conducting in-service welding must have their test welds visually inspected under Z662-07, Clause 7.8.4 and destructively tested under Z662-07, Clauses 7.7.2 to 7.7.6 or Clauses 7.7.7 to 7.7.9.

KM welders who will be conducting production welding will have their test weld visually inspected under Z662-07, Clause 7.8.4 and non-destructively tested under Z662-07, Clauses 7.10.4.

3.3. Contract Welder Tests

3.3.1. In United States:

A contract welder must pass one or more of the tests described in **L-O&M Procedure 456, Welding and Fabrication** for a multiple or single qualification. When required, a contract welder will take a low hydrogen welding test as described in KM **Welder Test 2** and/or **3** and/or an ASME welding test as described in Company **Welder Test 4** (see above).

For a fabrication shop or turnkey project, the Project Manager will determine the method of verifying welding procedure qualification and welder qualification to meet Part 195 and/or ASME requirements.

3.3.2. In Canada:

A contract welder must pass the test under Section 3.2.2 above to be able to weld butt, branch or fillet welds. However, KM may provide a limited butt welder qualification under Z662-07, Clause 7.8.3.

Z662-07, section 7.8.3 pertains to welders whose work is limited to specific weld passes in a multi pass butt weld. A welder shall qualify by demonstrating their ability to weld those specific passes in accordance with a qualified welding procedure specification, with the other weld passes necessary to make complete welds being made by others.

For a fabrication shop or turnkey project, the Project Manager will determine the method of verifying welding procedure qualification and welder qualification to meet CSA Z662-07 Clause 7.8 and/or ASME Boiler and Pressure Vessel Code, Section IX requirements.

3.4. Maintain Qualification

3.4.1. In United States:

A qualified welder can re-qualify using a particular welding process only if the welder can substantiate having engaged in welding with that process within the preceding 6 calendar months and has one weld tested and found acceptable under Section 9 of API 1104

The Project Manager or Operations Manager must have adequate documentation (the NDT technician's log) to verify the welder's initial test results and any subsequent test results prior to requalification testing. Obtain verification of the welder's qualification. The welder must make all weld passes for a requalification weld and demonstrate the ability to weld in all

positions, i.e., make at least one-half of a girth weld from the top to bottom when two welders are making the test weld.

Welders shall maintain the qualification after the annual qualification date by either:

- Passing a visual examination and submitting an acceptable x-ray of a 6-inch or larger butt weld. When the radiograph of a production weld is not available within the specified period, the welder may submit a radiograph of a test weld made on a 6-5/8 inch OD or larger pipe. The qualification is based on the radiographic contractor accepting the weld in conformance with the radiographic limits of acceptability in Section 9 of API 1104 or ASME Section V and B31.4 – Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids, depending on the qualification standard.
- Passing a visual examination and destructive test on a 6-inch OD or larger test girth weld that is acceptable in conformance with **Table 1** or ASME Section IX and B31.4 – Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids, depending on the qualification standard

To maintain qualification for each welding process previously passed (SMAW, GMAW, etc.), the welder must provide an acceptable x-ray or destructive test for each welding process. If a KM or contract welder fails to maintain qualification within the period permitted, the welder must qualify by performing all initial qualification tests. The Operations or Project Manager is responsible for tracking welders' qualification status.

A welder may be required to re-qualify if the KM Representative determines a need to verify welder competency.

KM has a right to revoke welder qualification based on poor performance.

3.4.2. In Canada:

In accordance with Z662-07, Clause 7.8.1.3, welders continuously employed by KM and regularly making welds shall be required to re-qualify under section 3.2.2 of this procedure at intervals of not greater than 2 years (24 months). Welders not so employed shall be required to re-qualify at intervals not greater than 1 year (12 months).

Notwithstanding the requirement for requalification at intervals of either 1 or 2 years, KM company or contract welders who have not made welds for a period in excess of 3 months since they last qualified should be at least check-tested. KM defines check-tested to mean, have a weld visually and non-destructively tested. A welder may be required to re-qualify if the KM Representative determines a need to verify welder competency. KM has a right to revoke welder qualification based on poor performance.

3.5. Welding Changes Requiring Qualification

3.5.1. In United States:

The qualified welder can weld only within the limit of the essential variables in conformance with the applicable welding code and 49 CFR Part 195.222. If any of the essential variables are changed, the welder desiring to use a new procedure shall be re-qualified.

3.5.2. In Canada

The qualified welder can weld only within the limit of the essential variables in conformance with Z662-07, Clause 7.6.5. If any of the essential variables are changed, the welder desiring to use a new procedure shall be re-qualified under section 3.2 or 3.3 of this procedure.

3.6. Welder Testing Procedure

Conduct welder qualification testing in the presence of a representative acceptable to KM. The testing welder is responsible for:

- All welding machine adjustments
- Pipe line-up and fit
- Electrode supply
- Branch connection layout, cut and fit
- Test coupon preparation
- The finished weld shall:
 - Exhibit a neat, uniform and workmanlike appearance
 - Be thoroughly brushed and cleaned
 - Meet all applicable visual inspection requirements in **L-O&M Procedure 406, Weld Inspection and Testing**

3.7. Destructively Testing a Weld

The testing welder will cut the test straps in the manner described by the applicable testing code under the tester's supervision at locations the applicable test requires. Any strap the welder does not prepare correctly will be considered a disqualified sample.

The welder will submit straps cut from welds to the tester or a contract laboratory for evaluation. The welder will identify each strap with welder's initials, weld test number and strap test type (i.e., tensile - T, nick - N, root - R, face - F, side - S) using a steel stamp or permanent paint-type metal marker (i.e., Nissoon). The straps will be destructively tested and evaluated in conformance with the applicable welding code. The tester will advise welders who fail a qualification test of the reason for failure.

3.8. Failed Test**3.8.1. In United States:**

A KM welder who fails any required qualification test for any procedure (API 1104, ASME Section IX or low hydrogen) will not be allowed to weld using that procedure until passing all qualification tests. The welder will retest according to the procedure in **Attachment 3** within 30 days of an unacceptable test notification.

A contract welder who fails any qualification test may be disqualified or have welding limitations as described in KM **L-O&M Procedure 456, Welding and Fabrication** and can retest every 30 days at the KM representative's discretion. The KM representative has the option of requesting a variance (**L-O&M Procedure 001, Standards Modification**, (Section 3.4) to retest the contract welder prior to the end of the 30-day period. The variance request must include acceptable proof of subsequent welder training that occurred after the initial test.

3.8.2. In Canada:

A KM welder who fails any required qualification test for any procedure will not be allowed to weld using that procedure until a retest is conducted and passed. The welder will retest within 30 days of an unacceptable test notification.

A contract welder who fails any qualification test may be disqualified or have welding limitations as described in KM **L-O&M Procedure 456, Welding and Fabrication** and can retest every 30 days at the KM representative's discretion. The KM representative has the option of requesting a variance (**L-O&M Procedure 001, Standards Modification**, (Section 3.4) to retest the contract welder prior to the end of the 30-day period. The variance request must include acceptable proof of subsequent welder training that occurred after the initial test.

3.9. Retesting due to conditions beyond the welder's control:

If, in the mutual opinion of KM and KM's representatives, a welder fails to pass the qualification test because of unavoidable conditions or conditions beyond his control, the welder may be given a second opportunity to qualify. Where a welder fails a test twice, no further retests shall be given until the welder has submitted proof of subsequent welder training that is acceptable to KM.

4. Training

Persons performing maintenance welding must be qualified in accordance with the KM Operator Qualification (OQ) Program per **L-O&M Procedure 199, Operator Qualification**.

5. Documentation

See **L-O&M Procedure 1404, Maps & Records** for retention for welder qualification documents. The construction site inspector will maintain copies of welders' qualification reports during the project period and all test reports will be filed in the final project report. Welders may be provided copies of test results.

5.1. In United States:

For destructive test qualification, the qualified welder tester must complete and send the appropriate forms to the appropriate KM representative:

- **L-OM400-01, Welder Qualification Test Report– Multiple Qualification – API 1104**
- **L-OM400-06, Welder Qualification Test Report**
- **L-OM400-07, Welder Qualification Test Report – Single Qualification – GMAW**
- **L-OM400-08, Welder Qualification Test Report – Single Qualification – SMAW**
- **L-OM400-09, ASME Welder Performance Qualification**
- **L-OM400-10 – Welder Qualification Test Report – Single Qualification – API 1104**

For x-ray qualification, complete **L-OM400-01, Welder Qualification Test Report– Multiple Qualification – API 1104** and **L-OM400-02, Radiographic Procedure Specification**. Send these forms along with the x-ray report and the NDT technician's qualifications (see **L-O&M Procedure 406, Weld Inspection and Testing**) to Codes and Standards or the appropriate KM representative.

See **L-O&M Procedure 1404, Maps & Records** for retention for welder qualification documents. The construction site inspector will maintain copies of welders' qualification reports during the project period and all test reports will be filed in the final project report. Welders may be provided copies of test results.

5.2. In Canada:

Records shall be made of the tests given to welders and of the detailed results of each test and documented on L-OM400-01C, Canada: Welder Qualification Test Report.

6. References

- 49 CFR Part 195.214 and 195.222
- NEB, OPR-99
- CSA, Z662-07, Oil and Gas Pipeline Systems
- ASME Section V – Nondestructive Examination (latest edition)
- ASME Section IX – Welding and Brazing Qualifications (2004 edition, including addenda through July 1, 2005)(49 CFR 195 and Z662-07 referenced edition)
- ASME B31.4 – Pipeline Transportation Systems for Liquid Hydrocarbons and Other Liquids, (latest edition)
- API 1104, (19th edition, 1999 including October 31, 2001 errata)(49 CFR 195 referenced edition)
- **L-O&M Procedure 001, Standards Modification**

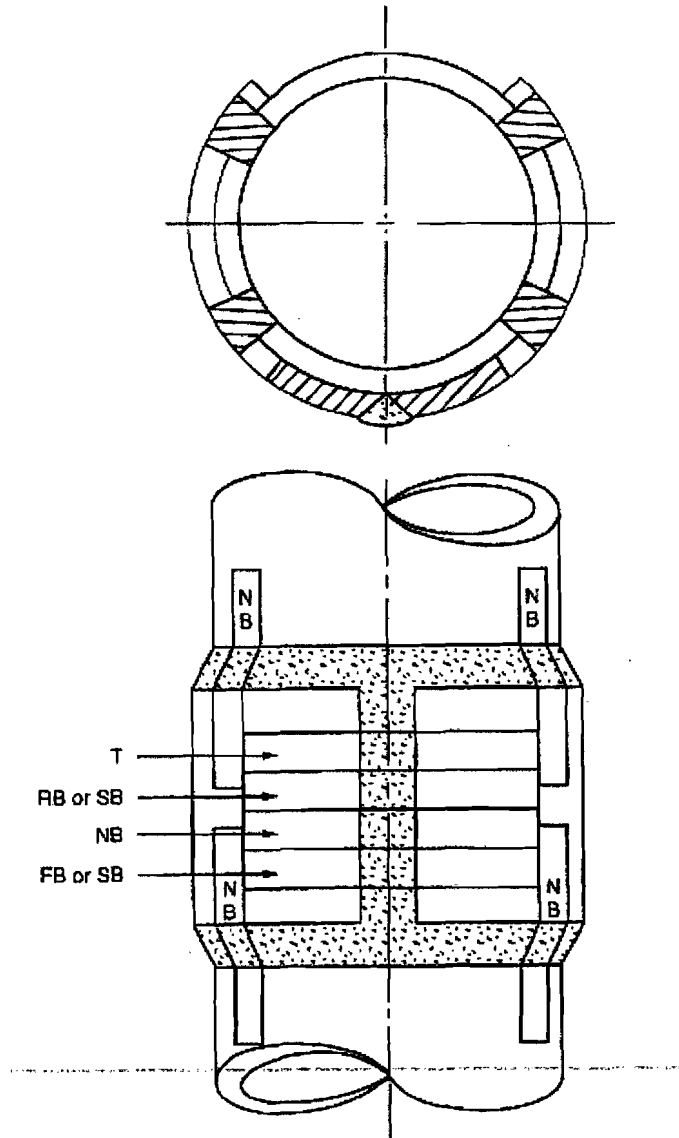
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- L-O&M Procedure 402, General Welding Specifications
 - L-O&M Procedure 406, Weld Inspection and Testing
 - L-O&M Procedure 407, Welding Procedures
 - L-O&M Procedure 456, Welding and Fabrication
 - L-O&M Procedure 1404, Maps & Records
 - L-OM400-01, Welder Qualification Test Report– Multiple Qualification – API 1104 or Canada Test
 - L-OM400-02, Radiographic Procedure Specification
 - L-OM400-06, Welder Qualification Test Report
 - L-OM400-07, Welder Qualification Test Report – Single Qualification – GMAW
 - L-OM400-08, Welder Qualification Test Report – Single Qualification – SMAW
 - L-OM400-09, ASME Welder Performance Qualification
 - L-OM400-10 – Welder Qualification Test Report – Single Qualification – API 1104

Table 1: Weld Specimen Requirements – API 1104 and Low Hydrogen

Pipe OD	Number of Specimens					Total
	Tensile Strength	Nick Break	Root Bend	Face Bend	Side Bend	
A) Girth Weld on 0.500-inch w.t. or less*						
12-3/4-inches OD	2**	2	2	0	0	6
> 12-3/4-inches OD	4**	4	2	2	0	12
B) Girth Weld on >0.500-inch w.t. *						
12-3/4-inches OD	2**	2	0	0	2	6
> 12-3/4-inches OD	4**	4	0	0	4	12
C) Branch Connection - All Sizes *	0	4	0	0	0	4
D) Low Hydrogen 12-inch Sleeve Groove*	1	1	1	1	0	4
Fillet*	0	4	0	0	0	4
After Initial Test, see Subsection 3.2 Test 2						
6"-0.432" Weld ***	0	0	0	0	4	4
2"-0.218" Weld ***	0	0	2	2	0	4

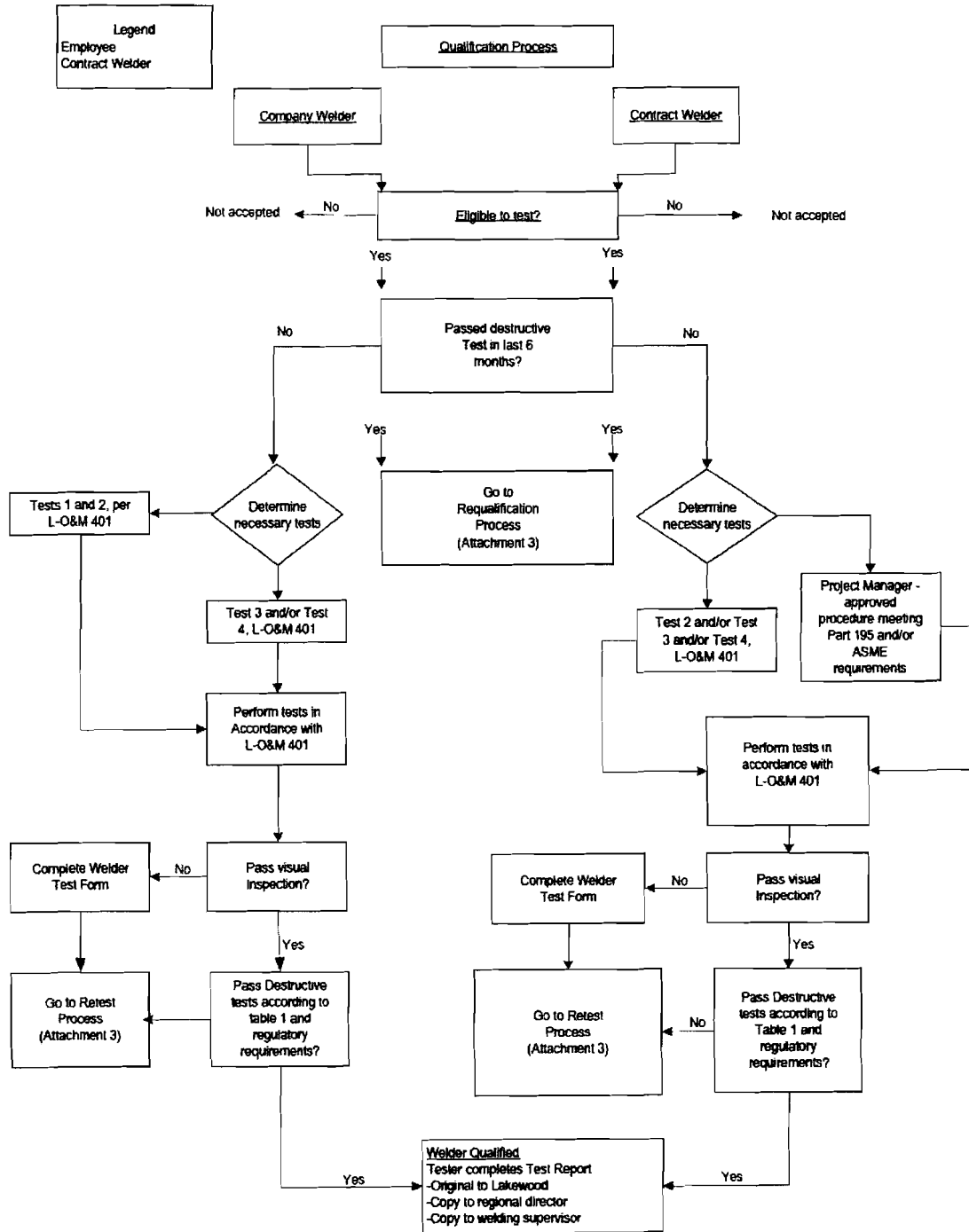
- * Specimens are to be tested in conformance with API 1104, Groove Weld - substitute two side bend tests for a root bend and face bend test when pipe wall thickness is greater than 1/2-inch.
- ** 1) Tensile strength calculations not required, must meet destructive and soundness requirements
 2) Nick break test may be conducted on these samples if tester desires – enter results in “Tensile Strength – Comments” section.
- *** Specimens are to be tested in conformance with ASME Section IX.

Attachment 1 - Specimens - Maintenance Welder Qualification Test



Note: T = Tensile; RB = Root Bend; FB = Face Bend;
NB = Nick Break, SB = Side Bend

Attachment 2 - Testing Procedure Chart



Attachment 3 - Testing Procedure Chart

Highlighting indicates revisions made as of the date on this procedure.

