



# SOUTHWEST GAS CORPORATION

Jerome T. Schmitz, P.E., Vice President/Engineering

June 16, 2016

*Via Email and U.S. Mail*

Kenneth Bruno  
Program Manager  
Gas Safety and Reliability Branch  
Safety and Enforcement Division  
State of California Public Utilities Commission  
505 Van Ness Avenue  
San Francisco, CA 94102

**Subject: General Order 112-E Inspection of Southwest Gas Corporation's Operations and Maintenance Plan, February 22-26, 2016**

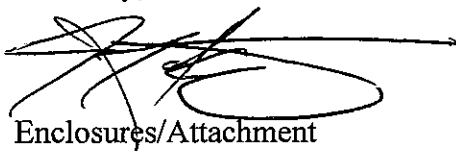
Dear Mr. Bruno,

Southwest Gas Corporation (Southwest Gas or Company) respectfully submits the attached response to the SED Summary of Inspection Findings letter for the General Order 112-E inspection of Southwest Gas' Operations and Maintenance Plan dated May 16, 2016.

Please note that in some instances, the Company's post-inspection email referenced Operations Manual changes that would take place in July 2016. Pursuant to Ms. Brown's email dated May 6, 2016, those dates have been moved to September 2016. Southwest Gas has noted the same, where applicable, in the attached response.

We appreciate Staff's consideration of this matter and look forward to discussing any questions or concerns that you may have.

Sincerely,



Enclosures/Attachment

cc: D. Lee (CPUC)   C. Mazzeo (SWG)   L. Brown (SWG)  
T. Eng (CPUC)   K. Lang (SWG)   V. Ontiveroz (SWG)  
D. Lee (CPUC)   E. Trombley (SWG)



## SUMMARY OF INSPECTION FINDINGS

### A. SED Findings

#### 1. Title 49 CFR §192.225(b) Welding procedures states:

*"Each welding procedure must be recorded in detail, including the results of the qualifying tests. This record must be retained and followed whenever the procedure is used."*

SWG Weld Procedure SBF-111 (SMAW Cellulose) refers the postheating (Post-weld Heat Treatment) procedure to the Operations Manual; however, a postheating procedure could not be located in the Operations Manual. SWG has not met the requirement of §192.225(b) for recording each welding procedure in detail.

SWG responded in a post-inspection email stating:

*"SWG agrees that the postheating procedure should be included in the Operations Manual and will complete it by the July 2016 Operations Manual revision"*

Therefore, SWG is in violation of §192.225(b) for not having details of one of the essential welding variables in its procedure.

#### Southwest Gas Response

Upon further review, it was determined that weld procedure SBF-111 provided during the inspection incorrectly cites a reference to the Operations Manual for the non-essential variable postheating. As indicated on the original weld qualification document (see attached), the procedure should state "none" for this non-essential variable. As the Company does not utilize postheating of welds, this negates the need to revise the Operations Manual to include such a procedure. Therefore, Southwest Gas respectfully disagrees that it is in violation of §192.225(b). In addition, Southwest Gas will review and revise all affected welding procedures replacing the incorrect Operations Manual reference with "none." The revisions will be included in the Company's January 2017 Operations Manual release.

#### 2. Title 49 CFR §192.619(a) Maximum allowable operating pressure: Steel or plastic pipelines states, in part:

*"No person may operate a segment of steel or plastic pipeline at a pressure that exceeds a maximum allowable operating pressure determined under paragraph (c) or (d) of this section, or the lowest of the following"*

SWG DS-Main and Service Design, Section 2.3.1.1 states:



*“Engineering Staff will be consulted for guidelines or other systems for which Southwest Gas has completed no qualification of MAOP.”*

SWG Design only discusses consulting Engineering Staff for guidelines to determine qualification procedures for systems which SWG has completed no qualification of MAOP. SWG responded in a post-inspection email stating:

*“DS-Main and Service Design, Section 2.3 is specific to newly acquired or other systems for which SWG has completed no qualification of MAOP, and intentionally does not include a reference to §192.619(a). The purpose of this section is to qualify the MAOP of a pipeline which may have been established under §192.619(a), (c), or (d). Since new pipelines have their MAOP established under §192.619(a), the company need a mechanism to qualify the MAOP of pre-code pipelines or pipelines acquired from other operators. As such, Section 2.3 was created to address those situations.”*

SWG does not include in its procedure explicit language requiring the determination of MAOP for newly acquired pipe or other systems for which SWG has unknown or incomplete qualification of MAOP. Therefore, SWG is in violation of §192.619(a), (c), or (d).

### **Southwest Gas Response**

Southwest Gas respectfully disagrees that it is in violation of §192.619(a), (c), or (d) as all gas facilities, whether installed by the Company or acquired from another operator, have an MAOP established in accordance with §192.619. The establishment of a gas facility's MAOP is separate and apart from the qualification of the MAOP. As noted above, the purpose of Section 2.3 is to qualify the MAOP previously established under §192.619(a), (c), or (d). Qualification of an MAOP is the process of confirming the previously established MAOP through a review of records to ensure the records accurately reflect the physical and operational characteristics upon which the MAOP is established. For newly acquired gas facilities in which the MAOP was established by the previous operator, or those systems in which Southwest Gas has yet to conduct a qualification of the MAOP, Section 2.3 requires Engineering Staff be consulted for guidelines to determine the qualification process for such facilities.

## **B. Areas of Concern / Observations / Recommendations**

### **1. Corrosion Control**

#### **1.1 Title 49 CFR §192.452(a) states:**

*“Converted pipelines. Notwithstanding the date the pipeline was installed or any earlier deadlines for compliance, each pipeline which qualifies for use under this part in accordance with §192.14 must meet the requirements of this subpart specifically applicable to pipelines installed before August 1, 1971, and all other applicable requirements within 1*



*year after the pipeline is readied for service. However, the requirements of this subpart specifically applicable to pipelines installed after July 31, 1971, apply if the pipeline substantially meets those requirements before it is readied for service or it is a segment which is replaced, relocated, or substantially altered.”*

SWG had indicated to SED during the inspection that SWG does not have a procedure that addresses 192.452 because this code section does not apply to their system. SED recommended SWG include a statement in their O&M plan indicating that 192.452(a) does not apply to their system.

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the January 2017 Operations Manual update.

This note serves only for the purpose of record and SWG need not respond. SED will check the update in future inspections.

#### **Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company's January 2017 Operations Manual release.

#### **1.2 Title 49 CFR §192.455(c) External corrosion control: Buried or submerged pipelines states:**

*“An operator need not comply with paragraph (a) of this section, if the operator can demonstrate by tests, investigation, or experience that—*  
*(1) For a copper pipeline, a corrosive environment does not exist; or*  
*(2) For a temporary pipeline with an operating period of service not to exceed 5 years beyond installation, corrosion during the 5-year period of service of the pipeline will not be detrimental to public safety.”*

SWG had indicated to SED during the inspection that SWG does not have a procedure that addresses 192.455(c) because this code section does not apply to their system. SED recommended SWG include a statement in their O&M plan indicating that 192.455(c) does not apply to their system.

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the January 2017 Operations Manual update.

This note serves only for the purpose of record and SWG need not respond. SED will check the update in future inspections.



**Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company's January 2017 Operations Manual release.

**1.3 Title 49 CFR §192.463(c) External corrosion control: Cathodic protection states:**

*"The amount of cathodic protection must be controlled so as not to damage the protective coating or the pipe."*

SWG CC-Corrosion Control Policy, Section 2.2.7 states:

*"The amount of cathodic protection must be controlled so as not to damage the protective coating or the pipe. This is accomplished by limiting the maximum "on" pipe-to-soil potential to -2.500 volts."*

Industry practice suggests limiting the maximum "on" pipe-to-soil potential to -2.0 volts to prevent damage to the protective coating. SED has requested SWG provide engineering justification in order to substantiate the -2.500 volts value, but SWG has not provided a response yet.

**Southwest Gas Response**

Southwest Gas is aware of industry accepted criteria for limiting the maximum "instant off" potentials in order to limit possible coating damage; however, it is not aware of an industry practice to limit the maximum "on" pipe-to-soil potential to -2.0 volts.

The Company's engineering justification for limiting the maximum "on" pipe-to-soil potential to -2.500 volts is based on the areas where its service territories are located, which are higher in resistivity and thus cause voltage gradients to be higher in general for "on" readings. In those instances in which voltage potentials more negative than -2.500 volts are observed Engineering Services, Corrosion Control is notified. Engineering Services, Corrosion Control will then request that an "instant off" voltage potential test be conducted to determine if there is any possibility of coating damage. Additionally, coating inspections conducted by the Company have not identified damage to the protective coating or pipe attributed to cathodic protection.

**1.4 Title 49 CFR §192.465(a) External corrosion control: Monitoring states:**

*"Each pipeline that is under cathodic protection must be tested at least once each calendar year, but with intervals not exceeding 15 months, to determine whether the cathodic*



*protection meets the requirements of §192.463. However, if tests at those intervals are impractical for separately protected short sections of mains or transmission lines, not in*

*excess of 100 feet (30 meters), or separately protected service lines, these pipelines may be surveyed on a sampling basis. At least 10 percent of these protected structures, distributed over the entire system must be surveyed each calendar year, with a different 10 percent checked each subsequent year, so that the entire system is tested in each 10-year period."*

SED recommends SWG state in its procedures how it plans to address short sections of pipe for which test readings barely meet the minimum acceptable cathodic protection requirements. For example, if SWG read -0.86 volts on a short section of pipe, will it take any remedial measures to ensure it will remain adequately protected until the next inspection approximately 10 years from now?

#### **Southwest Gas Response**

Southwest Gas appreciates SED's recommendation but does not believe its Corrosion Control Policies and Procedures require revision at this time. Southwest Gas would like to make the SED aware of the following:

- In 2009, Southwest Gas commissioned a study with the Gas Technology Institute (GTI) regarding anode effectiveness on the Company's gas facilities. The objective of the study was to quantify soil moisture, chemistry, conductivity, installation practices, or other factors that determine the effectiveness of cathodic protection provided by sacrificial anodes specific to one-pound anodes used to protect isolated steel service risers. The study concluded that a service life of 20 years or more will be seen in the majority of installations.
- With the introduction of anodeless risers, the population of risers addressed under §192.465 continues to decline year after year as those risers and associated service lines are replaced.
- The Company, through its Distribution Integrity Management Program (DIMP), actively monitors corrosion on risers. Material Investigations are required on all leaking risers and all non-leaking risers that are removed from service exhibiting corrosion.
- Corrosion Control training emphasizes installing an additional anode in those instances as described in SED's example above.

#### **1.5 Title 49 CFR §192.465(e) External corrosion control: Monitoring states:**

*"After the initial evaluation required by §§192.455(b) and (c) and 192.457(b), each operator must, not less than every 3 years at intervals not exceeding 39 months, reevaluate its*



*unprotected pipelines and cathodically protect them in accordance with this subpart in areas in which active corrosion is found. The operator must determine the areas of active corrosion by electrical survey. However, on distribution lines and where an electrical survey is impractical on transmission lines, areas of active corrosion may be determined by other means that include review and analysis of leak repair and inspection records, corrosion monitoring records, exposed pipe inspection records, and the pipeline environment."*

SWG CC-Corrosion Control Policy, Section 2.3.6 states:

*"Cathodic protection facilities must be monitored (at a minimum) at the frequency indicated in the table below:"*

Facility	Frequency
<ul style="list-style-type: none"><li>Exposed steel pipe</li><li>Unprotected buried pipe (pre-August 1, 1971)</li></ul>	1 time every 3 years, intervals not to exceed 39 months

SWG does not provide information on the type of inspection being conducted. SED recommends SWG include additional language in their procedures to address the type of inspection they will conduct.

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the July 2016 Operations Manual revision.

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

#### **Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company's September 2016 Operations Manual release.

#### **1.6 Title 49 CFR §192.469 External corrosion control: Test stations states:**

*"Each pipeline under cathodic protection required by this subpart must have sufficient test stations or other contact points for electrical measurement to determine the adequacy of cathodic protection."*

SWG does not conduct resurveys of test stations to validate that there are sufficient test stations or other contact points for electrical measurement to determine the adequacy of



cathodic protection. Periodic resurveys (e.g. once every five or six years) would validate the cathodic protection system with a changing gas system.

SED requests SWG provide engineering justification in order to substantiate not conducting periodic resurveys.

SWG responded in a post-inspection email that they could not locate any references to resurveying test stations in any PHMSA documentation.

SED recommends having a resurvey of test stations for the reasons mentioned above.

#### **Southwest Gas Response**

Southwest Gas believes the CC-Corrosion Control Policy, Section 2.5 – External Electrical Test Stations exceeds the requirements of 49 CFR 192.469, and that a resurvey of test stations is not necessary at this time. The maximum spacing requirements established in Section 2.5.3 ensure that as the pipeline systems change, the Company will install a sufficient number of test stations.

#### **1.7 Title 49 CFR §192.477 Internal corrosion control: Monitoring states:**

*“If corrosive gas is being transported, coupons or other suitable means must be used to determine the effectiveness of the steps taken to minimize internal corrosion. Each coupon or other means of monitoring internal corrosion must be checked two times each calendar year, but with intervals not exceeding 7½ months.”*

SWG CC-Corrosion Control Section I Procedure, Section 5.2.3 states:

*“Any time a section of steel pipeline is removed or abandoned from the system and the internal surface exposed, or the pipeline is tapped and the coupon is retained, the internal surface of the pipe and/or coupon must be visually inspected for signs of corrosion.”*

SWG procedures do not address 192.477 as the procedures do not include remedial actions or intervals for monitoring internal corrosion.

During the inspection, SWG explained to SED that they only accept pipeline quality gas from their suppliers, so no corrosive gas is transported in their system. SED recommends SWG include additional language in their procedures to state that SWG only accepts pipeline quality gas and that there is no corrosive gas in their system.

SWG responded in a post-inspection email stating:

*“SWG agrees with this recommendation to add language to the Operation manual to state that SWG only accepts pipeline quality gas into our system. This will be included with the July 2016 Manual revision.”*





SWG also clarified that SWG CC-Corrosion Control Section 1 Procedure, Section 5.2.3 as:

*“Southwest Gas would like to clarify the comment regarding monitoring if IC is discovered. As Southwest Gas does not transport corrosive gas in its system, the monitoring requirement in 192.477 is not applicable. Notwithstanding, Southwest Gas policy CC Section I Procedure: Section 5.2.3 addresses remedial action if IC is found. Also, as a point of clarification, the coupon referenced in 5.2.3 is a piece of the pipeline obtained as a result of the tapping operation. This type of coupon is not the same as the coupon used in 192.477 for the purpose of monitoring IC.”*

SED agreed with the corrective plan and the clarification.

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

#### **Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual for CC-Corrosion Control Policy, Section 3.1.1. The relevant revisions will be included in the Company's September 2016 Operations Manual release.

## **2 Abandonment or deactivation of facilities**

### **2.1 Title 49 CFR §192.727(b) Abandonment or deactivation of facilities states:**

*“Each pipeline abandoned in place must be disconnected from all sources and supplies of gas; purged of gas; in the case of offshore pipelines, filled with water or inert materials; and sealed at the ends. However, the pipeline need not be purged when the volume of gas is so small that there is no potential hazard.”*

SWG OPS-Abandonment Procedure, Section 1.1.2.3 states:

*“Lines do not need to be purged when the volume of gas is so small that no potential hazard exists.”*

SWG does not have a cutoff value or criteria for when a volume of gas is so small that there is no potential hazard. SED recommends setting a cutoff value or other clear criteria for when purging is not required, for consistent application throughout its system.

#### **Southwest Gas Response**

Southwest Gas appreciates the SED's recommendation and will further research this issue.



**2.2 Title 49 CFR §192.727(g) Abandonment or deactivation of facilities states:**

*“For each abandoned offshore pipeline facility or each abandoned onshore pipeline facility that crosses over, under or through a commercially navigable waterway, the last operator of that facility must file a report upon abandonment of that facility.”*

SWG had indicated to SED during the inspection that SWG does not have a procedure that addresses 192.727(g) because they do not have this type of pipeline. SED recommended SWG include a statement in their O&M plan indicating that 192.727(g) does not apply to their system.

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the January 2017 Operations Manual update.

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

**Southwest Gas Response**

SED's post-inspection email recommended that Southwest Gas have a code referencing matrix of its procedures and to note those code sections that do not apply. Southwest Gas agrees with that recommendation and will create a matrix noting the code section and the applicability to its operations. The matrix will be completed by December 31, 2016.

**3 Title 49 CFR §192.621 Maximum allowable operating pressure: High-pressure distribution systems states, in part:**

*“(a) No person may operate a segment of a high pressure distribution system at a pressure that exceeds the lowest of the following pressures, as applicable:*

...

*(4) The pressure limits to which a joint could be subjected without the possibility of its parting.”*

SWG procedures do not consider the pressure limits to which a joint could be subject without the possibility of its parting.

SWG responded in a post-inspection email stating:

*“ DS-Main and Service Design, Section 2.2.1 states the MAOP of a new pipeline system or segment may not exceed the lowest component design pressure, which is in accordance with §192.621. However, SWG does not intentionally address §192.621(a)(4) in the design section of the manual as this requirement is covered under SWG's material specifications for the applicable fitting or qualification of the applicable joining procedure.”*



The SWG's material specification states:

*"All fittings must be capable of operating at 60 psig and 140°F (60°C) simultaneously."*

This is in accordance with the DS-main and Service Design, Section 2.2.1 which states:

*"60 psig for plastic pipelines installed after 1970, unless Engineering Staff approves a waiver for higher pressure."*

SED recommends SWG reference the material specification in its Operations and Maintenance manual (which is to be reviewed annually) to address the §192.621(a)(4) requirement.

#### **Southwest Gas Response**

Southwest Gas appreciates the SED's recommendation. Although the Company believes its material specifications for the applicable fitting or qualification of the applicable joining procedures satisfy the requirements of 192.621(a)(4), the Company will revise its Operations Manual, Main and Service Design, Section 2.2.1. to reflect the requirements of §192.621(a)(4). This revision will be included in the September 2016 Operations Manual release.

#### **4 Title 49 CFR §192.553(a) Upgrading General requirements states:**

*"Pressure increases. Whenever the requirements of this subpart require that an increase in operating pressure be made in increments, the pressure must be increased gradually, at a rate that can be controlled"*

SWG DS-Increase in MAOP or MOP Design discusses the increments that must be used to increase operating pressure, however it does not discuss the duration or rate at which each increment must be held.

SWG responded in a post-inspection email stating:

*"Increase in MAOP or MOP Design, Sections 1.4 Leak Survey requires a leak survey after each incremental pressure increase. As noted in procedure, the pressure will not be increased to the next increment until the survey is completed and all potentially hazardous leaks repaired."*

SED recommends SWG include details in its procedures to address the duration or rate at which each increment must be held.



### **Southwest Gas Response**

Southwest Gas agrees with this recommendation and will revise its Operations Manual, Increase in MAOP or MOP Design, Section 1.4.2, to state: "A leak survey will be conducted as soon as practicable following each incremental pressure increase and will be completed prior to the next incremental pressure increase. The pressure of each incremental increase will be maintained for the duration of the leak survey." This revision will be included in the January 2017 Operations Manual release.

## **5 Welding Procedures**

### **5.1 Title 49 CFR §192.225(a) Welding procedures states:**

*"Welding must be performed by a qualified welder or welding operator in accordance with welding procedures qualified under section 5, section 12, or Appendix A of API Std 1104 (incorporated by reference, see §192.7) or section IX ASME Boiler and Pressure Vessel Code (BPVC) (incorporated by reference, see §192.7), to produce welds which meet the requirements of this subpart. The quality of the test welds used to qualify welding procedures must be determined by destructive testing in accordance with the referenced welding standard(s)."*

SWG OPS-Steel Welding Policy, OPS-Steel Welding Procedure, and OPS-Pipe Joining and Qualification Disqualification Policy do not address the test requirements of a qualified weld procedure. SWG had indicated to SED during the inspection that SWG has a contractor perform the test for them.

SWG responded in a post-inspection email stating:

*"Southwest Gas weld procedures are developed and qualified in accordance with API 1104 Section 5 as noted in section 8.1.2.1 of the Steel Welding Procedure. Southwest Gas is not aware of a requirement in Code to have a written procedure on how the weld procedures are qualified"*

SED recommends SWG to have a written procedure to satisfy the requirements of API 1104, Section 5.

### **Southwest Gas Response**

Southwest Gas appreciates the SED's recommendation but does not believe its Steel Welding Policies and Procedures require revision at this time. As previously noted, Southwest Gas weld procedures are developed and qualified in accordance with API 1104 Section 5 as contained within section 8.1.2.1 of the Steel Welding Procedure. Additionally, the original weld qualification procedure for SBF-111, included as an attachment to SED's Finding 1, documents the API 1104 Section 5 testing requirements.



**5.2 Title 49 CFR §192.225(a) Welding procedures states:**

*“Welding must be performed by a qualified welder or welding operator in accordance with welding procedures qualified under section 5, section 12, or Appendix A of API Std 1104 (incorporated by reference, see §192.7) or section IX ASME Boiler and Pressure Vessel Code (BPVC) (incorporated by reference, see §192.7), to produce welds which meet the requirements of this subpart. The quality of the test welds used to qualify welding procedures must be determined by destructive testing in accordance with the referenced welding standard(s).”*

SWG OPS-Steel Welding Procedure, Section 8.1.4 states:

“The Individual qualified weld procedure specifications are indicated below:

1. SMAW (cellulose)
2. SMAW (low-hydrogen)
3. GMAW”

GMAW is listed but SWG does not have a corresponding procedure. SWG had indicated to SED during the inspection that SWG no longer uses GMAW and that they would be removing the reference from their procedures.

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the July 2016 Operations Manual revision.

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

**Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company's September 2016 Operations Manual release.

**6 Nondestructive Testing Procedure**

**6.1 Title 49 CFR §192.243(d) Nondestructive testing states, in part:**

*“When nondestructive testing is required under §192.241(b), the following percentages of each day's field butt welds, selected at random by the operator, must be nondestructively tested over their entire circumference...”*

SWG DS-Pipe and Component Testing Design, Section 1.5 addresses the percentages of each day's field butt welds to be nondestructively tested; however, it does not specifically



state that the welds must be tested over their entire circumference. SED recommends SWG include additional language in DS-Pipe and Component Testing Design, Section 1.5 to state that SWG will nondestructively test welds over their entire circumference.

SWG responded in a post-inspection email stating:

*“Southwest Gas does agree that language should be added to state that the entire circumference of the pipe should be NDT’ed. This will be included with the July 2016 Operations Manual revision. Regarding the recommendation to add the information contained in Section 1.5 of the Pipe and Component Testing Design to OPS Welding Procedure, Section 6 (Nondestructive Testing), it should be noted that Pipe and Component Testing Design, Section 1.5, is the design which states when NDT is required or may be utilized, while the Welding Procedure Section 6 is the procedural requirements.”*

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

#### **Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company’s September 2016 Operations Manual release.

#### **6.2 Title 49 CFR §192.243(f) Nondestructive testing states:**

*“When nondestructive testing is required under §192.241(b), each operator must retain, for the life of the pipeline, a record showing by milepost, engineering station, or by geographic feature, the number of girth welds made, the number nondestructively tested, the number rejected, and the disposition of the rejects.”*

SWG OPS-Welding Procedure Section 6 (Nondestructive Testing) does not clearly address the documentation requirements of 192.243(f). SED recommends SWG include additional language in its procedures to address the documentation requirements of 192.243(f).

SWG responded in a post-inspection email stating they agree with this recommendation and will complete it by the July 2016 Operations Manual revision.

This note serves only for the purpose of record and SWG need not respond.

#### **Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company’s September 2016 Operations Manual release.



**7 Test Requirements**

**7.1 Title 49 CFR §192.503(c) General requirements states:**

*“Except as provided in §192.505(a), if air, natural gas, or inert gas is used as the test medium, the following maximum hoop stress limitations apply:”*

<b>Class location</b>	<b>Maximum hoop stress allowed as percentage of SMYS</b>	
	<b>Natural gas</b>	<b>Air or inert gas</b>
1	80	80
2	30	75
3	30	50
4	30	40

SWG has 3 sections in its procedures to address the §192.503(c) requirements. These 3 sections are listed below.

a) SWG DS-Pipe and Component Testing Design, Section 1.3.4 states:

*“The test medium must be limited to the maximum hoop stresses listed in Table 5 based on the class location of the area where the standup test is performed. This requirement applies to both buried and aboveground piping.”*

<b>MAXIMUM HOOP STRESS ALLOWED AS PERCENTAGE OF SMYS DURING STANDUP TESTS</b>				
<b>Test Site Class Location</b>	<b>Test Medium</b>			
	<b>Natural Gas</b>	<b>Air Or Nitrogen</b>		<b>Water</b>
	<b>Pipelines and Fabricated Assemblies</b>	<b>Pipelines</b>	<b>Fabricated Assemblies</b>	<b>Pipelines and Fabricated Assemblies</b>
1	50	50	80	100



2	30	50	75	100
3	30	50	50	100
4	30	40	40	100

b) SWG DS-Pipe and Component Testing Policy Section 1.2.2 states:

*"A minimum standup test pressure that will produce a stress level of 90% of SMYS in the pipeline is recommended when feasible to qualify a pipeline for an MAOP that produces a hoop stress in the pipeline equal to or greater than 20% of SMYS. This also applies to existing transmission pipelines requiring a standup test as part of the integrity assessment."*

c)

Summary of Testing Requirements For a Pipeline With an MAOP That Produces A Hoop Stress in the Pipeline of Equal to or Greater than 20% of SMYS			
Description of Segment	Installed pipeline (including pipelines with installed fabricated assemblies)	Pre-installation fabricated assemblies (and short sections of pipe)	Existing pipelines in service (including pipelines with installed fabricated assemblies) to determine its integrity
Test Medium <sup>1</sup>	Water, air, nitrogen or natural gas	Water, air, nitrogen or natural gas	Water, air, nitrogen or natural gas
Minimum test pressure	To equal to or greater than 90% of SMYS <sup>2</sup> Required minimum: Class 1 - 1.25 x MAOP Classes 2, 3, and 4 - 1.5 x MAOP	Required minimum: 1.5 x MAOP	To equal to or greater than 90% of SMYS <sup>2</sup> Required minimum: Refer to Table 2
<sup>1</sup> Test medium subject to the limitations of this section.			
<sup>2</sup> Recommended if equipment, fittings, and other materials necessary to achieve 90% of SMYS are available			

DS-Pipe and Component Testing Design, Section 1 Table 1

SWG Section 1.3.4 is in compliance with §192.503(c). However, DS-Pipe and Component Testing Policy Section 1.2.2 and DS-Pipe and Component Testing Design, Section 1 Table 1 and are not in compliance with §192.503(c) because a hoop stress of 90% would exceed the allowable limits if using natural gas, air, or inert gas as a test medium.

SWG responded in a post-inspection email stating:

*"it is Southwest Gas policy to test at 90% SMYS subject to footnote #2 in Table 1 of DS-Pipe and Component Testing Design, Section 1.1.1. In addition, footnote #1 states "Test Medium subject to the limitations of this section."*





The footnotes do not explain or define the test medium and equipment limitations. SED recommends SWG clarify its procedures to consistently address the minimum requirements of 192.503(c).

**Southwest Gas Response**

Southwest Gas agrees with this recommendation and will revise DS-Pipe and Component Testing Design, Section 1.1, Table 1 and DS-Pipe and Component Testing Policy, Section 1.2.2 to clarify its procedures. The relevant revisions will be included in the Company's September 2016 Operations Manual.

**7.2 Title 49 CFR §192.517(a) Records states, in part:**

*“(a) Each operator shall make, and retain for the useful life of the pipeline, a record of each test performed under §§192.505 and 192.507. The record must contain at least the following information:*

- (1) The operator's name, the name of the operator's employee responsible for making the test, and the name of any test company used.*
- (2) Test medium used.*
- (3) Test pressure.*
- (4) Test duration.*
- (5) Pressure recording charts, or other record of pressure readings.*
- (6) Elevation variations, whenever significant for the particular test.*
- (7) Leaks and failures noted and their disposition.”*

SWG OPS-Pipe and Component Testing Procedure, Section 1.12.3 does not adequately address (1), (5), (6), and (7) of §192.517(a).

SWG responded in a post-inspection email stating the requirements in §192.517(a) are contained in DS-Pipe and Component Testing Design, Section 1.8 and DS-Pipe and Component Testing Policy, Section 1.6. SWG agrees to revise OPS-Pipe and Component Testing Procedure, Section 1.12.3 to include all the required information in §192.517(a).

This note serves only for the purpose of record and SWG need not respond. SED will check the updates in future inspections.

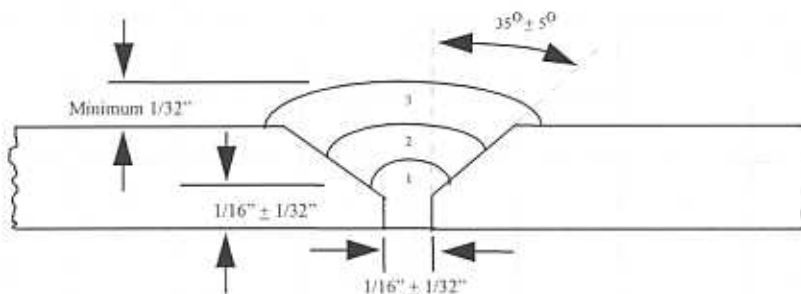
**Southwest Gas Response**

As indicated, Southwest Gas will revise its Operations Manual to address this issue. The relevant revisions will be included in the Company's September 2016 Operations Manual release.

Essential Variables

Material Qualified

- |                          |   |            |
|--------------------------|---|------------|
| A. Process:              | Manual  |            |
| B. Material:             | 42,000# SMYS and under  | API 5LX-42 |
| C. Outside diameter:     | Less than 2.375"  | 1.66"OD    |
| D. Wall Thickness:       | Less than .188"   | .140" WT   |
| E. Filler Metal:         | Group 1   | E6010      |
| F. Position:             | Fixed   |            |
| G. Direction of Welding: | Downhill  |            |
| H. Time Between Passes:  | Maximum 5 minutes between completion of root bead and the start of the 2 <sup>nd</sup> bead |            |
| I. Shielding Flux:       | Cellulose   |            |
| J. Speed of Travel:      | 6-16 IPM  |            |
| K. Polarity:             | DCRP  |            |
| L. Joint Design:         |   |            |



Non-Essential Variables:

- |                                   |   |
|-----------------------------------|---|
| M. Time Between Remaining Passes: | Maximum 36 hours to completion of weld              |
| N. Cleaning and Grinding:         | Power / hand tools                                  |
| O. Preheating                     | None (required when pipe temperature is below 40°F) |
| P. Postheating:                   | None  |
| Q. Line-up Clamp:                 | None  |
| R. Electrode Type                 | E6010   |

Electrode Size and Number of Beads

Minimum # of Beads and Sequence	Electrode Size (Diameter)	Voltage	Amperage
1 Root Pass	1/8" E6010	16-40	75-130
2 Hot Pass	1/8" E6010	16-40	75-130
Fillers (when required)	1/8" E6010	16-40	75-130
Cap			

Note: Any change in non-essential variables must be selected from options on the reverse of this form and documented.

Welder: Mike Davis

Tested By: Vern Sullivan

Date: 07/12/00

Approved By: Bill Chunn

Date: 07/12/00

X	P
No Preheat	Preheat
X	
	X

X	I	E
No Clamp	Internal	External
X		
	X	
		X

6
E6010
X

SBF - 111

First Pass (Root Bead)			Second Pass (Hot Pass)			Remaining Passes (Fillers and Cap)			
3/32"	1/8"	5/32"	3/32"	1/8"	5/32"	1/8"	5/32"	3/16"	
	X			X		X			A
	X			X			X		B
	X				X		X		C
		X			X		X		D
	X				X			X	E
X				X		X			F
X			X			X			G

	<u>AMP</u>	<u>VOLT</u>
3/32"	40-70	15-35
1/8"	75-130	16-40
5/32"	90-175	17-40
3/16"	140-225	18-45

**ADDITIONAL OPTIONS OF NON-ESSENTIAL VARIABLES ARE ONLY AVAILABLE THROUGH APPROVAL BY OPERATIONS STAFF.**

**SWG WELDING PROCEDURE TEST REPORT**  
**WELDING PROCEDURE SPECIFICATION # SBF-111**

Bead Seq & # of Passes	Rod Size	Rod Classification	Voltage	Amperage	Current & Polarity	IPM	Direction	
							UP	DOWN
1	1/8"	E6010	23-33	67-77	DCRP	8		X
2	1/8"	E6010	23-33	65-77	DCRP	6		X
3	1/8"	E6010	22-32	65-75	DCRP	6		X
4								
5								
6								

Rod Group: Group 1

Flux Type: Cellulose

Line-Up Clamp Used:  Internal  External  None

If clamp used, remove after: N/A % of Root Bead

W.T. .140" O.D. 1.66"

Number of Welders: One

Material Grade: API 5LX-42

Pipe Certification Attached:  Yes  No

Process:  OXY  SMAW  GMAW  Other \_\_\_\_\_

Manual  Other

Position:  Roll  Fixed

Cleaning:  Power Tools  Hand Tools

Grinding:  Power Tools  Hand Tools

Preheat: N/A Post Heat: N/A

Test Conducted At: Tempe Operations Center

Welded By: Mike Davis Date: 07/12/00

Tested By: Vern Sullivan Date: 07/12/00

Approved By: Bill Chunn Date: 07/12/00

Passed  Failed

**SWG WELDING PROCEDURE TEST REPORT  
PROCEDURE SPECIFICATION #**

COUPON #	WIDTH (IN.)	W. T. (IN.)	AREA	TYPE OF TEST				REMARKS	
				TENSILE		GUIDED BEND			NICK BREAK
				LOAD (LBS.)	ULTIMATE	FACE	ROOT		
#1	1"	.166"					X	Ok	
#2	1"	.166"						X	Clean
#3	1"	.166"					X		Ok
#4	1"	.166"						X	Clean
#5									
#6									
#7									
#8									
#9									
#10									
#11									
#12									
#13									
#14									
#15									
#16									

**ALL WELDS TESTED IN ACCORDANCE WITH API-1104, 18<sup>TH</sup> EDITION**

ROSENBERG, TEXAS 77471  
 (713) 342-5401  
 800-231-5984

**Quanex**  
**GULF STATES TUBE DIVISION ROSENBERG, TEXAS 77471**

INVOICE NUMBER	CUSTOMER ORDER NUMBER	DATE	OFC	COM	DIW	NET SLS	GR SLS	ACCOUNT NUMBER	US	PA
9428	114878	09/22/97	49	00	16	20	01	05322000000	BP	VER

S H I P T O	KELLY PIPE COMPANY INC	KELLY PIPE COMPANY INC	SN
	11700 S BLOOMFIELD AVE	11700 S. BLOOMFIELD AVE	TR
T O	SANTA FE SPRINGS CA 90670	SANTA FE SPRINGS CA 90670	INV

ROUTING  
 COL CUST TRK - TR W/SHPT, NO FAIL

ANALYSIS	SHAPE	PRODUCT	PS	HEAT TREATMENT	INSPECTION
PER SPEC	ROUND	HOT FINISH		PER SPEC	SEE BELOW
SEAMLESS	ASTM/ASME A/SA 106 B 94	HF CARBON PIPE			10/31/97 REV. 10/14/97

SPECIAL INSTRUCTIONS:  
 SCH: 10-31-97 OR B4  
 PLAIN ENDS - UVC COATED  
 PERMISSIBLE OVERAGES ACCEPTABLE

*BPC-10920-282*

ITEM	QUANTITY	O.D.	I.D.	WALL	LENGTH	WT/FT	WEIGHT	REMARKS
1	6,240'	1.660		.140 AVG	RAND 17' 24'	2.273	14.184	Complete 296 Pcs. 6,665'
		:-1/4" SCH 40						TEST REPORTS WITH SHIPMENT, NO FAIL
								.166 WALL

HEAT NO.	C	Mn	P	S	SI	Ni	Cr	Mo	Cu	Pb	REMARKS
205374	.21	.87	.009	.013	.21	.08	.06	.02	.15		V .001
	.21	.87	.010	.014	.21	.08	.06	.02	.15		V .001

FLATTEN	FLARE	FLANGE	REV. FLATTEN	HYDRO TEST	BEND	EDDY CURRENT
				2500 psi OK	OK	

HEAT NO.	ULT. STR. PSI	YIELD PSI	ELONG 2"	HARDNESS	HEAT NO.	ULT. STR. PSI	YIELD PSI	ELONG 2"	HA
205374	81800	53300	46.0						

ADVANCE TESTS

I CERTIFY THAT THE MATERIAL HEREIN DESCRIBED HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE ORDERED SPECIFICATION AND THAT THIS TEST INFORMATION IS CORRECT AS CONTAINED IN THE RECORDS OF THE COMPANY.

*Dwayne Collier*  
 TECHNICAL ANALYST

GST-423 REV. 5/84

SWORN TO AND SUBSCRIBED BEFORE ME THIS  
 \_\_\_\_\_ DAY OF \_\_\_\_\_

NOTARY