Henry L. Leger
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February 22, 2013

Mr. Rodrick M. Seeley, Director, Southwest Region, Office of Pipeline Safety
U.S. Department of Transportation
Pipeline Hazardous Materials Safety Administration
8701 South Gessner, Suite 1110
Houston, TX 77074

RE: **Chevron Pipe Line Company – Formal Response**
Notice of Amendment - CPF 4-2012-5033M

Dear Mr. Seeley,

Pursuant to the captioned US DOT PHMSA Notice of Amendment CPF No. 4-2012-5033M, this letter, with enclosures, is Chevron Petrochemical Pipeline Company LLC's (Federal Operator ID No. 31554) / Chevron Pipe Line Company's (CPL) (Federal Operator ID No. 02731) formal response regarding its procedural revisions in order to comply with 49 CFR Part 195.52, and 49 CFR Part 195.402.

Enclosed are the revised sections of the procedures cited by the NOA that required revising. Each revision is highlighted in yellow.

For your reference, along with the revised procedures, enclosed is a copy of the OPS Notice of Amendment, the CPL request for extension and the OPS grant of extension.

Should you have any questions, please contact me.

Sincerely,

Henry L. Leger
DOT Pipeline Safety Specialist

enclosures: OPS Notice of Amendment - CPF 4-2012-5033M;
CPL request for time extension for eesponse - CPF 4-2012-5033M;
OPS grant of time extension for response - CPF 4-2012-5033M;
CPL Core O&M Section 8.2.1- Telephonic Notifications;
CPL Core Emergency Response Section 9; and
CPL Maintenance & Inspection Procedure, MIP-403 Section 5.

ec: R.M. Seeley – OPS
John Pepper – OPS
Saurabhkumar Desai – OPS
Gary Saenz – CPL

VIA USPS Certified Mail – Return Receipt Requested
Article Number – 7005 1160 0003 1420 4493

Henry L. Leger
DOT Pipeline Safety Specialist

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November 27, 2012

Facsimile Delivery via e-mail to:
Rodrick.M.Seeley@dot.gov

Mr. Rodrick M. Seeley, Director, Southwest Region, Office of Pipeline Safety
U.S. Department of Transportation
Pipeline Hazardous Materials Safety Administration
8701 South Gessner, Suite 1110
Houston, TX 77074

RE: **CPF 4-2012-5033M** – Request for Time Extension

Dear Mr. Seeley,

With this letter, Chevron Petrochemical Pipeline Company LLC (CPP), Federal Operator ID No. 31554 / Chevron Pipe Line Company (CPL), Federal Operator ID No. 02731 are respectfully requesting a ninety (90) day extension in order to adequately address the issues as outlined in your Notice of Amendment (NOA) letter dated November 2, 2012. CPL is presently working through the process of reviewing, and amending where necessary, those procedures to address said issues. Due to the timing, and complexity of the reviewing and amending process, it will be impossible for CPL to have the amended procedures to you within the thirty (30) day requirement as stated in the subject NOA.

For your reference, I have enclosed a copy of your November 2, 2012 NOA letter to CPP regarding CPF 4-2012-5033M.

Should you have any questions, please contact me.

Sincerely,

Henry L. Leger
DOT Pipeline Safety Specialist

enclosure: Notice of Amendment - **CPF 4-2012-5033M**

ec: Gary Saenz - CPL

8.0 Emergency Operating Procedures

8.1 General

These Emergency Operating Procedures are provided to facilitate responding to emergencies that might occur at hazardous liquids pipeline facilities operated by the Company. These procedures are not intended to replace other related Company emergency response procedures.

8.2 Accident Reporting

8.2.1 Telephonic Notifications to Federal and/or State Pipeline Safety Agencies

1) Refer to the *Emergency Response Core Plan*, *Section 2 - Immediate Notifications* (302 KB), Page 6.
2) At the earliest practicable moment, but within 1 hour following confirmed discovery of an accident or incident resulting in a "Reportable" emergency event, as defined below, the Company Emergency Response Specialist/Designee must give telephonic notification to appropriate federal and state pipeline safety agencies.
3) A "Reportable Accident" is one that meets any of the following reporting criteria:
   - Causes the death or a personal injury requiring hospitalization
   - Resulted in a fire or explosion not intentionally set by the Company
   - Causes estimated property damage (including cost of conducting investigation, recovering and analyzing damaged pipe, cleanup, and recovery), value of lost product and damage to property of Company or others (or both) exceeding $50,000
   - Results in pollution of any stream, lake, reservoir, or other similar body of water that violated the applicable water quality standards, caused a discoloration of the surface of the water or adjoining shoreline, or deposited a sludge or emulsion beneath the surface of the water or upon the adjoining shoreline
   - In the judgment of the Company, it was significant – even though it did not meet the above listed criteria
4) All reasonable attempts must be made to perform telephonic notifications to appropriate federal and state pipeline safety agencies within two hours of discovery of the emergency event.
5) Accidents on state jurisdictional pipelines must be reported to state pipeline safety agencies, in addition to making telephonic notification to the National Response Center.
6) Telephonic notifications to the National Response Center and state pipeline safety agencies must include the following information:
   - Name and address of the operator (refer to appendices for proper operator and operator Federal ID Number)
   - Name and telephone number of the reporter
   - The location of the accident
   - The time of the accident

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- The fatalities and personal injuries, if any
- The initial estimate of amount of product released. Refer to Section 9 of the CPL Core Emergency Response Plan for methods of estimating spill volume.
- All other significant facts known by the operator that is relevant to the cause of the accident or extent of the damages

Provide an additional telephonic report to the NRC if significant new information becomes available during the emergency response phase of a reported event at the earliest practicable moment after such additional information becomes known.

7) Telephonic notification telephone numbers are as follows:

National Response Center: 1-800-424-8802 or electronically at *http://www.nrc.uscg.mil.*

- For notification to states, refer to the State Appendix of the *Emergency Response Manual*.

8.2.2 Unreporting Telephonic Notifications

If a telephonically reported accident to the NRC (DOT–OPS/EPA/Coast Guard) and/or appropriate State Pipeline Safety agency is determined to not meet the reporting criteria; then the appropriate Company DOT Pipeline Safety Specialist must submit a letter of rescission (unreport) within 30 days of the initial telephonic report to the following:

- The DOT (U.S. Department of Transportation) and PHMSA; and
- Where applicable, the appropriate State Pipeline Safety section.

A clear reference must be made to the date, subject, and NRC accident number of the initial telephonic notice.

8.2.3 Written Emergency Event (Accident) Reports

Per *195.50*, an accident report is required for each failure in a pipeline system in which there is a release of the hazardous liquid or carbon dioxide transported resulting in any of the following:

- Explosion or fire not intentionally set by the operator.
- Release of 5 gallons (19 liters) or more of hazardous liquid or carbon dioxide, except that no report is required for a release of less than 5 barrels (0.8 cubic meters) resulting from a pipeline maintenance activity if the release is the following:
  - Not otherwise reportable under this section.
  - Not one described in ¶*195.52(a)(4).*
  - Confined to company property or pipeline right-of-way.
  - Cleaned up promptly.
  - Death of any person.
  - Personal injury necessitating hospitalization.
  - Estimated property damage, including cost of clean-up and recovery, value of lost product, and damage to the property of the operator or others, or both, exceeding $50,000.

Appendix V contains the details for filing a written accident report.

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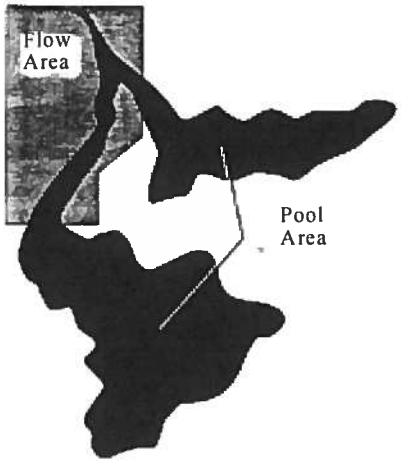
ESTIMATING SPILL VOLUME

SECTION 9 ESTIMATING SPILL VOLUME

ESTIMATING SPILL VOLUME

Oil spills on land are often as difficult to size as those offshore. A reasonably close estimate can be obtained by determining the area covered, average depth and average penetration into the soil. This process should be completed within 4 hours of discovery or, if daylight is necessary, within 3 hours after sunrise.



Classifying the Areas

The surface of spilled oil is usually so irregular that it is extremely difficult to estimate the area covered. The problem can be simplified if the spill area is first separately divided into two main types of areas:

- Flow Areas: Area coated by oil flow with little or no penetration.
- Pooling Areas: Area where oil has pooled after flowing, allowing penetration to occur.

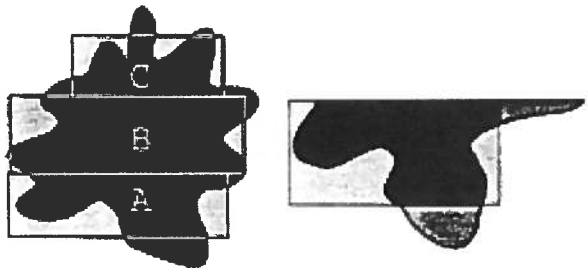
If the pool of oil has water underneath, the depth of oil should be reduced accordingly.

Converting Irregular Shapes (Simpson's Rule)

In order to estimate the area of an irregular shape, the shapes can be converted into a series of rectangles that approximate the area of the irregular shape, with about the same amount of spill area outside of the rectangle as there is dry area inside the rectangle. This can be done by stretching a steel tape along the ground outside the spill area. The area can then be quickly estimated by multiplying the length of the sides.

Area "A" 70' x 20' = 1400 square feet
Area "B" 60' x 10' = 600 square feet
Area "C" 35' x 20' = 700 square feet 2700 square feet total

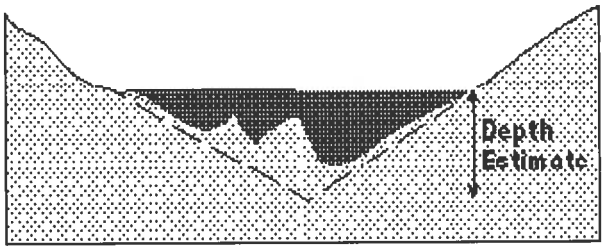
The more rectangles you use, the more accurate your estimate becomes.



Estimating The Average Depth

The next task is to estimate the average depth of oil in each of the areas. The oil will vary from very shallow at the edge to whatever depth the terrain is at the lowest point. This can be determined by "gauging" with a stick if it is shallow or accessible. If the pool is wider, you can heave a large stone into the pool to confirm depth. A good estimate can usually be made by observing the slope of the ground around the pool and assuming that the slope continues under the surface of the oil.

If you estimate that the deepest point in Area "A" is 20" and Area "A" has three boundaries of "shore", divide the depth figure by three to obtain average depth. If it has two "shore" boundaries, like Area "B", divide the depth by two to obtain average area depth.



Obtaining the Free Oil Volume

The irregular shaped area with unseen bottom has now been reduced to a familiar shape. The volume of free oil in Area "A" is:

Area "A": 70' x 20' = 1400 square Feet
Average depth = 20" " 3 – 7"
7 inches " 12 inches per foot = 0.6 foot
Area "A" Volume = 1400 square feet x 0.6 ft
Area "A" Volume – 840 cubic feet
The total volume would be the sum of Areas "A", "B", &"C".

Converting to Gallons and Barrels

Each cubic foot is equivalent to 7.5 gallons.
840 cu. ft. x 7.5 gallons/cubic ft. = 6300 gal
Each U.S. Barrel is 42 gallons:
6300 42 gallons/barrel = 150 barrels of oil.

Considering Penetration

Determining how much additional oil has penetrated into the soil can be accurately measured by taking a core sample of the oil covered soil, however, the following rule should suffice for estimates of oil spilled.

For penetration allowance in normal sand or soil, add 5% to the total volume for every foot of average depth. In the case of Area "A", the average depth was 7 inches, or 0.6 foot, so we add 3%.

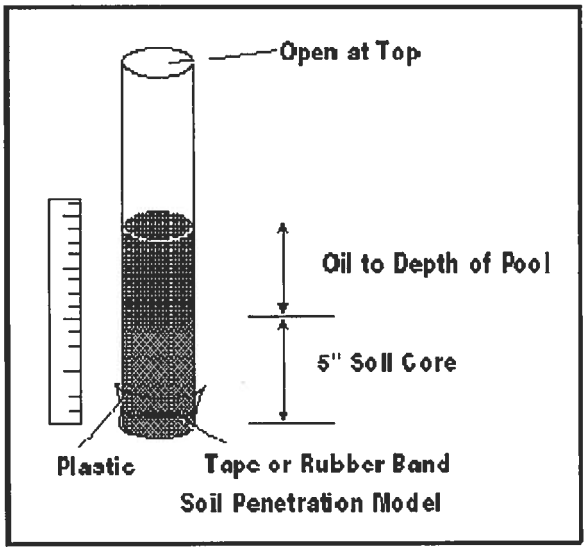
150 barrels x 1.03 = 154.5
6300 gallons x 1.03 = 6489 gallons

- Do not add a penetration allowance to areas with slopes that allowed a reasonable flow rate
- Add an allowance for slow flowing areas
- Reduce allowance by half if area is wet from rain

This is a method of estimating the volume of oil in the penetration. In the case above, the oil would penetrate 3" to 6" into the soil.

Precise Penetration Determination

If more precise determination is required, drive a clear plastic tube about 2" or larger in diameter 6" into the uncontaminated soil adjacent to the spill. Twist and remove with soil core. Seal the bottom of the tube with plastic and tape. Pour free oil into the top of the tube to the depth of the oil in the pool, mark the level and let it set for one hour. Measure how much the oil level has dropped. Observe how deep the oil has penetrated. Retain the model to observe increased penetration with time.



Soil Penetration Model

Walk Around Method

If the pool of oil is roughly circular, you can estimate its area by pacing around the pool and counting your paces. Walk as closely to the pool edge as possible. Try to make your paces three feet, or one yard long. If you counted 700 paces, the circumference is 700 paces x 3 ft/pace or 2100 feet. The next step is to guess how much smaller the actual pool is, compared to the circle you walked. If you were pretty close, deduct 10%.

2100 ft x .90 = 1890 ft adjusted circumference.
The diameter (d) of a circle is related to the circumference by the formula:
C = PI d (where; = 3.14)
If the circumference of our circle is 1890 ft., then the diameter is d=1890/PI = 1890/3.14 = 602' and the radius is 1/2 d = 602/2 = 301'
The area of the pool is given by the formula:

$$\text{Area} = \text{PI } r^2$$
$$A = 3.14 \times 301 \times 301$$
$$= 284{,}487 \text{ sq. ft.}$$

Now you can estimate the average depth by guessing the maximum depth. If we guess the depth from the exposed slope to be 12" at the deepest part, we can divide by four (four sloping sides) to estimate an average depth of 3" or 0.25 feet. The volume is therefore:

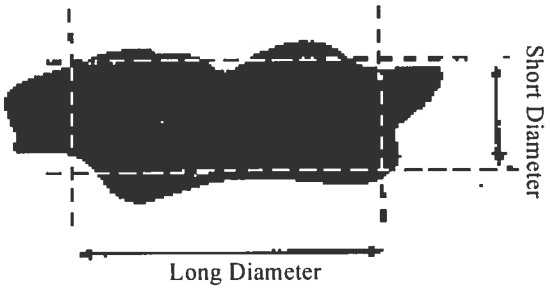
V = 284,487 sq. ft. x .25 feet – 71,122 cubic ft As before, we know each cubic foot contains ~ 7.5 gallons, therefore 71,122 cu. ft./7.5 gallons/cu ft. = 9,483 gallons

To convert to barrels = 9483 gallons/42 gallons/barrel = 226 barrels.

Our average depth was 3" so we can add about one percent for penetration = 226 x 1.01 = 228 barrels.

Average Diameters

You can also estimate the area of an oval shaped pool by pacing off (3' per step) the width of the "short diameter" and the "long diameter" and averaging them.



First pace off the "short diameter", but stop short to allow for the irregular shape. Repeat the procedure for the "long diameter". Add them together and divide by two to get the "average diameter".

In this example, the "short diameter" was 75 paces or 75 x 3 = 225 feet. The "long diameter" was 120 paces, or 360 feet.

The Average Diameter = (225+360)/2 = 292 feet and, the radius is 1/2 the diameter = 292/2 = 146 feet.
$A = PI\ r^2 = (3.14)\ (146)\ (146) - 66932$ sq. ft.
The average depth is 3" or .25 feet
The volume is: V = 66,932 sq. ft. x .25 ft. = 16,733 cu. ft.
For Gallons: 16,733/7.5 = 2,231 gallons
For Barrels: 2,231/42 = 53 barrels

Comparison Methods

Sometimes you can estimate area by comparing it to familiar areas, with adjustment for irregular shape. The following table gives the square footage of several familiar areas.

Type	Length	Width	Area
Football field	100 yds	50 yds	5,000 sq. yds.
Basketball court	94 ft.	50 ft.	3,700 sq. ft.
Tennis court	78 ft.	36 ft.	648 sq. ft.
Baseball diamond	90 ft.	90 ft.	810 sq. ft.
Parking space	20 ft.	10 ft.	200 sq. ft.
Office	10 ft.	10 ft.	100 sq. ft.
Service station	700 ft.	250 ft.	175,000 sq. ft.
4-lane intersection	55 ft.	55 ft.	3,025 sq. ft.

Inaccuracies In Estimates

All examples presented offer quick methods of estimating for gross volumes and are generally accurate within 20%, if your assumptions and measuring was accurate within 20%. These accuracies should be sufficient for initial reporting and determining resource requirements. Drills have indicated that all of the estimates generally are within 10% of the others.

Estimating Spill Volume on Water

Purpose

In the event of a sizable spill, a rough estimate of the spill's total volume provides the Incident Commander with preliminary data to plan and initiate the cleanup response. Generating this estimate early in the spill response aids in determining:

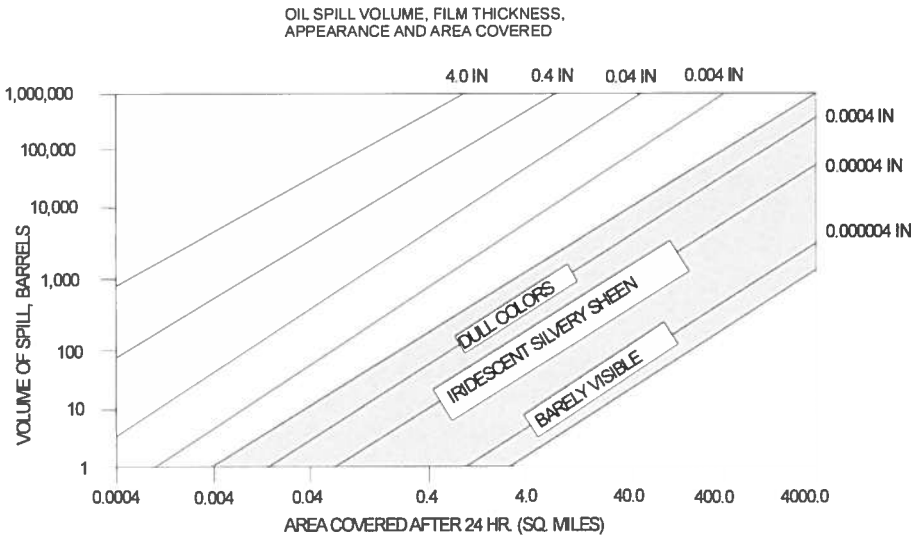
- the equipment and personnel needed
- the amount of oil that may reach shorelines and/or sensitive areas
- the requirements for temporary storage and disposal of recovered materials

This process should be completed within 4 hours of discovery, or if daylight is necessary, within 3 hours of sunrise.

Estimating By Observation

When conditions permit, direct measurements of spill parameters are preferred over visual estimates.

A rough estimate of spill volume can be generated from observations of the oil slick's size and thickness as demonstrated by the following figures.



Since oil slick spreading is influenced by the spill volume as well as physical forces, stopping the spill at it's source is critical in controlling the spread of a slick on water. The more conservative the first estimate of the spill volume, the better the chances that response forces will arrive at the spill site prepared with adequate and appropriate equipment. It is preferable to over respond early to a spill, rather than to under respond and risk un-preparedness. To under respond will impede the effectiveness of spill control and cleanup efforts. A slow or poorly prepared initial response can incur more operational costs and increase the risk of damage to marine and shoreline resources and environments. Therefore, properly planning the initial response is critical in a spill situation.

If a release of any type of oil occurs in an urban area, there is a high probability that the oil can enter a municipal storm drain system. If the oil is found to be entering the storm drain system from a curb drain inlet or street drain inlet, block the inlets. Construct sandbag dams in the street to restrict the oil from spreading and to reduce the area that will be required to be cleaned up.

If the oil has already entered the storm drain, remove the closest storm drain manhole cover and determine the flow direction of the system. If the released oil is flowing in the storm drain, continue reconnaissance of the manholes down stream of the release until there is not a show of oil. At this point, dam the storm drain on the down stream side with absorbent material to stop further migration and begin removal of the oil with a vacuum truck. Flush the drain with water beginning at the point the oil entered the system. Continue to flush the drain and recover the oily water until there is no longer a sheen of oil on the water. As disposal of oily material creates additional problems, flush the drain with the minimum amount of water needed to ensure recovery.

ESTIMATING SPILL VOLUME BY COLOR AND COVERAGE AREA

Estimating Spill Volume by Color and Coverage

Silvery Sheen					
Width X Length (feet)	Sq. Ft	Thickness (feet)	Cu. Ft.	Gal. Per Cu. Ft.	Gallons Spilled
100 X 500	50,000	0.00000025	0.0125	7.48	0.1
100 X 1,000	100,000	0.00000025	0.0250	7.48	0.2
100 X 2,000	200,000	0.00000025	0.0500	7.48	0.4
200 X 1,000	200,000	0.00000025	0.0500	7.48	0.4
500 X 1,000	500,000	0.00000025	0.1250	7.48	0.9
200 X 2,000	400,000	0.00000025	0.1000	7.48	0.7
200 X 5,000	1,000,000	0.00000025	0.2500	7.48	1.9
500 X 5,000	2,500,000	0.00000025	0.6250	7.48	4.7
500 X 10,000	5,000,000	0.00000025	1.2500	7.48	9.4

Bright Bands of Color (Purple, Blue to Green)					
Width X Length (feet)	Sq. Ft.	Thickness (feet)	Cu. Ft.	Gal. Per Cu. Ft.	Gallons Spilled
100 X 500	50,000	0.000001	0.0500	7.48	0.4
100 X 1,000	100,000	0.000001	0.1000	7.48	0.7
100 X 2,000	200,000	0.000001	0.2000	7.48	1.5
200 X 1,000	200,000	0.000001	0.2000	7.48	1.5
500 X 1,000	500,000	0.000001	0.5000	7.48	3.7
200 X 2,000	400,000	0.000001	0.4000	7.48	3.0
200 X 5,000	1,000,000	0.000001	1.0000	7.48	7.5
500 X 5,000	2,500,000	0.000001	2.5000	7.48	18.7
500 X 10,000	5,000,000	0.000001	5.0000	7.48	37.4

Trace of Color (Yellow, Bronze, Violet)					
Width X Length (feet)	Sq. Ft.	Thickness (feet)	Cu. Ft.	Gal. Per Cu. Ft	Gallons Spilled
100 x 500	50,000	0.0000005	00.250	7.48	0.2
100 x 1,000	100,000	0.0000005	0.0500	7.48	0.4
100 x 2,000	200,000	0.0000005	0.1000	7.48	0.7
200 x 1,000	200,000	0.0000005	0.1000	7.48	0.7
500 x 1,000	500,000	0.0000005	0.2500	7.48	1.9
200 x 2,000	400,000	0.0000005	0.2000	7.48	1.5
200 x 5,000	1,000,000	0.0000005	0.5000	7.48	3.7
500 x 5,000	2,500,000	0.0000005	1.2500	7.48	9.4
500 x 10,000	5,000,000	0.0000005	2.5000	7.48	18.7

Colors Turning Dull (Brick Red, Turquoise, Pale Yellow)					
Width X Length (feet)	Sq. Ft.	Thicknes (feet)	Cu. Ft.	Gal. per Cu. Ft.	Gallons Spilled
100 x 500	50,000	0.0000033	0.1650	7.48	1.2
100 x 1,000	100,000	0.0000033	0.3300	7.48	2.5
100 x 2,000	200,000	0.0000033	0.6600	7.48	4.9
200 x 1,000	200,000	0.0000033	0.6600	7.48	4.9
500 x 1,000	500,000	0.0000033	1.6500	7.48	12.3
200 x 2,000	400,000	0.0000033	1.3200	7.48	9.9
200 x 5,000	1,000,000	0.0000033	3.3000	7.48	24.7
500 x 5,000	2,500,000	0.0000033	8.2500	7.48	61.7
500 x 10,000	5,000,000	0.0000033	16.500	7.48	123.4

PIPE REPAIR

PROCEDURE NUMBER: MIP-403

Approved January 2013

5.6 Pipe Preparation

5.6.1 Support the pipe to prevent movement during installation. Remove as little dirt as possible underneath the pipe and use sandbags or skids to minimize stress concentration.

5.6.2 Remove all coating from the section of pipe to be repaired. Sandblast or wire brush the external surface of the pipe to remove dirt, rust, scale, and other foreign materials. In addition, at each end of the sleeve-to-pipe connection, machine buff at least 3" on each side of the connection.

NOTE: ***If the coating contains asbestos, follow the Safe Handling of Asbestos Containing Material procedure (HES-703).***

WARNING: ***Grinding must not be used to clean the pipe or sleeve.***

5.7 Patch Installation

Although welded patches are an industry accepted method for repairing certain pipelines and have been used for repairing Company pipelines in the past, this method is not recommended for Company pipeline repairs today or in the future. Existing patch repairs may be acceptable only if they meet all current regulatory specifications and applications

5.8 Mechanical Applied Full Encirclement Sleeves

5.8.1 A mechanical applied full encirclement sleeve is a sleeve manufactured with matching halves and sealing elements for both longitudinal and circumferential sealing of the pipe. It has stud bolts and nuts for installation onto the pipeline. In most cases, mechanical applied full encirclement sleeves used for permanent repairs must be welded to the pipe. On offshore crude oil pipelines, non-welded Plidco-type clamps are allowed as permanent repairs where they eliminate the need for lifting the pipeline to the surface. However, welded sleeves are still the preferred method for repair.

Mechanical applied full encirclement sleeves do not need to be welded for the following:

a) Temporary repairs

b) DOT 49 CFR Part 192 regulated gas transmission pipelines which are:
   - submerged offshore pipelines; or
   - submerged pipelines in inland navigable waters when the encirclement sleeve meets the design requirements of the pipeline for which it is installed

c) DOT 49 CFR Part195 regulated submerged offshore crude oil pipelines when the encirclement sleeve meets the design requirements of the pipeline for which it is installed

5.8.2 Prepare the pipe as described in Section 5.6 Pipe Preparation of this procedure.

5.8.3 Coat all exposed surfaces of the gasket with a lubricant that is compatible with the seal and product.

5.8.4 Clean and lubricate all studs and nuts, and prove the nut is free, and turns easy prior to the installation.

5.8.5 Assemble the sleeve loosely around the pipeline to one side of the pipeline defect, matching the mating identified ends recommended by the manufacturer. Slide the sleeve over the defect, being careful not to damage the girdering and packing. Center the sleeve over the pipeline defect. Hand tighten the studs and nuts.

5.8.6 All studs and nuts should be uniformly torqued as recommended by the sleeve manufacturer. Maintain an equal gap between side bars while tightening the bolts.

5.8.7 Complete assembly by rechecking tightness of all the studs to the manufacturer's torque recommendations.

5.8.8 Depending on the manufacturer, the side bars are generally gapped approximately $^{1}/_{8}$" when the sleeve is fully tightened.

5.8.9 After the mechanical sleeve has been installed and the pipeline has been re-pressured, check the sleeve to assure there are no leaks. Use soap or a combustible gas indicator (CGI) for testing. If leaks are detected, return to step 5.8.7 above.

If the sleeve will be welded to the pipe, complete the following steps:

1) Reduce the pressure by a third of the normal operating pressure to allow the sleeve to share hoop stress. In cases where the product or operation does not allow the pressure to be dropped by a third, consult the PS&S Technology Team's Pipeline Integrity Technologist or Engineer, or Asset Management's Field Engineer before continuing.

WARNING: Product flow must be maintained to permit cooling and prevent the build-up of gases.

2) After the pressure is reduced, complete final tightening of the sleeves. The gap of the longitudinal weld groove is critical. The gap must be $^{1}/_{16}$" on each side. Reposition the sleeve or grind the edges to achieve the proper gap.

3) Weld the sleeve per the Pipe Welding procedure (MIP-407) and the sleeve manufacturer's recommendation.

The sleeve installation welding procedure is a low hydrogen API-1107 process. Use absolutely dry low hydrogen electrodes and carefully control the size and shape of the circumferential fillet weld. The leg length of the fillet weld should not be less than the wall thickness of the pipe. Strive for a concave faced fillet weld, with streamlined blending into both members; avoid notches and undercuts. The smoother and more streamlined the weld, the greater the resistance to fatigue.

NOTE: ***The worst possible shape would be a heavy reinforced convex weld with an undercut.***

4) If sleeve manufacture does not provide detailed welding guidelines, welding should proceed slowly and caution should be observed so the welding does not overheat the packing and sealing elements. Sequence the welding so that the heat is not concentrated in one area.

5) Fillet-weld the sleeve ends to pipe.

6) Seal-weld the sleeve side openings.

7) Re-torque the studs and nuts.

8) Seal-weld around the bottoms of the nuts to the side bars.

9) Seal-weld the nuts to the studs (see the manufacturer's material list for ASTM metal composition of studs and bolts).

WARNING: ***Product flow must be maintained to permit cooling and prevent the build-up of gasses.***

10) Inspect the welded sleeve per MIP-407.

5.8.10 Sleeve and adjoining bare pipe must be coated using an approved coating material prior to backfill. See MIP-503 for coating procedures.

5.9 Full Encirclement Sleeve (Full Wrap)

5.9.1 A full encirclement sleeve (full wrap) is a metal wrap installed around pipe for reinforcement and containing pressure. The full sleeve is produced by welding together two half sleeves around pipe. Sleeves are only permitted to be installed on pipe having a wall thickness between .188 and .750 inches.

There are two types of full wrap encirclement sleeves:

- Type A is longitudinally welded along its connecting edges but not welded to the pipe at the ends.
- Type B is welded on the ends to the carrier pipe in addition to the longitudinal weld. Type B is the recommended installation because it is pressure containing. Type B sleeves include coupling or "pumpkin" sleeves

designed to reinforce or upgrade older coupled lines, weld+ends, patches or girth welds.

NOTE: ***Consult the PS&S Technology Team's Pipeline Integrity Technologist or Engineer or Asset Management's Field Engineer before using Type A sleeves. An MOC deviation request will need to be implemented if a Type A is selected.***

Sleeve material is listed in the Pipe Welding procedure (MIP-407) by pipe material/sleeve material classification. See Section 5.9.10 and Section 5.9.11 for girth weld and long repair lengths. For assistance, contact the PS&S Technology Team's Pipeline Integrity Technologist or Engineer or Asset Management's Field Engineer.

5.9.2 The sleeve material wall thickness must be calculated to accommodate the full design pressure of the mainline pipe on which it is installed. Use the following formula:

$$T_s = \frac{T_p S_p D_p}{D_p S_s - 2 S_p T_p}$$

Where:

T_s= Minimum sleeve thickness in inches (at full design pressure)

T_p= Minimum pipe thickness in inches (at full design pressure)

S_s= SMYS for the sleeve material in psi

S_p= SMYS for the pipe material in psi

D_p= Outside diameter of the pipe in inches

The sleeve thickness must be greater than or equal to the pipe wall thickness. Sleeve material of higher SMYS than the pipeline must have a wall thickness equal to or greater than the original pipeline design thickness. No credit must be taken for the increased SMYS of the sleeve. If the sleeve thickness is greater than the pipe thickness, the ends of the sleeve must be chamfered at a 45-degree angle to a thickness equal to the pipe.

5.9.3 Inspect the wall thickness.

The integrity of the pipe at the fillet weld location must be verified. This may be done using an ultrasonic thickness gage and by visual inspection.

The minimum pipe wall thickness at the location where the sleeve will be welded to the pipe is .188".

5.9.4 Prepare the pipe as described in Section 5.6 Pipe Preparation of this procedure.

5.9.5 Prepare the sleeve and fit it to the pipe.

a) Wire brush the internal surface of the sleeve to remove dirt, rust, scale, and other foreign materials.

WARNING: Grinding must not be used to clean the pipe or sleeve.

b) A factory manufactured half sleeve is usually 10' long and may be cut to the required length in the field. The minimum length for a sleeve is four (4) inches per DOT. However, Chevron Pipe Line recommends no sleeve must be less than 12" long. See Section 5.9.11 for options if multiple sleeves are needed to due to repair length or for wrapping extra metal such as existing patches and weld+ends.

c) Bevel the sides for butt welding and plane cut the ends for fillet welding. If any adjustments are made to the half sleeve, the sides must be re-beveled and the ends planed.

d) A backing strip is recommended at the longitudinal butt weld to protect the pipe from weld damage. The strip must be a minimum of 16 gauge (.0625" thick) mild carbon steel cut to the length of the half sleeve. Tack weld the strips to the bottom half of each side, with welds approximately ½" long and spaced 24" apart. Follow the sleeve manufacturer's instructions, if available.

e) When sleeves are used to repair dents, fill the dent with a hardening filler material such as epoxy or automobile body putty before installing the sleeve.

f) Place the bottom sleeve, with the backing strips attached, under the pipe with the edges of the strip barely touching the sides of the pipe. Position the top sleeve over the pipe using wedges on the ends of the top sleeve's longitudinal seam to provide clearance for the backing strip to fit underneath the top half.

g) Plate clamps can be used for positioning the top sleeve and can be removed when the proper position is obtained. Spreader bar rigging may be used when handling long half sole sleeve sections.

h) Once the half sole sleeves are in close proximity to the pipe, position the chain clamps around the half sole. Chain clamps should be fabricated of a diamond, double roller type chain, although other clamp devices such as single roller chain or U-bolts for small diameters may work as well. The tightening mechanism must be supported by a metal shoe contoured to the shape of the half sole/pipe.

i) Tighten the clamps at an equal rate on each clamp until the top half sole has cleared the backing strips. At this point, the wedges can be removed. Continue tightening the clamps until the half sole is firmly in position.

WARNING: ***Before tightening the half sole for the final time and welding the longitudinal seams, the pipeline pressure must be reduced to assure the gap between the pipe and sleeve is at a minimum and the sleeves are load bearing.***

j) Remove any hydrocarbon film on the sleeve and pipe at the fillet weld location with a suitable solvent. **This is an important step and integral to ensuring a low-hydrogen weld.**

5.9.6 Reduce the pressure by one third of the normal operating pressure to allow the sleeve to share hoop stress. In cases where the product or operation does not allow the pressure to be dropped by a third, consult the PS&S Technology Team's Pipeline Integrity Technologist or Engineer, or Asset Management's Field Engineer before continuing.

WARNING: ***Product flow must be maintained to permit cooling and prevent the build-up of gasses.***

5.9.7 After the pressure is reduced, complete final tightening of the sleeves.

The gap of the longitudinal weld groove is critical. The gap must be 1/16" on each side. Reposition the sleeve or grind the edges to achieve the proper gap.

5.9.8 Weld the sleeve per the Pipe Welding procedure (MIP-407).

The sleeve installation welding procedure is a low hydrogen API-1107 process. Use absolutely dry low hydrogen electrodes and carefully control the size and shape of the circumferential fillet weld. The leg of the fillet weld should equal 1.4 times the wall thickness of the pipe. Strive for a concave faced fillet weld, with streamlined blending into both members; avoid notches and undercuts. The smoother and more streamlined the weld, the greater the resistance to fatigue. The longitudinal welds must be completed before welding circumferentially type "B" full encirclement sleeves.

NOTE: ***The worst possible shape would be a heavy reinforced convex weld with an undercut.***

WARNING: ***Product flow must be maintained to permit cooling and prevent the build-up of gasses.***

5.9.9 Inspect the welds on the installed sleeve per MIP-407.

5.9.10 Sleeve and adjoining bare pipe must be coated using an approved coating material prior to backfill. See MIP-503 for coating procedures.

5.9.11 Guidance for installing multiple sleeves or wrapping exra metal such as patches and weld+ends:

a) If the area to be sleeved contains a girth weld that may provide difficulty with fitting a plain sleeve, an expanded sleeve (sometimes called a weld wrap) can be installed providing the material meets the requirements listed in MIP-407. This expanded sleeve may be butt welded to another sleeve or sleeves if additional coverage is needed.

b) If the area to be sleeved is longer than the sleeve material and additional pieces must be used, use one of the following methods.

- Butt weld the sleeves together at each end and radiographically inspect the butt welds prior to installing the sleeve halves on the pipeline

- Leave a gap between adjacent sleeves. Per ASME B31.4 for liquid lines, the distance between sleeves should be at least one pipe diameter. This distance is not mentioned in ASME B31.8 for gas lines so use CPL's earlier guidance which is "leave a minimum of ½ pipe diameters (or 4" minimum) between the two (2) sleeves"
- Butt the sleeves together and install another sleeve over those using the proper sleeve weld procedure listed in MIP-407. The overlapping sleeve must be at least 12" long and centered over the primary sleeve ends. The overlapping sleeve must be oversized (larger inside diameter) and be able to cover the entire circumference of the primary sleeve. The overlapping sleeve material and thickness must be calculated using the larger outside diameter of the primary sleeves.

c) For coupling or "pumpkin sleeves", fill the sleeve with hardening pourable putty or epoxy filler material through one vent opening until it flows out the other. Approved materials include Bio-seal 197 Epoxy.

Consult the Technology Team Metallurgy Engineer or Pipeline Integrity Technologist for more information.

For installation procedures and details, see Appendix E – Pumpkin Sleeve Installation

5.10 Composite Sleeve Repair

5.10.1 A composite sleeve repair is a full-encirclement fiberglass composite wrap installed around the pipe using multiple layers. One of the most well-known composite sleeve repairs is called "Clock Spring®." The sleeve is manufactured from high tensile strength corrosion resistant fiberglass with a filler material. This type of repair is produced by wrapping the product around the pipe and attaching it to the pipe and itself with an adhesive. At this time, "Clock Spring", "AquaWrap" and Walker Technical TechnoWrap 2K are the only composite repair sleeve approved for use by Company. (Walker wrap is supplied by Techno-Pipe in Covington, LA.)

5.10.2 Composite sleeves are permitted:

- For repairing external metal loss defects (except for locations with metal loss of 80% of pipe wall thickness or greater)
- For repairing external metal loss in bends with a radius of 3-D or greater (custom repair)
- For repairing external metal loss at girth welds (except for locations with metal loss of 50% of pipe wall thickness or greater or a width of 30% of circumference or greater)
- For repairing plain dents (unless cracks are evident). Visual inspection and either magnetic particle or dye penetrant testing should be used to look for cracking. Dents with cracking or stress concentrators, such as gouging, grooving or metal loss, cannot be repaired with a composite sleeve.
- For repairing 4" through 56" diameter pipe (with a minimum wall thickness of .068")

Composite sleeves are not permitted:

- For repairing leaking pipe.
- For repairing internal corrosion.
- For leak prevention from through-wall internal pitting.
- For repairing dents in bends and dents with cracking or stress concentrators, such as gouging, grooving, or metal loss.
- For repairing linear crack-like defects such as stress corrosion cracking.
- For repairing defects with sharp edges.
- For repairing gouges.
- Where there is a concern of the pipe pulling apart.
- For repairing girth welds with crack-like defects.
- For repairing girth welds that fail code-required weld quality requirements.
- For repairing piping with a continuous operating temperature greater than 140° F or spiking temperature greater than 180° F (unless manufacturer has a product with a higher temperature adhesive and resin).
- For underwater applications.

Composite sleeves should be:

- Installed per manufacturer’s guidelines.
- Installed by qualified personnel trained and certified by the specific composite sleeve’s manufacturer or a trainer certified by the manufacturer. The installation of composite sleeves is a covered task under the Operator

Qualification Rule (Task 40.3). Company personnel may train and qualify additional installers if they have been specifically trained and certified as a trainer by the composite repair kit manufacturer. Installers must re-certify annually by written test per the sleeve manufacturer's guidelines. Installers who have not installed a composite sleeve within a 15-month period must be recertified by a qualified instructor by written test and by performing a sample installation.

NOTE: ***See Appendix C or consult the PS&S Technology Team's Pipeline Integrity Technologist or Engineer or Asset Management's Field Engineer for more clarification on the use of these sleeves.***

5.10.3 The sleeve design is established by the repair sleeve manufacturer. The proper number of wrap layers is also determined by the sleeve manufacturer. The length of sleeve varies from manufacturer to manufacturer, but Chevron Pipe Line recommends no repair sleeve must be less than 11½" long (length refers to length along the pipeline) except for bend repair and on each side of a girth weld repair.

NOTE: ***Only material supplied with a composite sleeve repair kit may be used. No substitutes are allowed. This includes dent filler also. Do not use auto body filler or Bondo®.***

5.10.4 Inspect the wall thickness. The integrity of the pipe at each end of the sleeve must be verified. This may be done using an ultrasonic thickness gage and by visual inspection.

The minimum pipe wall thickness at each end of the sleeve is .068". Extend or move the sleeve to assure that this minimum is maintained.

5.10.5 Prepare the pipe as described in Section 5.6 Pipe Preparation of this procedure. The pipe must be cleaned of all coating, oil, corrosion products, dirt or foreign material by sandblasting, wire brush, or scrapers. Coatings containing zinc or coal tar must be completely removed from the surface as they inhibit the curing and bonding properties of the composite's adhesive. The pipe must be bare, clean and dry and should meet the standard of a NACE 3 finish. An anchor pattern is required. Any sharp defects must be re-shaped to "blunt" condition.

Filler material should be applied to the metal loss area to restore the original pipe contour. This includes any longitudinal weld bead above the contour of the pipe and leading edge of the starter pad.

A slight excess of filler may be applied to the metal loss area to be repaired prior to installation of the repair sleeve.

When sleeves are used to repair dents, fill the dent with a hardening filler material provided by the composite sleeve manufacturer before installing the sleeve. A temporary sleeve will also be installed to assure that the contour of the dent and pipe are the same.