



# Rerate Assessment

<b>Client:</b>	Client	<b>Platform:</b>	Platform	<b>Equip No.:</b>	Flowline
<b>Equipment Description:</b>	Flowline			<b>CML No.:</b>	35.05
<b>System Pressure:</b>	1480			<b>Insp Date:</b>	2/15/2015
				<b>Design Code:</b>	B31.3

Data Input		B31.3 Process Piping $P=(2SEt)/(D-2tY)$		
1480	System Pressure	10yr forecast (.003 mil/yr FCA)		
0.003	Corrosion Rate	1118	psi	Current 2/15/2015
4.500	Outside Diameter	1090	psi	1yr 2/15/2016
0.337	Wall Thickness	1062	psi	2yr 2/15/2017
3.826	Inside Diameter	979	psi	5yr 2/15/2020
0.162	Required Thickness	841	psi	10yr 2/15/2025
	Pit Depth (B31G only)			
0.123	Last Thickness (FFS only)			
6.000	Corrosion Longitudinal Length			
2.000	Corrosion Circumferential Length			
20000	Allowable Stress			
35000	Yield Strength			
60000	Ultimate Tensile Strength			
	Design Factor (B31G only)			
1.00	Joint Efficiency (E)			
1.50	Lmsd			

**Unable to perform FFS due to (X):**  
 Thickness is less than .100"  
 LMSD is zero  
 Not enough information  
 Internal/External Corrosion Overlap

**Sect VIII div 1, B31.3 process piping**

**API 579 FFS Assessment**

1295	psi	Current	2/15/2015
1267	psi	1yr **10yr forecast	2/15/2016
1238	psi	2yr (.003 mil/yr FCA)	2/15/2017
1153	psi	5yr	2/15/2020
FAIL	psi	10yr	2/15/2025

**Circumferential  
Extent of Flaw**

ACCEPTABLE
ACCEPTABLE
ACCEPTABLE
ACCEPTABLE
ACCEPTABLE

**NOTES:**

B31.3 process piping; $P=(2*Ultimate\ Tensile\ Strength*Actual\ t)/(OD)$	
Burst Pressure	
OD:	4.5
Last Thickness:	0.123
Ultimate Tensile Strength:	60000
Burst Pressure:	3280
	3200
	3120
	2880
	2480

Current	2/15/2015
psi 1yr	2/15/2016
psi 2yr	2/15/2017
psi 5yr	2/15/2020
psi 10yr	2/15/2025

LEVEL 1 ASSESSMENT (PIT TYPE CORROSION ONLY)	
Item: Flowline	Platform: Platform
Description: Flowline	TML#: 35.05

**Step 1: Enter the following information:**

ID= 3.826 in.      FCA= 0.0000 : Current

$L_{msd}$ = 1.50 in.      MAWP= 1480 psi

RSF<sub>a</sub>= 0.9

**Step 2: Determine  $t_{min}$  of component**

Select Component: Pipe <--Drop Down

S= 20000 psi      ID/2+FCA: R<sub>c</sub>= 1.91 in. Current

1.92	: 1 yr
1.93	: 2 yr
1.93	: 5 yr
1.94	: 10 yr

E= 100% %      P= 1480 psi

Calculated Pressure  $t_{min}$ = 0.068746115 : not rounded off      0.069 : Rounded Up

OR

Structural or MIMS  $t_{min}$ = 0.162 in.      Override Pres.  $t_{min}$ = : Current

Tmin Used: 0.162 Current

Y= 0.4

**Step 3: Determine the Minimum Measured Thickness ( $t_{mm}$ )**

$t_{mm}$ = 0.123 in.      s = 6 in.

FCA= 0.0000 in. Current       $t_{min}$ = 0.162 in. Current

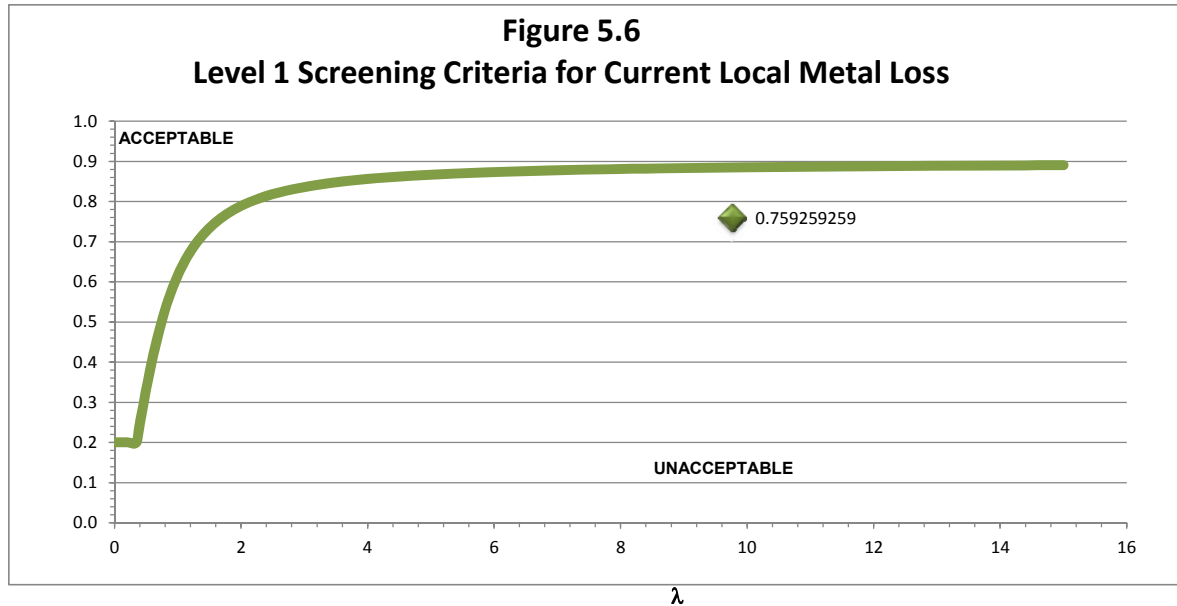
$R_t$  = 0.759259259 Current       $\lambda$  = 9.755088863 : Current

**Step 4: Evaluation of Flaw Size Criteria**

	Current	1 Year	2 Year	5 Year	10 Year
$R_t \geq 0.20$	TRUE	TRUE	TRUE	TRUE	TRUE
$t_{mm} - FCA \geq 0.10"$	TRUE	TRUE	TRUE	TRUE	FALSE
$L_{msd} \geq \sqrt{1.8 D t_{min}}$	TRUE	TRUE	TRUE	TRUE	TRUE

**Assessment**

Flaw size criteria acceptable for Current assessment continue to Step 5  
 Flaw size criteria acceptable for 1 Year assessment continue to Step 5  
 Flaw size criteria acceptable for 2 Year assessment continue to Step 5  
 Flaw size criteria acceptable for 5 Year assessment continue to Step 5  
 Lvl 1 FFS NOT applicable for 10 Year assessment !



## LEVEL 1 ASSESSMENT (PIT TYPE CORROSION ONLY)

### Step 5 Evaluation of Flaw Size Criteria

$$R_{\text{CURVE}} = 0.759259259 \text{ in. Current} \qquad R_t = 0.759259259 \text{ : Current}$$

If the point defined by the intersection of  $R_t$  and  $\lambda$  is on or above and to the left of the curve (Figure 5.6), then the longitudinal extent of the flaw is acceptable per Level 1. If the component is a cylindrical, conical shell or elbow, proceed to Step 7. Otherwise, the assessment is complete.

### Step 6: If the point in Table 5.7 is unacceptable, the component can be rerated using the following method:

#### MAWP

$$RSF = 0.787 \text{ in. Current}$$

$$RSF_a = 0.900 \text{ in.}$$

$$M_t = 6.832103936 \text{ in. Current}$$

$$R_t = 0.884828317 \text{ in. Current}$$

$$MAWP = 1480$$

$$MAWP_r = 1294.161646 \text{ : psi Current}$$

$$1266.154003 \text{ : psi 1 yr}$$

$$1237.988096 \text{ : psi 2 yr}$$

$$1152.527255 \text{ : psi 5 yr}$$

$$1006.798598 \text{ : psi 10 yr}$$

Rerate component equal to or less than MAWPr (1294.16164583778 psi)  
 Rerate component equal to or less than MAWPr (1266.15400338233 psi)  
 Rerate component equal to or less than MAWPr (1237.98809597853 psi)  
 Rerate component equal to or less than MAWPr (1152.52725459933 psi)  
 Rerate component equal to or less than MAWPr (1006.79859827336 psi)

### Step 7: For cylindrical and conical shells or elbows, evaluate the circumferential extent of the flaw using Figure 5.7. If the point defined by the intersection of these values is on or above the curve, then the circumferential extent of the flaw is acceptable.

$$c = 2.000 \text{ in.}$$

$$ID = 3.83 \text{ in.}$$

$$R_t = 0.759259259 \text{ in. Current}$$

$$c / D = 0.523 \text{ in.}$$

$$R_{\text{CURVE}} = 0.446802625$$

Current: Circumferential Extent of flaw is acceptable (See Figure 5.7).

1 yr: Circumferential Extent of flaw is acceptable (See Figure 5.7).

2 yr: Circumferential Extent of flaw is acceptable (See Figure 5.7).

5 yr: Circumferential Extent of flaw is acceptable (See Figure 5.7).

10 yr: Circumferential Extent of flaw is acceptable (See Figure 5.7).

**Figure 5.7**  
**Max. Allow Circumferential Extent of Current Local Metal Loss**

