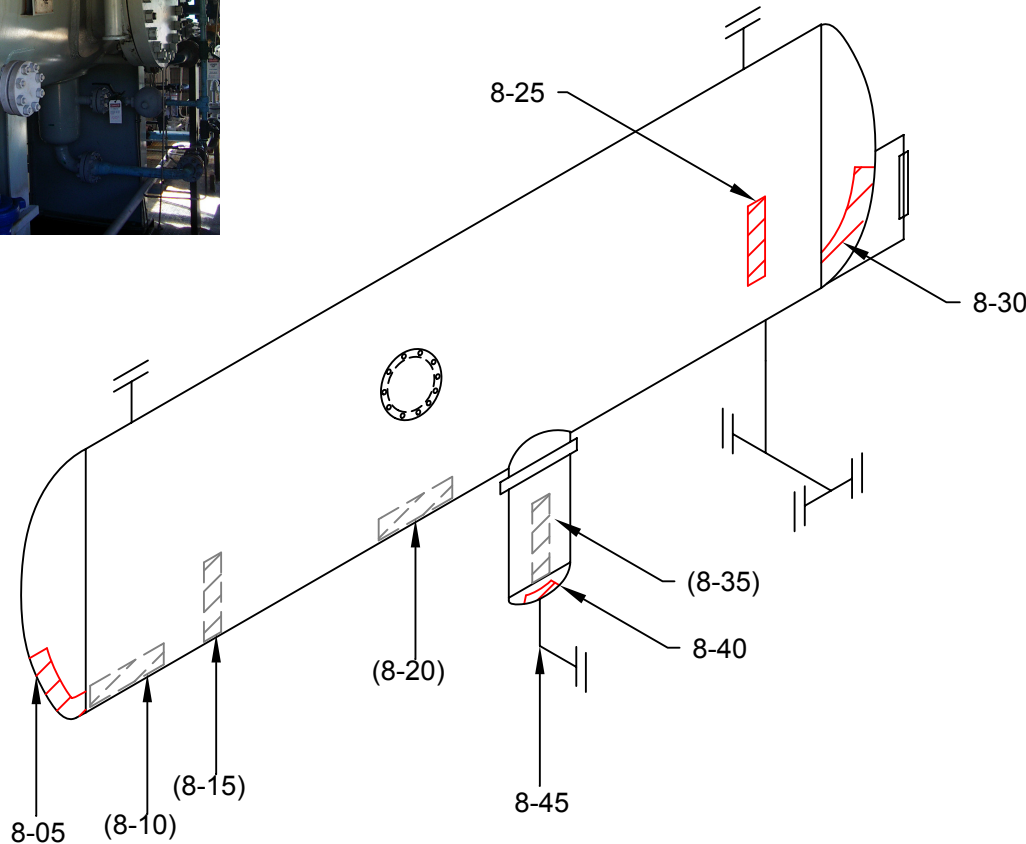


ITEM:

SEPARATOR

A 0228931



COMMENTS:

PROJECT:

C70099



STETTLER, AB (403) 742-4868
 LACOMBE, AB (403) 782-7855
 BROOKS, AB (403) 501-8029
 GRANDE PRAIRIE, AB (866) 422-9732

TECHNICIAN:

JOSHUA WALTERS
 SNT LEVEL II
 CGSB 48.9712
 LEVEL II # 15660

DATE: **01/27/11**

DWG # **8**

CLIENT: **CNRL**

LSD: **16-35-074-11-W6M**

INSPECTOR : RAJ KHAN

LOCATION : VALHALLA

DISTRICT UNIT : WEST COUNTY

BLDG/SKID : SKD 0175

PROCESS : SOUR

CODE : ASME SEC VIII DIV 1

SPECIFICATION : AS PER ASME SE 797

TECHNIQUE : UT 1-1, REV .1

METHOD : UT CONTINUOUS / A SCAN

SURFACE COND : PAINTED

SURFACE TEMP : AMBIENT

VESSEL INFORMATION

VESSEL # : **A 0228931**

CRN # : F9168.2

SERIAL # : FH.42.6.1355B

MANUFACTURER : OPSCO

DATE BUILT : 1987

CLIENT ID / TAG : -

M.A.W.P. : 638 PSI

M.A.W.T. : 350°F

JOINT EFFICIENCY/RT : RT 1

STRESS RELIEVED : YES

INSULATED : NO

MANWAY : YES

VESSEL SPECIFICATIONS

| | OD | NOMINAL | MATERIAL | CA |
|---------------------|--------|---------|------------|-------|
| VESSEL HEAD | 42" | .990" | SA-516-70 | .125" |
| VESSEL SHELL | 42" | 1.00" | SA-516-70 | .125" |
| BOOT HEAD | 10.75" | .593" | SA-234-WPB | .125" |
| BOOT SHELL | 10.75" | .593" | SA-106-B | .125" |



ULTRASONIC CORROSION SURVEY

Survey Name: CNRL

| | | | | |
|----------------------------|--------|-------------------------|---------------------------------|----------------------|
| LSD: 16-35-074-11W6 | Dwg: 8 | Vessel Number: A0228931 | Manufacturer: OPSCO | Survey Date: 1/27/11 |
| District Unit: WEST COUNTY | | Vessel Name: SEPARATOR | Serial Number: FH.42.6.1355B | Inspector: RAJ KHAN |
| Location: VALHALLA | | Year Built: 1987 | Shell MAWP PSI: 638 MAWT F: 350 | Process: SOUR |
| Skid: SKD0175 | | Tag Number: - | Tube MAWP PSI: 0 MAWT F: 0 | Project #: C70099 |
| | | CRN: F9168.2 | Vessel CA: 0.1250 | |

| Band | Description | | Readings | | | | | | Year | Avg Inches | Min Inches | Nominal | CA | TMIN | Recommended Next Inspection | Recommended Retirement Date | |
|----------|-------------|------------|----------|-------|-------|-------|-------|-------|-------|-------------|------------|---------|-------------|--------|-----------------------------|-----------------------------|------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | |
| 8-05 | Bottom | Head | Baseline | 0.988 | 0.995 | 1.002 | 1.004 | 1.017 | 1.021 | 2006 | 1.005 | 0.988 | 0.9900 | 0.1250 | 0.7322 | 2012 | 2031 |
| Shape | Ellipsoidal | Shell Side | Previous | 0.988 | 0.995 | 1.002 | 1.004 | 1.017 | 1.021 | 2006 | 1.005 | 0.988 | Comments--> | | | | |
| OD | 42 | | Current | 0.988 | 0.995 | 1.002 | 1.004 | 1.017 | 1.021 | 2011 | 1.005 | 0.988 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-10 | Lower | Shell | Baseline | 1.008 | 1.008 | 1.009 | 1.008 | 1.009 | 1.008 | 2006 | 1.008 | 1.008 | 1.0000 | 0.1250 | 0.7454 | 2012 | 2031 |
| Shape | Cylindrical | Shell Side | Previous | 1.008 | 1.008 | 1.009 | 1.008 | 1.009 | 1.008 | 2006 | 1.008 | 1.008 | Comments--> | | | | |
| OD | 42 | | Current | 1.008 | 1.008 | 1.009 | 1.008 | 1.009 | 1.008 | 2011 | 1.008 | 1.008 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-15 | Lower | Shell | Baseline | 1.011 | 1.010 | 1.002 | 0.984 | 1.008 | 1.007 | 2006 | 1.004 | 0.984 | 1.0000 | 0.1250 | 0.7454 | 2012 | 2031 |
| Shape | Cylindrical | Shell Side | Previous | 1.011 | 1.010 | 1.002 | 0.984 | 1.008 | 1.007 | 2006 | 1.004 | 0.984 | Comments--> | | | | |
| OD | 42 | | Current | 1.011 | 1.010 | 1.002 | 0.984 | 1.008 | 1.007 | 2011 | 1.004 | 0.984 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-20 | Lower | Shell | Baseline | 1.010 | 1.008 | 1.011 | 1.010 | 1.008 | 1.007 | 2006 | 1.009 | 1.007 | 1.0000 | 0.1250 | 0.7454 | 2012 | 2031 |
| Shape | Cylindrical | Shell Side | Previous | 1.010 | 1.008 | 1.011 | 1.010 | 1.008 | 1.007 | 2006 | 1.009 | 1.007 | Comments--> | | | | |
| OD | 42 | | Current | 1.010 | 1.008 | 1.011 | 1.010 | 1.008 | 1.007 | 2011 | 1.009 | 1.007 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |



ULTRASONIC CORROSION SURVEY

Survey Name: CNRL

| | | | | |
|----------------------------|--------|-------------------------|---------------------------------|----------------------|
| LSD: 16-35-074-11W6 | Dwg: 8 | Vessel Number: A0228931 | Manufacturer: OPSCO | Survey Date: 1/27/11 |
| District Unit: WEST COUNTY | | Vessel Name: SEPARATOR | Serial Number: FH.42.6.1355B | Inspector: RAJ KHAN |
| Location: VALHALLA | | Year Built: 1987 | Shell MAWP PSI: 638 MAWT F: 350 | Process: SOUR |
| Skid: SKD0175 | | Tag Number: - | Tube MAWP PSI: 0 MAWT F: 0 | Project #: C70099 |
| | | CRN: F9168.2 | Vessel CA: 0.1250 | |

| Band | Description | | | Readings | | | | | | Year | Avg Inches | Min Inches | Nominal | CA | TMIN | Recommended Next Inspection | Recommended Retirement Date |
|----------|--------------|------------|----------|----------|-------|-------|-------|-------|-------|-------------|------------|------------|-------------|--------|--------|-----------------------------|-----------------------------|
| | | | | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | |
| 8-25 | Upper | Shell | Baseline | 1.005 | 1.002 | 1.004 | 1.005 | 1.005 | 1.001 | 2006 | 1.004 | 1.001 | 1.0000 | 0.1250 | 0.7454 | 2012 | 2031 |
| Shape | Cylindrical | Shell Side | Previous | 1.005 | 1.002 | 1.004 | 1.005 | 1.005 | 1.001 | 2006 | 1.004 | 1.001 | Comments--> | | | | |
| OD | 42 | | Current | 1.005 | 1.002 | 1.004 | 1.005 | 1.005 | 1.001 | 2011 | 1.004 | 1.001 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-30 | Top | Head | Baseline | 0.990 | 0.990 | 1.012 | 1.035 | 1.040 | 1.040 | 2006 | 1.018 | 0.990 | 0.9900 | 0.1250 | 0.7322 | 2012 | 2031 |
| Shape | Ellipsoidal | Shell Side | Previous | 0.990 | 0.990 | 1.012 | 1.035 | 1.040 | 1.040 | 2006 | 1.018 | 0.990 | Comments--> | | | | |
| OD | 42 | | Current | 0.990 | 0.990 | 1.001 | 1.035 | 1.040 | 1.040 | 2011 | 1.016 | 0.990 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 516 - 70 | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-35 | Boot | Shell | Baseline | 0.593 | 0.589 | 0.589 | 0.577 | 0.576 | 0.576 | 2006 | 0.583 | 0.576 | 0.5930 | 0.1250 | 0.2093 | 2012 | 2031 |
| Shape | Cylindrical | Shell Side | Previous | 0.593 | 0.589 | 0.589 | 0.577 | 0.576 | 0.576 | 2006 | 0.583 | 0.576 | Comments--> | | | | |
| OD | 10.75 | | Current | 0.593 | 0.589 | 0.589 | 0.577 | 0.576 | 0.576 | 2011 | 0.583 | 0.576 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 106 - B | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |
| 8-40 | Boot | Head | Baseline | 0.608 | 0.560 | 0.560 | 0.567 | 0.564 | 0.566 | 2006 | 0.571 | 0.560 | 0.5930 | 0.1250 | 0.2048 | 2012 | 2031 |
| Shape | Ellipsoidal | Shell Side | Previous | 0.608 | 0.560 | 0.560 | 0.567 | 0.564 | 0.566 | 2006 | 0.571 | 0.560 | Comments--> | | | | |
| OD | 10.75 | | Current | 0.574 | 0.560 | 0.560 | 0.567 | 0.564 | 0.566 | 2011 | 0.565 | 0.560 | | | | | |
| Spec. | VIII Div 1 | | | | | | | | | ST Loss MPY | 0.000 | OK | | | | | |
| Material | SA 234 - WPB | | | | | | | | | LT Loss MPY | 0.000 | | | | | | |



ULTRASONIC CORROSION SURVEY

Survey Name: CNRL

| | | | | |
|----------------------------|--------|-------------------------|---------------------------------|----------------------|
| LSD: 16-35-074-11W6 | Dwg: 8 | Vessel Number: A0228931 | Manufacturer: OPSCO | Survey Date: 1/27/11 |
| District Unit: WEST COUNTY | | Vessel Name: SEPARATOR | Serial Number: FH.42.6.1355B | Inspector: RAJ KHAN |
| Location: VALHALLA | | Year Built: 1987 | Shell MAWP PSI: 638 MAWT F: 350 | Process: SOUR |
| Skid: SKD0175 | | Tag Number: - | Tube MAWP PSI: 0 MAWT F: 0 | Project #: C70099 |
| | | CRN: F9168.2 | Vessel CA: 0.1250 | |

| Band | Description | | Readings | | | | | | Year | Avg Inches | Min Inches | Nominal | CA | TMIN | Recommended Next Inspection | Recommended Retirement Date |
|----------|--------------|------------|----------|-------------|-------|-------|-------|-------|-------|------------|------------|---------|-------------|--------|-----------------------------|-----------------------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | |
| 8-45 | Nozzle | Baseline | 0.444 | 0.446 | 0.446 | 0.444 | 0.441 | 0.443 | 2006 | 0.444 | 0.441 | 0.4370 | 0.1250 | 0.0575 | 2012 | 2031 |
| Shape | 90° Elbow | Shell Side | Previous | 0.444 | 0.446 | 0.446 | 0.444 | 0.441 | 0.443 | 2006 | 0.444 | 0.441 | Comments--> | | | |
| OD | 3.5 | | Current | 0.444 | 0.446 | 0.446 | 0.444 | 0.441 | 0.443 | 2011 | 0.444 | 0.441 | | | | |
| Spec. | VIII Div 1 | | | ST Loss MPY | | | | | | 0.000 | OK | | | | | |
| Material | SA 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | |
| 8-50 | Piping | Baseline | 0.181 | 0.180 | 0.180 | 0.179 | 0.177 | 0.181 | 2006 | 0.180 | 0.177 | 0.2180 | 0.0272 | 0.0373 | 2012 | 2031 |
| Shape | 90° Elbow | Shell Side | Previous | 0.181 | 0.180 | 0.180 | 0.179 | 0.177 | 0.181 | 2006 | 0.180 | 0.177 | Comments--> | | | |
| OD | 2.375 | | Current | 0.181 | 0.180 | 0.180 | 0.179 | 0.177 | 0.181 | 2011 | 0.180 | 0.177 | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | 0.000 | Caution | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | |
| 8-55 | Piping | Baseline | 0.322 | 0.327 | 0.328 | 0.328 | 0.323 | 0.327 | 2006 | 0.326 | 0.322 | 0.3370 | 0.0421 | 0.0706 | 2012 | 2031 |
| Shape | 90° Elbow | Shell Side | Previous | 0.322 | 0.327 | 0.328 | 0.328 | 0.323 | 0.327 | 2006 | 0.326 | 0.322 | Comments--> | | | |
| OD | 4.5 | | Current | 0.322 | 0.327 | 0.328 | 0.328 | 0.323 | 0.327 | 2011 | 0.326 | 0.322 | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | 0.000 | OK | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | |
| 8-60 | Piping | Baseline | 0.338 | 0.332 | 0.336 | 0.338 | 0.336 | 0.344 | 2006 | 0.337 | 0.332 | 0.3370 | 0.0421 | 0.0706 | 2012 | 2031 |
| Shape | 90° Elbow | Shell Side | Previous | 0.338 | 0.332 | 0.336 | 0.338 | 0.336 | 0.344 | 2006 | 0.337 | 0.332 | Comments--> | | | |
| OD | 4.5 | | Current | 0.338 | 0.332 | 0.336 | 0.338 | 0.336 | 0.339 | 2011 | 0.337 | 0.332 | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | 0.000 | OK | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | |



ULTRASONIC CORROSION SURVEY

Survey Name: CNRL

| | | | | |
|----------------------------|--------|-------------------------|---------------------------------|----------------------|
| LSD: 16-35-074-11W6 | Dwg: 8 | Vessel Number: A0228931 | Manufacturer: OPSCO | Survey Date: 1/27/11 |
| District Unit: WEST COUNTY | | Vessel Name: SEPARATOR | Serial Number: FH.42.6.1355B | Inspector: RAJ KHAN |
| Location: VALHALLA | | Year Built: 1987 | Shell MAWP PSI: 638 MAWT F: 350 | Process: SOUR |
| Skid: SKD0175 | | Tag Number: - | Tube MAWP PSI: 0 MAWT F: 0 | Project #: C70099 |
| | | CRN: F9168.2 | Vessel CA: 0.1250 | |

| Band | Description | | Readings | | | | | | Year | Avg Inches | Min Inches | Nominal | CA | TMIN | Recommended Next Inspection | Recommended Retirement Date | |
|----------|-------------|------------|----------|-------------|-------|-------|-------|-------|------|------------|------------|---------|--------|--------|-----------------------------|-----------------------------|--|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | | |
| 8-65 | Piping | Baseline | 0.208 | 0.207 | 0.211 | 0.207 | 0.210 | 0.214 | 2011 | 0.210 | 0.207 | 0.2180 | 0.0272 | 0.0373 | 2012 | 2031 | |
| Shape | 90° Elbow | Shell Side | Previous | Comments--> | | | | | | | | | | | | | |
| OD | 2.375 | Current | 0.208 | 0.207 | 0.211 | 0.207 | 0.210 | 0.214 | 2011 | 0.210 | 0.207 | | | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | OK | | | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | | |
| 8-70 | Piping | Baseline | 0.195 | 0.194 | 0.191 | 0.191 | 0.191 | 0.194 | 2011 | 0.193 | 0.191 | 0.2180 | 0.0272 | 0.0373 | 2012 | 2031 | |
| Shape | 90° Elbow | Shell Side | Previous | Comments--> | | | | | | | | | | | | | |
| OD | 2.375 | Current | 0.195 | 0.194 | 0.191 | 0.191 | 0.191 | 0.194 | 2011 | 0.193 | 0.191 | | | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | OK | | | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | | |
| 8-75 | Piping | Baseline | 0.293 | 0.296 | 0.294 | 0.299 | 0.296 | 0.293 | 2011 | 0.295 | 0.293 | 0.3000 | 0.0375 | 0.0549 | 2012 | 2031 | |
| Shape | 90° Elbow | Shell Side | Previous | Comments--> | | | | | | | | | | | | | |
| OD | 3.5 | Current | 0.293 | 0.296 | 0.294 | 0.299 | 0.296 | 0.293 | 2011 | 0.295 | 0.293 | | | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | OK | | | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | | |
| 8-80 | Piping | Baseline | 0.362 | 0.363 | 0.369 | 0.369 | 0.369 | 0.367 | 2006 | 0.367 | 0.362 | 0.3370 | 0.0421 | 0.0706 | 2012 | 2031 | |
| Shape | 90° Elbow | Shell Side | Previous | Comments--> | | | | | | | | | | | | | |
| OD | 4.5 | Current | 0.362 | 0.363 | 0.369 | 0.369 | 0.369 | 0.367 | 2011 | 0.367 | 0.362 | | | | | | |
| Spec. | B31.3 | | | ST Loss MPY | | | | | | 0.000 | | | | | | | |
| Material | A 234 - WPB | | | LT Loss MPY | | | | | | 0.000 | | | | | | | |



ULTRASONIC CORROSION SURVEY

Survey Name: CNRL

| | | | | |
|----------------------------|--------|-------------------------|---------------------------------|----------------------|
| LSD: 16-35-074-11W6 | Dwg: 8 | Vessel Number: A0228931 | Manufacturer: OPSCO | Survey Date: 1/27/11 |
| District Unit: WEST COUNTY | | Vessel Name: SEPARATOR | Serial Number: FH.42.6.1355B | Inspector: RAJ KHAN |
| Location: VALHALLA | | Year Built: 1987 | Shell MAWP PSI: 638 MAWT F: 350 | Process: SOUR |
| Skid: SKD0175 | | Tag Number: - | Tube MAWP PSI: 0 MAWT F: 0 | Project #: C70099 |
| | | CRN: F9168.2 | Vessel CA: 0.1250 | |

| Band | Description | | Readings | | | | | | Year | Avg Inches | Min Inches | Nominal | CA | TMIN | Recommended Next Inspection | Recommended Retirement Date |
|----------|-------------|------------|----------|-------|-------|-------|-------|-------------|-------|------------|------------|---------|-------------|--------|-----------------------------|-----------------------------|
| | | | 1 | 2 | 3 | 4 | 5 | 6 | | | | | | | | |
| 8-85 | Piping | Baseline | 0.317 | 0.325 | 0.317 | 0.317 | 0.323 | 0.328 | 2006 | 0.321 | 0.317 | 0.3370 | 0.0421 | 0.0706 | 2012 | 2031 |
| Shape | 90° Elbow | Shell Side | Previous | 0.317 | 0.325 | 0.317 | 0.317 | 0.323 | 0.328 | 2006 | 0.321 | 0.317 | Comments--> | | | |
| OD | 4.5 | Current | 0.317 | 0.325 | 0.317 | 0.317 | 0.323 | 0.328 | 2011 | 0.321 | 0.317 | | | | | |
| Spec. | B31.3 | | | | | | | ST Loss MPY | 0.000 | | OK | | | | | |
| Material | A 234 - WPB | | | | | | | LT Loss MPY | 0.000 | | | | | | | |