

2023 INSPECTION & TEST PLAN

STATIC DATA					
Plant	Manitou	Eq#	66155548	Manufacturer	Wilco Industries
LSD	01-30-044-26W3	Tag #	T-104	Serial #	016040-10

Summary

Due	Method	Completed by	Certification
2023	Visual internal (VI)	API 653 Certified AGST Inspector	API 653
2023	Visual external (VE)	API 653 Certified AGST Inspector	API 653
2023	Ultrasonic testing (UT)	NDE contractor – UT technician	CGSB level 1 or 2
2023	Magnetic Flux Leakage (MFL)	NDE contractor – MFL technician	As Per API 653 Annex G

Preparation

- Ensure safe access to all areas of the tank internal and external.
- Tank to be internally clean and dry on floor, first course and up the 2nd shell as high as possible.
- Ensure all nozzles and couplings are cleaned out and dry for visual inspection.

Notes

- Inspection to be done in accordance with attached HUSKY TASKLIST QNATANK-2

VI & VE

Notes

- Visual inspection to be completed by API 653 Above ground storage tank inspector

MFL & UT

Notes

- MFL examination of the floor to be completed by qualified technician as per API 653 Annex G
- MFL indications to be examined with UT and measurements to be mapped
- UT on Tank shell to be completed every 2' around the circumference, from 6" elevation to the top leg of the floor to shell weld.
- Add measurements and locations to CML Map.
- CML's must be scanned, and the minimum thickness is to be recorded
- If corrosion is found, technician must comment on the nature of the corrosion (e.g., localized corrosion, pitting, etc.)
- Any questions regarding the scope of examination please call Terry Neufeld 780-818-8468

Area	Thickness	Action Required
Nominal Thickness	Floor: 0.250"; Shell: 0.250" Roof: 0.188"	None
Minimum Required Thickness	Floor: 0.100" (API 653 Table 4.4)	UT - flag RED
	Shell: 0.100"	
Alert Thickness	Floor: 0.140"	UT - flag YELLOW

**QNATANK-2 5Y Code Inspection Tank 400 to 1000 bbl,
Uncoated**

This task list is not all inclusive and does not limit any additional inspection or examination or limit the areas to be examined. The inspector may use any additional reasonable means deemed necessary to determine the integrity of the tank for code compliance and suitability for continued service

External Inspection

All deficiencies are to be recorded and photographs taken
All evidence of corrosion is to be mapped and depth measured with pit or depth gauge

Ladders, stairways and platforms

1) Handrails, inspect for
pitting, holes and paint condition
condition of attachment welds
condition of mid rails and toe boards
condition of safety drop bars for corrosion, operation, and length

2) Platform frame inspect for
corrosion and paint failure
corrosion and cracking of attachment welds
reinforcing pads where supports are attached to the shell and roof
thinning and holes in the deck plate or distortion of the grating
seal welds on flat-surface to flat-surface junctures

3) Deck plate and grating, inspect for
corrosion, holes and paint failure
scale build-up on plate to frame weld
thinning of bars and failure of welds on grating

All deficiencies to be noted. Unsafe conditions to be brought to the attention of Operations for immediate repair.
Unsafe items are not to be used during inspection.

Foundation and site

1) Foundation inspect for
measure foundation levelness and bottom elevations.
type of foundation
cavities under foundation and vegetation against bottom of
the tank.
verify that runoff rainwater drains away from the tank
settlement around perimeter of tank.
areas where leaching of oil has left rock filler exposed

2) Site and dike inspect for
condition of the dike
drainage away from the tank and associated piping and
manifolds
operation of dike drains
buildup of trash, vegetation, and other inflammables.

Shell and appurtenances

1) Shells inspect for
paint failures, pitting, and corrosion
corrosion and thinning at the bottom angle area where the
floor and shell are attached
dents, bulges or buckling

2) Manways and nozzles, inspect for
cracks or signs of leakage on the weld joints at nozzles,
manway, reinforcing plates
shell dimpling around nozzles
flange leaks around manways and nozzles,
sealing of insulation around manway flange and nozzles.
Inadequate manway flange and cover thickness on mixer
manways

3) Tank piping manifolds, inspect for
leak around valves, piping and flanges
fire fighting system components
anchored piping that could damage the tank shell or bottom
connections during earth movements
adequate thermal pressure relief of piping to the tank
operation of regulators for tanks with purge gas systems
leaks around sample connections
damage and check accuracy of temperature indicators

If deficiencies are noted additional inspection of associated piping or support system is required to determine cause and recommended resolution

4) Autogauge system, inspect for
leaks around the tape guide and lower sheave housing
damage to autogauge head
proper movement of the tape
condition of the board and legibility of board type
autogauges
freedom of movement of the marker and float

All deficiencies to be noted and brought to the attention of Operations for immediate repair.

5) Shell mounted sample station inspect for
function of valves and plugged lines including drain line
and return to tank line
leaks around circulation pump and operating problems
damaged bracing or supports for sampling system and piping

6) Heater, inspect for
presence of product in condensate drain line from steam
type heater
leaks around bolting flange for heater inlets

7) Overflow lines inspect for
screens are clean
corrosion
no plugs in lines
broken connections
freeze damage

8) Shell insulation, inspect for
cracks or leaks in the insulation weather coat
wet insulation under the weather coat
corrosion under insulation by removing sample areas

Roof and appurtenances

NOTE: For safety, before accessing the roof, check with an ultrasonic instrument near the edge of the roof for thinning. Verify the roof thickness is sufficient for safe support. (Corrosion normally attacks the deck plate at the edge of a fixed roof and at the rafters in the center of the roof first)

1) Deck plate inspect for, paint failure, pitting, holes and corrosion product on the roof deck

2) Deck drainage, inspect for indications of standing water

3) Roof insulation, inspect for cracks or leaks in the insulation weather coat
wet insulation under the weather coat
corrosion under insulation by removing sample areas

4) Sample hatch inspect for condition and functioning of the sample hatch cover
condition of the seal inside of the hatch cover
corrosion and plugging on thief and gauge hatch cover
marked and tab stating hold off distance (where sample hatch is used to gauge product level
condition of any internal lining of the sample hatch

5) Gaugewell inspect for thinning of the visible portion of the well, size of slots and cover condition
hold off marker and tab for legibility
condition of roof guide and rollers on gauge well for floating roofs
distance from gauge well to tank shell at different levels if accessible

6) Pressure / Vacuum breakers, inspect for proper operation, size, number, and type

All deficiencies to be noted and brought to the attention of Operations for immediate repair.

External NDE

1) Complete ultrasonic thickness survey in accordance with tank UT circuit drawing

2) Perform additional ultrasonic, liquid penetrant or magnetic particle inspection necessary to verify tank condition and integrity at identified areas of mechanical damage, blistering, cracks or corrosion.

Internal Inspection

All deficiencies are to be recorded and photographs taken
All evidence of corrosion is to be mapped and depth measured with pit or depth gauge

General

1) Ensure tank has been high pressure washed or steamed to remove residual product to Class 3 cleanliness.

2) Shell inspect for
banding and peaking of shell welds
corrosion of the shell
roundness and out of plumb
corrosion at the critical zone of the floor to shell joint

3) Floor inspect for
corrosion of floor underside
voids under the bottom
indications of leakage
floor to shell edge settlement

4) Roof inspect for
corrosion, holes and other deterioration
broken welds in shell to roof joint

5) Internal heaters inspect for
broken or damaged piping
debris accumulation
corrosion of components
coating damage from overheating
accelerated corrosion of the floor and shell in the area of the heater

6) Piping and sumps inspect for
corrosion and coating condition
pluggage
holes
distortion at shell to pipe connection

INTERNAL NDE

1) Perform ultrasonic thickness checks of internal nozzle projections, coils and permanent internals exhibiting corrosion and metal loss.

- 2) Perform additional NDE per vessel's last inspection report recommendations
- 3) Perform additional ultrasonic, liquid penetrant or magnetic particle inspection necessary to verify vessel condition and integrity at identified areas of mechanical damage, blistering, cracks or corrosion.



Tank Inspection Report

Location: 01-30-044-26W3

Tank Type: T-104 Step tank

Date: Oct 19 2018

Mfg: Wilco LND.

Year blt: 2018

S/N: 016040-10

CAP: / 000 bbl

Floor Thk: 1/4"

Shell Thk: 1/4" 3/16"

Roof Thk: 3/16"

Requisitioned by: Kyle Forbes

Approver: Kyle Forbes

Approver Code: 22-02017604

WO #: 81291186

PO#: 840128100

CC:

SAP #: 66155548

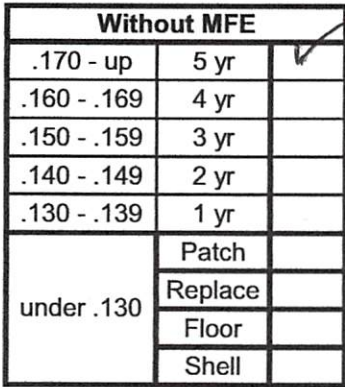
EXTERNAL INSPECTION:

ID	Item	Yes	Good	N/A	See Notes
	GENERAL				
T1	Other (Please Explain)				
T2	Corrosion			✓	
T3	Leaks			✓	
T4	Vibration			✓	
T5	Dissimilar Flange Rating			✓	
T6	Ladder/Stairway	✓	✓		
T7	Platform	✓	✓		
T8	Electrical Ground	✓	✓		
T9	Cathodic Protection			✓	
T10	Painted Inactive Corrosion			✓	
T11	Coating/Painting			✓	
T12	Level Gauge	✓	✓		1
T13	Bottom	✓	✓		2
T14	Secondary Containment			✓	
T15	Shell	✓	✓		
T16	Roof	✓	✓		
T17	Agitator/ Mixer			✓	
	SUPPORTS				
T31	Other (Please Explain)				
T32	Foundation	✓	✓		2
T33	Anchor Bolts			✓	
T34	Windgirders			✓	
	CONNECTIONS				
T41	Other (Please explain)				
T42	Small Branches	✓	✓		
T43	Nozzles	✓	✓		
T44	Pipe Manifolds			✓	
T45	Swing Lines			✓	
T46	Manways/Hatches	✓	✓		
T47	Reinforcing Pads	✓	✓		
T48	Inadequate Thread Engagement			✓	
T49	Bolting	✓	✓		
T50	Flanges	✓	✓		
T51	Leak Clamps			✓	
	INSULATION				
T61	Other (Please explain)				
T62	Damage			✓	
T63	Penetrations	✓	✓	✓	
T64	Jacket			✓	
T65	Banding			✓	
T66	Seals/Joints			✓	
	RELIEF DEVICE				
T71	Other (Please explain)				
T72	Corrosion				
T73	Leaks				
T74	Restricted Inlet/Outlet				
T75	Manual Operation Lever				

INTERNAL INSPECTION:

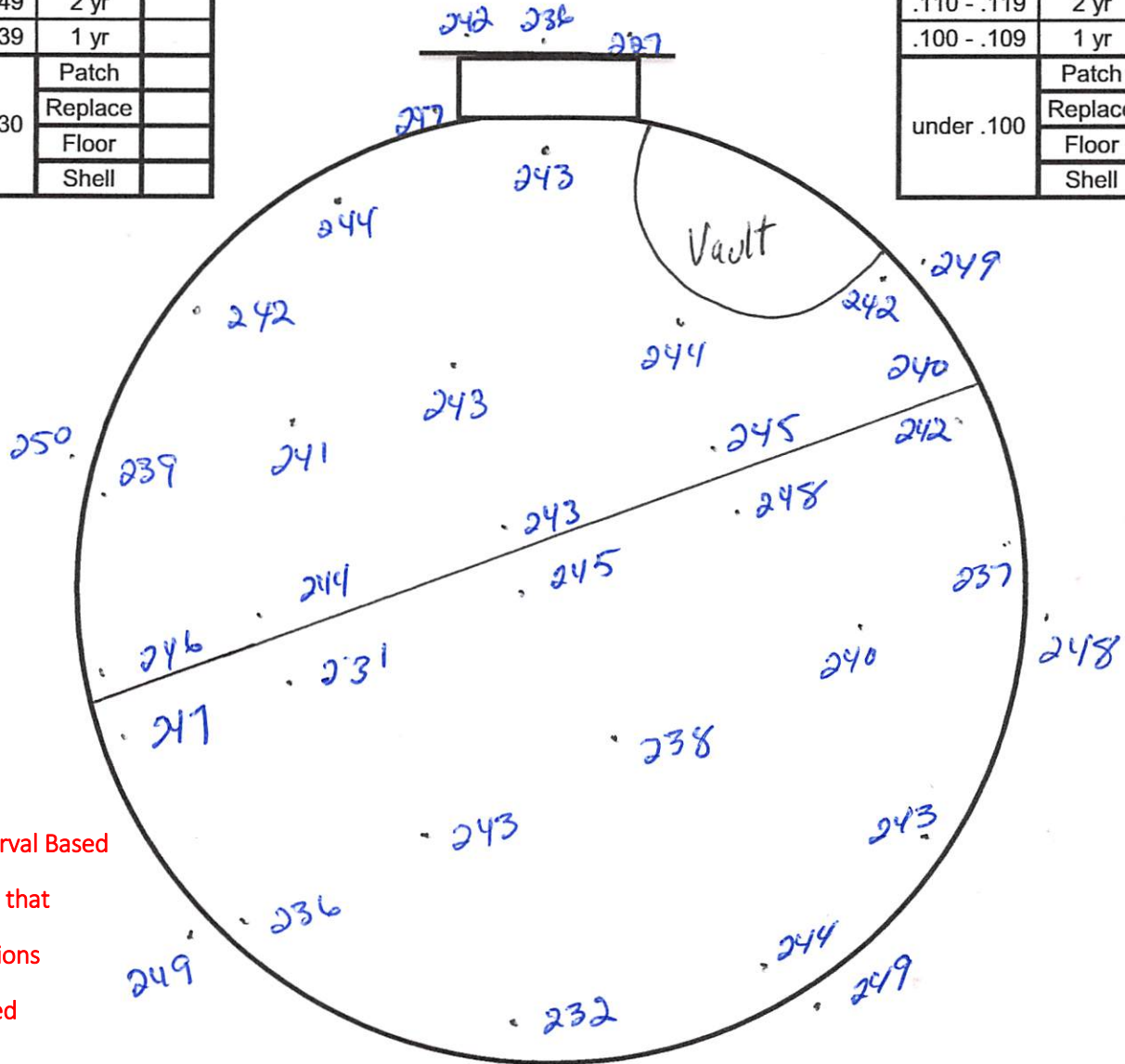
ID	Item	Yes	Good	N/A	See Notes
	GENERAL				
T1	Other (Please Explain)				
T2	Corrosion			✓	
T3	Erosion			✓	
T4	Distortion			✓	
T5	Blisters			✓	
T6	Deposits			✓	
T7	Welds	✓	✓		
T8	Nozzles	✓	✓		
T9	Shell	✓	✓		
T10	Roof	✓	✓		
T11	Floor	✓	✓		
	GENERAL				
T21	Other - Firetube	✓	✓		3
T21	Other - Anodes			✓	
T22	Annular Ring			✓	
T23	Sump			✓	
T24	Roof Supports			✓	
T25	Thermowells	✓	✓		
T26	Metallic Linings			✓	
T27	Non Metallic Linings			✓	
T28	Internal Steam Coil / other Piping	✓	✓		
T29	Level Gauge	✓	✓		4
T30	Other Welded Attachments	✓	✓		
	Backwelding Req'd			✓	

[illegible]



Location: 01-30-044-26W3

With MFE		
.140 - .150	5 yr	
.130 - .139	4 yr	
.120 - .129	3 yr	
.110 - .119	2 yr	
.100 - .109	1 yr	
under .100	Patch	
	Replace	
	Floor	
	Shell	

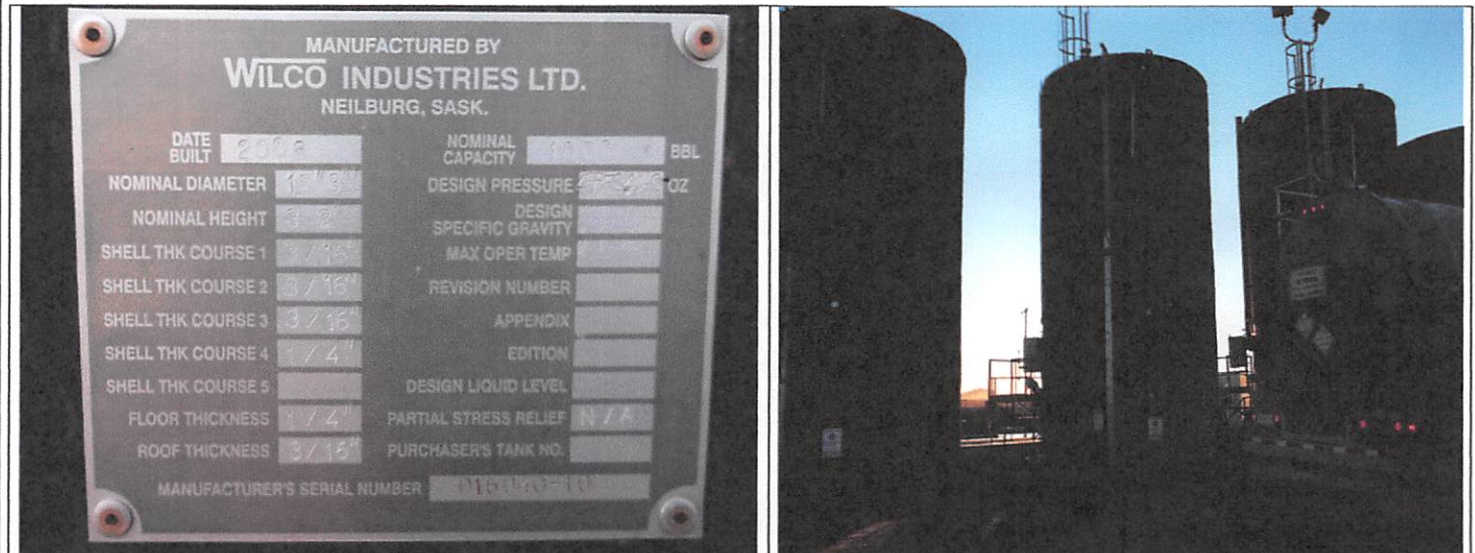


Comments:

Oct 30, 2018

Type of Inspection: VT/ UT	Rev: 3.0	Client: HUSKY OIL OPERATIONS LIMITED	Date: 19-Oct-18
Test Technique: UT thickness		IRISNDT #: LYN1801663	WO #: 81291186
Equipment: DMSGO, FH2E, Flashlight, Grinder		Location: 01-30-044-26W3	PO #: 8401228100
Code/Standard: Client Information		Item Inspected: Tank T-104 SN: 016040-10	Appr# 2Z-02017604

A UT and Visual inspection was carried out on the following 10000BBL oil tank for the purpose of continued fitness for service and determination of inspection interval. See the field report for results of inspection, UT recorded values and inspection interval.



Recommendations :

-Recommend removing the float guide wires
Tank suitable for service

Note: Spot UT carried out on the floor and shell as a representation of overall integrity not a 100% scan method.
DMSGO # 31139 cal. date due. June 1 2019 Probe: FH2E SN: SCA0620

Inspection Limitation(s): Only 1st course cleaned for inspection

Unit#: 667 Kilometers: _____ In: _____ Out: _____ Hrs: _____ In: _____ Out: _____ Hrs: _____ Personnel: Logan Skinner	Consumables: Min Requested By: Kyle Forbes Approver: Kyle Forbes	Interpretation by: Logan Skinner (Print) (Sign) Client Representative: (Print) Karen Hawryluk (Sign) I am in full agreement with report contents	SNT-TC-1A: UT-1 C.G.S.B.: 1 (Level) C.G.S.B #: 17159
---	---	---	---

5311 - 86 Street NW, Edmonton, Alberta T6E 5T8 Phone (780) 437-4747 Fax (780) 436-4873
 Calgary (403) 279-6121 Cold Lake (780) 826-6105
 Lloydminster (780) 875-6455 Fort McMurray (780) 743-1536
 Barrhead (780) 674-3018 Red Deer (403) 347-1742
 Nisku (780) 955-7616
 www.irisndt.com

Engineering, Calgary (403) 217-9684
 Engineering, Edmonton (780) 437-2022
 Rope Access Services (780) 437-2022
 Offices also located in USA and UK