

DATA SHEET

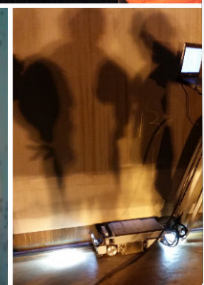
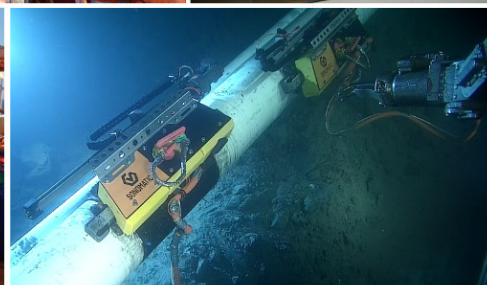
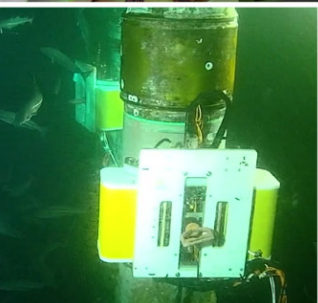
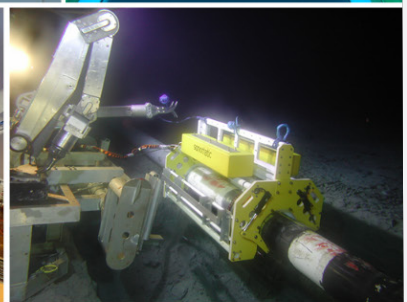
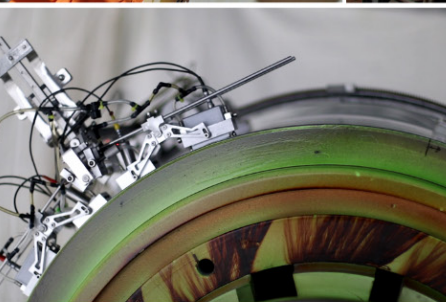
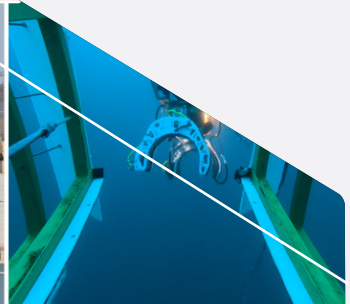
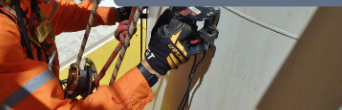
OUT OF SERVICE TANK INSPECTION

THE PURPOSE

This document is composed to assist our clients and the supply chain with a high-level understanding of the benefits and services associated with our out of service tank inspection.



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OUT OF SERVICE TANK INSPECTION

Tank roof maintenance checks – This type of inspection is conducted while the tank is at top dip or, if below top dip, conducted using breathing apparatus. Below is the list of the activities that are carried out and recorded for our clients.

- Remove cover from drainage sump.
- Clear all debris from sump and remove from roof.
- Check operation of NRV.
- Check all pontoons for LEL's and liquid.
- Refit pontoon and ensure securely fitted.
- Check landing legs and gauging poles for signs of damage/corrosion (inc pins and retaining clips).
- Ensure all ABV's are free of debris/damage.
- Ensure all rim vents are free of debris/damage.
- Check seal for signs of wear, corrosion and distortion.
- Ensure shunts are in contact with tank shell. Record if not.
- Inspect all RGA's and roof earthing arrangements.
- Inspect visible sections of tank shell for signs of scraping and damage.
- Remove standing water from tank roof.
- Inspect condition of roof ladder (if present).
- Inspect roof plates for signs of corrosion, damage or cracking.
- Carry out a continuity check between the tank roof and shell to confirm protection against lighting and static is functioning.

Below is a snippet of the redacted report we produce:

Tank Condition Checklist

RA-OD 041
Issue 04 / Rev 03
Tank Condition Checklist
Rev Date – 20/04/2021

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TANK CONDITION CHECK

TANK XXX

REPORT INFORMATION

REPORT NUMBER				
TM-81				
Tank Number	Tank Location	Date of Maintenance Check		
Tank XXX	XXXXX			
Client	WON Number	Client Representative		
XXXXXXX	XXXXXX	XXXXXXXXXXXX		
Author	Date	Approver	Date	Sonomatic Personnel

Sonomatic RAIS

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Bo'ness Road,
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2.1 SCOPE OF WORK

1. Remove cover from drainage sump

2. Clear all debris from sump and remove from roof

3. Check operation of NRV

4. Check all pontoons for LEL's / evidence of liquid and general pontoon condition. (Photographs will be taken and provided to client using IS camera.)

5. Refit pontoon and ensure securely fitted

6. Check landing legs and gauging poles for signs of damage/corrosion (inc pins and retaining clips, rollers, seals etc)

7. Ensure all ABV's are free of debris/damage

8. Ensure all rim vents are free of debris/damage

9. Ensure foam dam is free of debris/damage and ensure drainage holes are clear.

10. Check seals for signs of wear, corrosion and distortion

11. Ensure shunts are in contact with tank shell. Record if not.

12. Inspect all RGA's and roof earthing arrangements, check connections on all earthing points for damage

13. Inspect visible sections of tank shell for signs of scraping and damage

14. Inspect condition of roof ladder (if present)

15. Inspect roof plates for signs of corrosion, damage or cracking

16. Carry out a continuity check between the tank roof and shell to confirm protection against lightning and static is functioning

17. Roof to shell measurements at 0 compass points around the tank

18. Photographic survey of the condition of the roof and shell

Plus – Any other work/job request to be added or removed

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2 RESULTS

2.1 PHOTO

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2.2 Pontoon Gas Test Results. Gas Monitor No- 2334 (XXXXXX)

	O2	LEL %	CO	H2S	Comments
1 (Under Gaugers Platform)	20.9	0	0	0	No seal on lid. Internal dry & clear
2	20.9	0	0	0	No seal on lid. Internal dry & clear
3	20.9	0	0	0	Seal on lid OK. Internal dry & clear
4	20.9	0	0	0	Seal on lid OK. Internal dry & clear
5	20.9	0	0	0	Seal on lid OK. Dark staining, possible old leakage/repairs, at centre side left-hand corner.
6	20.9	0	0	0	Seal on lid OK. Dark staining, possible old leakage/repairs, at centre side left-hand corner.
7	20.9	0	0	0	Seal on lid OK. Dark staining, possible old leakage/repairs, at centre side left-hand corner.
8	20.9	0	0	0	Seal on lid OK. Dark staining, possible old leakage/repairs, at centre side left-hand corner.
9	20.9	0	0	0	Seal on lid OK. Dark staining, possible old leakage/repairs, at centre side left-hand corner.
10	20.9	0	0	0	Seal on lid OK. Internal dry & clear
11	20.9	0	0	0	Seal on lid OK. Internal dry & clear
12	20.9	0	0	0	Seal on lid OK. Internal dry & clear
13	20.9	0	0	0	Seal on lid OK. Internal dry & clear
14	20.9	0	0	0	Seal on lid OK. Internal dry & clear
15	20.9	0	0	0	Seal on lid OK. Internal dry & clear
16	20.9	0	0	0	Seal on lid OK. Internal dry & clear

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2.3 TANK CONDITION CHECKLIST

Type of Tank	Floating roof with a walkway around circumference of tank.
Tank Position when inspected	Tank was 12.5 metres full or 5 metres down from gaugers platform.
Access to Tank	Shared stair access with tank XXX. Gaugers platform is positioned on the north side of the tank with back scratcher ladder access to south side of walkway.
Access into Tank	Access is from the gaugers platform to the in-situ vertical ladder which allows access onto the tank roof. Ladder access is only possible when the roof is at top dip. Rope access techniques were used to access egress tank roof.
Shell Condition Internal	Could only see around top 5 metres of internal shell. Some product build up at top circumference of shell.
Shell Condition External	Some paint breakdown on stiffener ring otherwise visibly in good condition
Centre Deck	Large area of pooling water at northwest of centre deck.
Upper Seal	Around 60% of upper seal is badly damaged. The seal material is ripped on the east, northeast and south side of tank.
Primary Seal	Some debris and product build up covering around 50% of the primary seal due to secondary seal being damaged. The parts of the seal we can see has a good contact to the tank shell.
Foam Dam	Foam dam was full of water. Mouse holes were cleared and pooling water was draining. Foam dam was visibly in good condition.
Foam Dam Mouse Holes	Very clogged up with debris from foam dam. These have been unblocked and the water is now draining.
Manways	2 of these on the centre deck. Both have gaskets intact and are visibly in a good condition.
Landing Support Leg Position	Operational position (Up)
Number of Legs	64 on pontoon 105 on centre deck TOTAL 169 (8 are missing R clips on bolts so we have installed wire cables as a temporary fix)
Number of ABV Legs and condition of ABV's	10 ABV's on centre deck. All gaskets look intact however staining on ABV's show signs of previous leakage.
Leg Socks	No Socks on legs but all legs had leg caps bolted on top of them.

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2 DATA SHEET - OUT OF SERVICE TANK INSPECTION

NDT EXTERNAL AND INTERNAL INSPECTION

The below methods are deployed either externally or internally on the tank:

External:

- RMS 300 – Tank shell crawler will inspect the shell vertically gathering data bottom to top on a 300mm wide scan.

Internal:

- Floormap®X is the latest multi-technology MFL Array tank bottom solution from Silverwing. It offers an unmatched probability of detection – including in the critical zone – and can address thick plates and coatings. Thanks to patented STARS technology, it provides top/bottom corrosion discrimination. Blazing fast, it can either be used in full floor mapping or Freescan™ mode. FloormapX increases efficiency when inspecting tank bottoms like no other system.
- Vac-Box inspection

Both External and Internal:

- ACFM – Using ACFM we can inspect the Shell to floor weld, Nozzle welds, compensation welds along with plate weld without the need to remove the paint coating.
- Ultrasonic Inspection – Manual UT is used to complete thickness and or volumetric inspections
- Radiography Inspection
- Magnetic Particle Inspection
- Dye Penetrant Inspection
- Phased Array – Corrosion Mapping / Weld inspection
- ToFD
- Eddy Current
- Throat Thickness

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ACFM

The Alternating Current Field Measurement, or ACFM, technique was specifically developed to detect and size surface-breaking defects on and around rough welds through several millimeters of non-conductive coating. This is a key advantage because just the costs associated with paint removal, post MPI re-blasting, and recoating is typically four or five times more expensive than the MPI itself. The benefits don't end there; read on for more details!

While the main failure point in storage tanks is corrosion in the floor plates, from either the top surface or from the underside, the welded sections are also a direct source for damage mechanisms. ACFM is proving itself as the most cost efficient and trusted method for inspecting storage tank welds to supplement corrosion mapping, successfully detecting large cracks often missed by MPI. You can't deny the cost savings of ACFM over MPI; overall, ACFM jobs are typically six times less expensive than their MPI counterparts while providing the added value of a more reliable inspection with data rich information to pass along to the asset owner.

PERFORMANCE THROUGH TECHNOLOGY: BREAKING THE BARRIER

Silverwing FloormapX: Setting new standards in the field of tank floor scanners, the FloormapX breaks existing boundaries and defines new levels of excellence. The Silverwing FloormapX supports multiple scan modes and multiple reporting options to suit any procedure, any client requirement. FloormapX features three scanning modes, all accessed from within a single on-board software platform including Mapping, Freescan Mode and Pause on Defect. The FloormapX seamlessly combines two core technologies on one single system - enhance MFL and Stars.

The FloormapX incorporates the industry's most advanced signal processing algorithms, combined with cutting edge electronics, and smart hardware that results in unrivalled probability of detection, resolution, and signal clarity.

Every design element of FloormapX is focused on efficiency and accuracy from inspection through data analysis to report submission. Software controls are mirrored in hardware buttons in easy reach of the operator - the system can be fully controlled without removing hands from the control handles.



QA AND HS&E

Sonomatic operate under an integrated QHSE management system and are committed to the highest quality and safety of service provision | ISO 9001: 2015: 00007140 | ISO 14001:2015:00037371 | ISO 45001:2018:00037372 | ISO 17020: 2012: 4276 | Achilles FPAL Verified: 076712 | SEQual 1988 | British Safety Council Member: S0388440 |



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