Report On

FCC Testing of the
SRT Marine Technology Ltd
Mercury 409-0002 AIS SART
In accordance with FCC CFR 47 Part 15B and ICES-003

COMMERCIAL-IN-CONFIDENCE

FCC ID: UYW-4090002
IC ID: 7075A-4090002

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November 2012

PREPARED FOR

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Authorised Signatory

DATED 08 November 2012

This report has been up-issued to Issue 2 to correct the FCC and IC ID's.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC CFR 47 Part 15B and ICES-003. The sample tested was found to comply with the requirements defined in the applied rules.

Test Engineer(s);

G Lawler

UKAS TESTING 0141

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SECTION 1

REPORT SUMMARY

FCC Testing of the
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1.1 INTRODUCTION

The information contained in this report is intended to show verification of the FCC Testing of the SRT Marine Technology Ltd Mercury 409-0002 AIS SART to the requirements of FCC CFR 47 Part 15B and ICES-003.

Objective	To perform FCC Testing to determine the Equipment Under Test's (EUT's) compliance with the Test Specification, for the series of tests carried out.
Manufacturer	SRT Marine Technology Ltd
Model Number(s)	409-0002
Serial Number(s)	40900023120006
Number of Samples Tested	1
Test Specification/Issue/Date	FCC CFR 47 Part 15B (2011) ICES-003 (2004)
Incoming Release Date	Application Form 06 September 2012
Disposal Reference Number Date	Held Pending Disposal Not Applicable Not Applicable
Order Number Date	POR002829 19 December 2011
Start of Test	6 August 2012
Finish of Test	6 August 2012
Name of Engineer(s)	G Lawler

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1.2 BRIEF SUMMARY OF RESULTS

A brief summary of the tests carried out in accordance with FCC CFR 47 Part 15B and ICES-003 is shown below.

Section	Spec Clause	Test Description	Result	Comments/Base Standard
Idle				
2.1	15.109 and 7.1	Radiated Emissions	Pass	

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1.3 APPLICATION FORM

EQUIPMENT DESCRIPTION	
Model Name/Number	Mercury AIS SART
Part Number	409-0002
Technical Description (Please provide a brief description of the intended use of the equipment)	Search and Rescue transponder . used on board ships and in life rafts.

POWER SOURCE

☐ AC mains — State voltage

AC supply frequency (Hz)

VAC

Max Current

Hz

☐ Single phase ☐ Three phase

And / Or

☒ External DC supply

Nominal voltage V Max Current A

Extreme upper voltage V

Extreme lower voltage V

Battery

☐ Nickel Cadmium ☐ Lead acid (Vehicle regulated)

☐ Alkaline ☐ Leclanche

☒ Lithium ☐ Other Details :

6 Volts nominal.

End point voltage as quoted by equipment manufacturer 6 V

FREQUENCY INFORMATION

Frequency Range	161.975 to 162.025		MHz		
Channel Spacing (where applicable)	25 KHz				
Test Frequencies*	Bottom	161.975	MHz	Channel Number (if applicable)	AIS1
	Middle		MHz	Channel Number (if applicable)	
	Top	162.025	MHz	Channel Number (if applicable)	AIS2

If alternate test modes are available resulting in different test frequencies please specify which mode is applicable:

POWER CHARACTERISTICS

Maximum TX power	1	W		
Minimum TX power		W (if variable)		
Is transmitter intended for :				
Continuous duty			☐ Yes	☒ No
Intermittent duty			☒ Yes	☐ No
If intermittent state DUTY CYCLE				
Transmitter ON	0.024 seconds			

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ANTENNA CHARACTERISTICS				
☐	Antenna connector	State impedance		Ohm
☐	Temporary antenna connector	State impedance		Ohm
☒	Integral antenna	Gain	3	dBi

MODULATION CHARACTERISTICS			
☐	Amplitude	☐	Frequency
☒	Phase	☐	Other (please provide details):

Can the transmitter operate un-modulated? ☐ Yes ☒ No

CLASS OF EMISSION USED	
ITU designation or Class of Emission:	
1	12K5GXW
(if applicable) 2	
(if applicable) 3	
If more than three classes of emission, list separately:	

EXTREME CONDITIONS			
Extreme test voltages (Max)	V	Extreme test voltages (Min)	V
Nominal DC Voltage	V	DC Maximum Current	A
Maximum temperature	°C	Minimum temperature	°C

I hereby declare that I am entitled to sign on behalf of the applicant and that the information supplied is correct and complete.

Signature: Name: Richard McMahon

Position held: Certification Engineer Date: 06.09.12

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1.4 PRODUCT INFORMATION

1.4.1 Technical Description

The Equipment Under Test (EUT) was a SRT Marine Technology Ltd Mercury 409-0002 AIS SART. A full technical description can be found in the manufacturer's documentation.

1.5 TEST CONDITIONS

For all tests the EUT was set up in accordance with the relevant test standard and to represent typical operating conditions. Tests were applied with the EUT situated in a shielded enclosure.

The EUT was powered from a 6 V DC supply.

FCC Accreditation
90987 Octagon House, Fareham Test Laboratory

Industry Canada Accreditation
IC2932B-1 Octagon House, Fareham Test Laboratory

1.6 DEVIATIONS FROM THE STANDARD

No deviations from the applicable test standard were made during testing.

1.7 MODIFICATION RECORD

Modification 0 - No modifications were made to the test sample during testing.

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SECTION 2

TEST DETAILS

FCC Testing of the
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2.1 RADIATED EMISSIONS

2.1.1 Specification Reference

FCC CFR 47 Part 15B, Clause 15.109
ICES-003, Clause 7.1

2.1.2 Equipment Under Test and Modification State

MMSI 970460006 S/N: 40900023120006 - Modification State 0

2.1.3 Date of Test

6 August 2012

2.1.4 Test Equipment Used

The major items of test equipment used for the above tests are identified in Section 3.1.

2.1.5 Test Procedure

A preliminary profile of the Spurious Radiated Emissions is obtained up to the 5th harmonic of the EUT's highest internally generated fundamental frequency. For frequencies from 30MHz to 18GHz the EUT is placed on a test table 800mm above the ground plane. For frequencies above 18GHz, the EUT height is increased by 200mm to a height of 1000mm. This is to ensure the beam width of the measuring antenna gives sufficient vertical coverage of the EUT.

During characterisation the turntable azimuth is adjusted from 0 to 360 degrees with the measuring antenna in one polarity. It is then repeated for the other polarity. Any frequencies of interest are noted for formal measuring later. The distance from the measuring antenna to the boundary of the EUT is 3m. Above 18GHz this distance may be reduced to 1m.

During formal measurement the spectrum analyser is tuned to the frequency of the emission. The turntable azimuth is adjusted from 0 to 360 degrees to determine the point at which the maximum emission level occurs. Then the height of the measuring antenna is adjusted from a height of 1m to 4m to determine the height at which the maximum emission level occurs. Once the point of maximum emission has been determined the emission is measured. Emissions in the 30MHz to 1GHz range are measured using a CISPR Quasi – Peak detector function in a 120kHz bandwidth. Emissions in the range 1GHz to 40GHz require Peak and Average measurements. The Peak measurements are made using a peak detector with 1MHz Resolution and Video bandwidths. The average measurements employ a peak detector with a Resolution bandwidth of 1MHz and a Video bandwidth of 10Hz. If measurements are made at a 1m measuring distance, then 10dB is added to the specification limit.

2.1.6 Environmental Conditions

Ambient Temperature	20.5°C
Relative Humidity	61.0%

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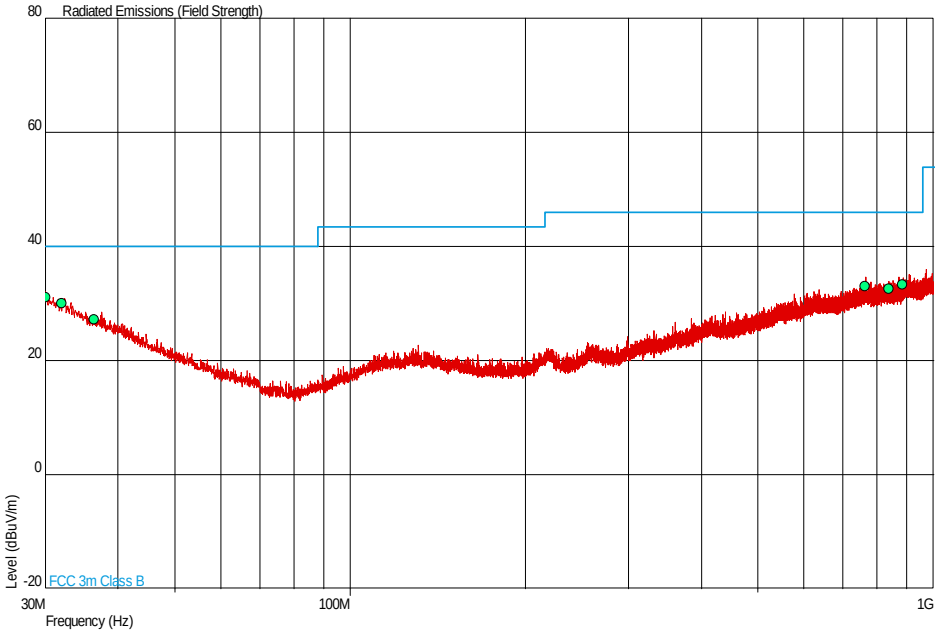
2.1.7 Test Results

Channel 1

30 MHz to 1 GHz



Frequency (MHz)	QP Level (dBuV/m)	QP Level (uV/m)	QP Limit (dBuV/m)	QP Limit (uV/m)	QP Margin (dBuV/m)	QP Margin (uV/m)	Angle (Deg)	Height (m)	Polarity	
30.039	31.1	35.9	40.0	100	-8.9	64.1	314	1.00	Vertical	
32.006	30.1	32.0	40.0	100	-9.9	68.0	8	1.00	Horizontal	
36.437	27.2	22.9	40.0	100	-12.8	77.1	102	1.00	Vertical	
763.213	33.0	44.7	46.0	200	-13.0	155.3	360	1.00	Horizontal	
838.086	32.7	43.2	46.0	200	-13.3	156.8	177	1.00	Horizontal	
883.981	33.4	46.8	46.0	200	-12.6	153.2	105	1.00	Horizontal	

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SECTION 3

TEST EQUIPMENT USED

3.1 TEST EQUIPMENT USED

List of absolute measuring and other principal items of test equipment.

Instrument	Manufacturer	Type No.	TE No.	Calibration Period (months)	Calibration Due
Section 2.1 - Radiated Emissions					
Screened Room (5)	Rainford	Rainford	1545	36	25-Dec-2013
Signal Generator	Rohde & Schwarz	SML01	1590	12	13-Apr-2013
Mast Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Antenna (Bilog)	Chase	CBL6143	2904	24	12-May-2013
Tunable Notch Filter	Wainwright	WRCD 130.0/170.0-0.05/50-5EEK	3412	-	TU
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	29-Sep-2012
9m RF Cable (N Type)	Rhophase	NPS-2303-9000-NPS	3791	12	26-Aug-2012
Tilt Antenna Mast	maturo Gmbh	TAM 4.0-P	3916	-	TU
Mast Controller	maturo Gmbh	NCD	3917	-	TU

TU – Traceability Unscheduled

3.2 MEASUREMENT UNCERTAINTY

For a 95% confidence level, the measurement uncertainties for defined systems are:-

Test Discipline	MU
Radiated Emissions	30MHz to 1GHz: ± 5.1 dB 1GHz to 40GHz: ± 6.3 dB

SECTION 4

ACCREDITATION, DISCLAIMERS AND COPYRIGHT

Product Service

4.1 ACCREDITATION, DISCLAIMERS AND COPYRIGHT

This report relates only to the actual item/items tested.

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation.

Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).