



Bundesrepublik Deutschland
Federal Republic of Germany

Bundesamt für Seeschifffahrt und Hydrographie
Federal Maritime and Hydrographic Agency



BUNDESAMT FÜR
SEESCHIFFFAHRT
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Assessment of internal / external Documents for

AIS Class A

Equipment under test: **Seatex**

Type: **AIS300**

Applying test standards: **IEC 60945 Ed.4 (2002)**

Assessment Report No.: **BSH/4543/001/4322719/14-5**

Applicant: **Kongsberg Seatex
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Hamburg, 18 May 2015
For the Federal Maritime and Hydrographic Agency

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Order: Your application for type approval
Dated: 2014-01-24

Basics of assessment:

No.	File name	Document title/ description	Test lab, accreditation
1	3885 Test report NEMKO AIS-300 EMC and environmental.pdf	Test report No. E14027.01 2014-04-14	Nemko
2	3 191625 Test report IEC62320 V2.pdf	Test Report No. 191625-3 of the base station BS600 Issue date: 2012-05-07	Nemko
3	Int_Inf_898_Kongsberg_Se atex_AIS_300.pdf	Interne Information No. 898	BSH
4	E-Mail vibration.pdf	E-mail explaining the mounting for the vibration test Dated 2015-02-17	Kongsberg Seatex
5	E-Mail vibration_response.pdf	Response to e-mail doc. 4	BSH
6	239117_02 TRF MAR for AIS300.pdf	Test report No. E14027.02 Update of doc. 1, 2015-02-19	Nemko
7	Technical report 20157 Rev 02 MPCF1-1,4 Maritime Panel Computer.pdf	EMC and Environmental testing of Maritime Panel Computer type MPCF1-10,4 manufactured by Data Respons Norge AS Report No. : 20157 Version: 2	Applica (DNV)
8	applica_903_Data_Respons _Panel_PC.pdf	Interne Information Nr. 903 BSH review of Compass safe distance test.	BSH

The document number is used in the table below as reference.



Edition:

Date	Edition	Remark	Author
2014-09-25	1	Template	Bartels
2015-02-16	2	Result of review, Transponder	S3209
2015-02-17	3	Editorial changes	Bartels
2015-05-05	4	Implemented documents 4...6	Bartels
2015-05-13	5	Result of review, MKD	S3209

Result:

The reviewed test reports 1...6 do not cover the MKD and the GPS antenna.

- For the the GPS antenna this is acceptable because the Procom GPS 4 is a well known and approved antenna.
- For the MKD the test report document 7 has been reviewed.

Enclosures:

Checklist

The Performance Check (PC) is defined in IEC 61993-2 Ed.2, section 14.1.1

Checklist Transponder: Review of external test reports – IEC 60945						
Equipment category: protected (Doc 1, page 7)						
Clause	Test title	Conditions, Requirements	Test/waiver	Doc.No W./ T.?	Remarks	Results
6	Operational checks		Test		Test is performed by BSH, Results are documented in a special test report	N/A
7	Power supply					
7.1 (4.3.1)	Extreme power supply		Test	2	Covered by radio tests IEC 61993-2 section 15 Extreme power supply performance checks have been performed in connection with 8.2.2 and 8.4.2	Passed
7.2 (4.3.2/ 5.2.3)	Excessive conditions		Test	1	Reverse polarity	Passed
7.3	Power supply short-term variation		No test		Test is performed in 10.7	N/A
7.4	Power supply failure		Test		Test is performed in 10.8	N/A
8 (4.4)	Durability and resistance to environmental conditions					
8.2.1	Dry heat Storage test	Not for protected	PC			N/A
8.2.2	Dry heat Functional test	Not for submerged Normal and high voltage	Test	2	<ul style="list-style-type: none"> Performance tests are covered by radio tests IEC 61993-2 section 15 Performance checks have been performed 	Passed
		Not for submerged Extreme low voltage	PC	1		Passed
8.3	Damp heat	Not for submerged	PC	1		Passed
8.4.1	Low temperature Storage	Portable only	PC			N/A
8.4.2	Low temperature Functional	Not for submerged Normal and low voltage	Test	2	<ul style="list-style-type: none"> Performance tests are covered by radio tests IEC 61993-2 section 15 Performance checks have been performed 	Passed
		Not for submerged Extreme high voltage	PC	1		Passed
8.5	Thermal shock	Portable only	PC			N/A
8.6.1	Drop on hard surface	Portable only	PC			N/A

8.7	Vibration	Resonance search 2 Hz to 100 Hz 0.5 Octave/min x, y and z Axis	Test X	1		Passed	
			Test Y	1		Passed	
			Test Z	1 4,5	Test without mounting kit → Note 1 <u>Retest 2015-05-05 Ba</u> See Note 1	Passed	
		Endurance test 30Hz, 1 or all resonance freq. x, y and z Axis	Test X	1		Passed	
			Test Y	1		Passed	
			Test Z	1 4,5	Test without mounting kit → Note 1 <u>Retest 2015-05-05 Ba</u> See Note 1	Passed	
8.8	Rain and spray	Exposed only	Test			N/A	
8.9	Immersion	Submerged, portable	Test				N/A
8.10	Solar radiation	Portable only	Waiver				N/A
8.11	Oil resistance	Portable only	Test				N/A
8.12	Corrosion		Test				Passed
9	Electromagnetic emission						
9.2	Conducted emissions (all equipment categories except portable)	10 – 150 kHz Bw 200 Hz	Test	1			Passed
		150 kHz – 30 MHz Bw 9 kHz	Test	1			Passed
9.3	Radiated emissions from enclosure port (all equipment categories except portable)	150 kHz – 30 MHz Bw 9 kHz, H-Field	Test	1			Passed
		30 MHz to 156 MHz Bw 120 kHz, E-Field	Test	1			Passed
		156 MHz to 165 MHz Bw 9 kHz, E-Field	Test	1			Passed
		165 MHz to 2 Ghz Bw 120 kHz, E-Field	Test	1			Passed

10	Immunity to electromagnetic environment					
10.3	Immunity to conducted radio frequency disturbance	150 kHz – 80 MHz 3 V rms, criterion A	Test	1		Passed
		Spot frequencies 2 MHz... 25 MHz 10 V rms	Test	1		Passed
10.4	Immunity to radiated radiofrequencies	80 MHz – 2 GHz 10 V/m	Test	1		Passed
10.5	Immunity to fast transients on a.c. power, signal and control lines	1 kV common mode 50 ns at 5 kHz (a.c. power 2 kV)	Test	1 6	Page 21: The lab tested with 0.5kV instead of 1kV. <u>Retest 2015-05-05 Ba:</u> The test report has been updated. Tests with 1 kV have been added to the test table.	Passed
10.6	Immunity to surges on a.c. power lines	1 kV line/ 0.5 kV earth 1.2 µs at 1/min	No test			N/A
10.7	Immunity to power supply short term variation	not applicable for d.c. powered equipment	No test			N/A
10.8	Immunity to power supply failure	3 breaks of 60 s Criterion C	Test	1	Page 24: "The communication link to the test PC has to be established by the operator." This seems to be a problem of the test environment. In the BSH tests the power breaks work without a need to re-establish the serial links manually	Passed
10.9	Immunity to Electrostatic discharge	6 kV contact discharge, 8 kV air discharge	Test	1		Passed
11	Special purpose tests					
11.1	Accoustic noise and signals		No test			N/A
11.2 (4.5.3)	Compass safe distance		Test	1, 3	The measurement by Nemko results in a CSD of 20 cm. BSH normally uses 30 cm as minimum CSD (see Doc. 3 Interne Information No. 898) Therefore we recommend using 30 cm on the type label.	Passed
12	Safety precautions					
12.1 (4.6.1)	Protection against dangerous voltages		Test	1		Passed
12.2 (4.6.2)	Electromagnetic Radiofrequency radiation		No test			N/A

12.3 (4.6.2)	Emission from visual display unit		Waiver			N/A
12.4 (4.8.3)	X-radiation		Waiver			N/A
13	Maintenance					
13 (4.7)	Maintenance		Test		Test is performed by BSH, Results are documented in a special test report	N/A
14	Equipment manuals					
14 (4.8)	Equipment manuals		Test		Test is performed by BSH, Results are documented in a special test report	N/A
15	Marking and identification					
15 (4.9)	Marking and identification		Test		Test is performed by BSH, Results are documented in a special test report	N/A

Note 1:

IEC 60945, Chap. 8.7.2 requires:

The EUT... shall be fastened to the vibration table by its normal means of support and in its normal attitude.

The lab tested the transponder **without** mounting kit. The transponder has been mounted different to the normal mounting on board. It has been fixed with strong bars which may suppress any resonance vibration of the housing.

Therefore the vibration test has to be repeated with both possible mounting kits instead of the bars.

Because with expect no significant differences in X and Y axis vibration by the different mounting we accept if only the Z axis vibration is repeated.

Retest 2015-05-05 Ba:

Kongsberg Seatex has explained the mounting conditions of the vibration test in an e-mail (Doc. 4). BSH can follow this explanation and accept the vibration test (Doc. 5).

Checklist MKD: Review of external test reports – IEC 60945						
Equipment category: Exposed (Doc. 7, page 8)						
Clause	Test title	Conditions, Requirements	Test/waiver	Doc.No W./ T.?	Remarks	Results
6	Operational checks		Test		Test is performed by BSH, Results are documented in a special test report	N/A
7	Power supply					
7.1 (4.3.1)	Extreme power supply		Test	7	24VDC	Passed
7.2 (4.3.2/ 5.2.3)	Excessive conditions		Test	7		Passed
7.3	Power supply short-term variation		No test	7	24VDC	N/A
7.4	Power supply failure		Test	7	See test 10.8	Passed
8 (4.4)	Durability and resistance to environmental conditions					
8.2.1	Dry heat Storage test	Not for protected	PC	7	+70°C	Passed
8.2.2	Dry heat Functional test	Not for submerged Normal voltage	Test	7	+55°C	Passed
		Not for submerged Extreme voltage	PC	7	+55°C	Passed
8.3	Damp heat	Not for submerged	PC	7		Passed
8.4.1	Low temperature Storage	Portable only	No test			N/A
8.4.2	Low temperature Functional	Not for submerged Normal voltage	Test	7	-25°C	Passed
		Not for submerged Extreme voltage	PC	7	-25°C	Passed
8.5	Thermal shock	Portable only	No test			N/A
8.6.1	Drop on hard surface	Portable only	No test			N/A



8.7	Vibration	Resonance search 2 Hz to 100 Hz 0.5 Octave/min x, y and z Axis	Test X	7, Pages 54, 55	The vibration test has been performed only flush mounted. Therefore the certificate requires a limitation for the installation on board: The panel PC must be installed flush mounted. A mounting with bracket is not allowed	Passed
		Endurance test 30Hz, 1 or all resonance freq. x, y and z Axis	Test Y			
			Test Z			
			Test X			
			Test Y			
			Test Z			
8.8	Rain and spray	Exposed only	Test	7, Pages 66, 67	The rain and spray test has been performed only flush mounted. The rain has been applied only on the display side. Therefore the certificate requires a limitation for the installation on board: The panel PC must be installed flush mounted. All parts except screen and frame must be kept protected from water.	Passed
8.9	Immersion	Submerged, portable	No test			N/A
8.10	Solar radiation	Portable only	No test			N/A
8.11	Oil resistance	Portable only	No test			N/A
8.12	Corrosion		Test	7, Pages 66, 68	In the test report there is no information about the mounting. Assuming that the mounting was the same as in test 8.7 and 8.8 the certificate requires a limitation for the installation on board: The panel PC must be installed flush mounted. All parts except screen and frame must be kept protected from corrosive environment.	Passed

9 Electromagnetic emission						
9.2	Conducted emissions <i>(all equipment categories except portable)</i>	10 – 150 kHz Bw 200 Hz	Test	7		Passed
		150 kHz – 30 MHz Bw 9 kHz	Test	7		Passed
9.3	Radiated emissions from enclosure port <i>(all equipment categories except portable)</i>	150 kHz – 30 MHz Bw 9 kHz, H-Field	Test	7		Passed
		30 MHz to 156 MHz Bw 120 kHz, E-Field	Test	7		Passed
		156 MHz to 165 MHz Bw 9 kHz, E-Field	Test	7		Passed
		165 MHz to 2 Ghz Bw 120 kHz, E-Field	Test	7		Passed
10 Immunity to electromagnetic environment						
10.3	Immunity to conducted radio frequency disturbance	150 kHz – 80 MHz 3 V rms, criterion A	Test	7		Passed
		Spot frequencies 2 MHz... 25 MHz 10 V rms	Test	7		Passed
10.4	Immunity to radiated radiofrequencies	80 MHz – 2 GHz 10 V/m	Test	7		Passed
10.5	Immunity to fast transients on a.c. power, signal and control lines	1 kV common mode 50 ns at 5 kHz (a.c. power 2 kV)	Test	7		Passed
10.6	Immunity to surges on a.c. power lines	1 kV line/ 0.5 kV earth 1.2 µs at 1/min	No test			N/A
10.7	Immunity to power supply short term variation	not applicable for d.c. powered equipment	No test			N/A
10.8	Immunity to power supply failure	3 breaks of 60 s Criterion C	Test	7		Passed
10.9	Immunity to Electrostatic discharge	6 kV contact discharge, 8 kV air discharge	Test	7		Passed
11 Special purpose tests						
11.1	Accoustic noise and signals		Waiver	7		N/A
11.2 (4.5.3)	Compass safe distance		Test	7, 8	The compass safe distance measurement has been reviewed by BSH (Doc. 8)	Passed



12		Safety precautions				
12.1 (4.6.1)	Protection against dangerous voltages		Test	7		Passed
12.2 (4.6.2)	Electromagnetic Radiofrequency radiation		No test			N/A
12.3 (4.6.2)	Emission from visual display unit		Waiver	7		N/A
12.4 (4.8.3)	X-radiation		No test			N/A
13		Maintenance				
13 (4.7)	Maintenance		Test		Test is performed by BSH, Results are documented in a special test report	N/A
14		Equipment manuals				
14 (4.8)	Equipment manuals		Test		Test is performed by BSH, Results are documented in a special test report	N/A
15		Marking and identification				
15 (4.9)	Marking and identification		Test		Test is performed by BSH, Results are documented in a special test report	N/A