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Appendices

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Estonia R60 Base Stations

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DOCUMENT CHANGE RECORD

Issue	Change order	Date	Pages affected	Motive for and information on the change
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1 SCOPE

This document provides a Site Acceptance Test (SAT) procedure of the R60 VDES Base Station, which is to be delivered to the Estonian Transport Administration. The document only covers system tests functionalities of AIS even though the R60 also supports ASM and VDE.

1.1 Identification

This document covers the configuration of the test environment, the test procedure and acceptance criteria to be performed.

1.2 System Overview

The R60 VDES Base Stations will be installed in an existing AIS system.

1.3 Document Overview

The purpose of this document is to describe the test environment, test procedures and acceptance criteria used to verify the functionality of the system.

The document is focusing on system functionality, thus one test case may cover functionality in several different components.



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2 TEST ENVIRONMENT

The tests shall be performed with the system configuration and hardware according to Figure 2-1.

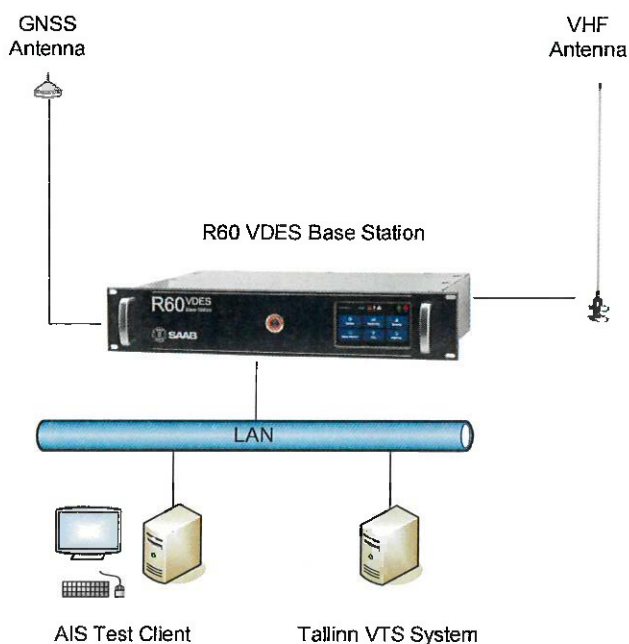


Figure 2-1, SAT environment test system

In the tests, the following hardware/software will be used:

- R60 VDES Base Station
- GNSS Antenna
- VHF Antenna
- AIS Test Client
- Tallinn VTS System



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2.1 R60 VDES Base Station including antennas

The R60 VDES Base Station to be used during the test shall be properly installed and connected to one GNSS Antenna, having clear view to the sky so satellites can be received, and one VHF Antenna, having coverage towards Sea.

2.2 AIS Test Client

In order to perform the tests an AIS Test Client, with the possibility to send and receive AIS messages, is needed. Saab will provide such standalone application, which can be installed in any Windows PC connected to the R60 VDES Base Stations. However, any AIS Test Client with the above possibility can be used during the tests.

2.3 Tallinn VTS System

In order to perform some tests the R60 shall be integrated into the existing Tallinn VTS System, which is the Saab MaritimeControl System.

For this to work a temporary license of the Saab MaritimeControl System will be given to the Estonian Transport Administration. The return of the license is to be agreed between Saab and the Estonian Transport Administration.



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3 DEFINITION OF TEST CASES

The test cases define the tests that shall be performed. Each test is specifying the functions to be verified, the different steps to be performed and the acceptance criteria for each step. The criteria's for acceptance is:

- P (Pass) for accepted test result
- F (Fail) with comment for not accepted test result
- NA (Not Applicable) if a test case for some reason is not applicable, for example if the test case could not be performed due to circumstances not under control by Saab.

If a comment is given, the comment shall be given in appendix A1, together with the reason and if possible with a proposed solution for the comment.



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4 SITE ACCEPTANCE TEST PROCEDURE

4.1 HW and SW inventory check

Item	Description	Test result
1	HW and SW inventory check	
1.1	Action: Check for R60 VDES Base Station. Criteria for accepted test: Verify that 1 R60 VDES Base Station with accessories are present.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
1.2	Action: Check for GPS/GNSS Antenna. Criteria for accepted test: Verify that 1 GPS/GNSS Antenna is present.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
1.3	Action: Check for VHF Antenna. Criteria for accepted test: Verify that 1 VHF Antenna is present.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
1.4	Action: Check for AIS Test Client application. Criteria for accepted test: Verify that 1 AIS Test Client application is present in a PC.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA



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4.2 R60 VDES Base Station

2	R60 VDES Base Station – General		
2.1	Action: Startup web-interface and connect to the base station in Monitor mode. Criteria for accepted test: Verify that the program is starting up correctly, and connection is OK.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
2.2	Action: Select Alarm tab in the web-interface. Wait until all alarms have verified the state. Criteria for accepted test: Check that all alarms are set to green, N/A or Failed as expected if any.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
2.3	Action: Select the Status tab and check GNSS status. Criteria for accepted test: Check that at least 5 satellites are used.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
2.4	Action: Check Position Reports tab. Criteria for accepted test: Check that at least one ship is in the list, and that the plot is showing a relevant traffic scheme according to the location of the base station.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
2.5	Action: Select the Data Log tab. Criteria for accepted test: Verify that AIS data are received (VDM sentences).	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
2.6	Action: Select the VDL Link Map. Criteria for accepted test: Verify that is possible to see a graphical presentation with information of the VHF Data Link.	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	



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3	R60 VDES Base Station – Alarms		
3.1	<p>Action: Use the web-interface and connect to the base station in Monitor mode and select Alarm tab. Disconnect the VHF antenna cable from the base station.</p> <p>Criteria for accepted test: Verify that either Antenna VSWR or TX alarm is set to red in Alarm tab in the web-interface.</p>	<input type="checkbox"/> P <input type="checkbox"/> F <input checked="" type="checkbox"/> NA	
3.2	<p>Action: Reconnect the antenna cable to the base station.</p> <p>Criteria for accepted test: Verify that all alarms are set to green in Alarm tab in web-interface.</p>	<input type="checkbox"/> P <input type="checkbox"/> F <input checked="" type="checkbox"/> NA	
3.3	<p>Action: Disconnect the GPS antenna cable to the base station.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Verify that the Sensor Position in Use alarm is set to red in Alarm tab in web-interface. This is not seen if fixed (surveyed) position source is used. - Verify that the Clock alarm is set to red in Alarm tab in the web-interface. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	
3.4	<p>Action: Reconnect the GPS antenna cable to the base station.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Verify that all alarms are set to green in Alarm tab in web-interface. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA	



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4	R60 VDES Base Station – Slot / Data Link Management	
4.1	<p>Purpose: Configuration of autonomous transmissions of Data Link Management Commands (FATDMA set-up)</p> <p>Action: Configure the R60 to transmit Data Link Management message via web-interface.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Reconnect and read back parameters and verify that they have been set in web-interface. - In the VDL Link Map, in web-interface, verify that is possible to see a graphical presentation with information of the configured VHF Data Link. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
5	R60 VDES Base Station – Aids to Navigation (AtoN)	
5.1	<p>Purpose: Configuration and transmission of AtoN</p> <p>Action: Configure the R60 to transmit AtoN message via web-interface.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Reconnect and read back parameters and verify that they have been set in web-interface. - In the VDL Link Map, in web-interface, verify that is possible to see information of the AtoN. - In another application, for the example the AIS Test Client, verify that is possible to see information of the AtoN. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA



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6	R60 VDES Base Station – Local Storage of AIS data	
6.1	<p>Purpose: Configuration and using of Local Storage of AIS data.</p> <p>Action:</p> <ul style="list-style-type: none"> - Enable local storage. - Make sure R60 knows the UTC time. - The VTS Tallinn System is not connected to the R60. - Select the Status tab and check Local storage status. <p>Criteria for accepted test:</p> <p>Make sure that the Used size increases.</p>	<p><input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA</p>
6.2	<p>Purpose: Configuration and using of Local Storage of AIS data.</p> <p>Action:</p> <ul style="list-style-type: none"> - The VTS Tallinn System is connected to the R60. - Select the Status tab and check Local storage status. <p>Criteria for accepted test:</p> <p>Make sure that the Used size decreases.</p> <p>Note: When the test is done, disable local storage in the R60.</p>	<p><input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA</p>



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4.3 AIS Test Client

7	AIS Test Client – Receiving of vessel position reports and static messages	
7.1	<p>Action: Connect the AIS Test Client to the R60 VDES Base Station.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Verify that the AIS Test Client receives position reports from vessels. - Verify that the AIS Test Client receives names of vessels (could take up to 6 minutes) 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
8	AIS Test Client – Receiving of base station reports	
8.1	<p>Action: Verify that Message 4 is properly configured to be sent out by the R60 VDES Base Station.</p> <p>Criteria for accepted test:</p> <p>Verify that the AIS Test Client receives base station reports with MMSI TBD.</p>	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
9	AIS Test Client – Sending and receiving of addressed SRM messages	
9.1	<p>Action: From AIS Test Client send the addressed SRM message: "TEST ADDRESSED MESSAGE FROM VTS TALLINN" to a vessel.</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Verify that the message is received by the vessel. - Verify that AIS Test Client receives an acknowledgement. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA
9.2	<p>Action: From the vessel reply to the received addressed SRM message i.e. send back the addressed SRM message: "TEST ADDRESSED MESSAGE TO VTS TALLINN"</p> <p>Criteria for accepted test:</p> <ul style="list-style-type: none"> - Verify that the message is received by the AIS Test Client. - Verify that the vessel receives an acknowledgement. 	<input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA



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10	AIS Test Client – Sending and receiving of broadcast SRM messages	
10.1	<p>Action: From AIS Test Client send the broadcast SRM message: “TEST BROADCAST MESSAGE FROM VTS TALLINN”.</p> <p>Criteria for accepted test:</p> <p>- Verify that the message is received by some vessel.</p>	<p><input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA</p>
10.2	<p>Action: From a vessel reply to the received broadcast SRM message i.e. send back the broadcast SRM message: “TEST BROADCAST MESSAGE TO VTS TALLINN”</p> <p>Criteria for accepted test:</p> <p>- Verify that the message is received by the AIS Test Client.</p>	<p><input checked="" type="checkbox"/> P <input type="checkbox"/> F <input type="checkbox"/> NA</p>



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A1 SITE ACCEPTANCE TEST (SAT) PUNCH LIST

Any incomplete work or non-conformances shall be recorded on the SAT punch list and categorized as follows:

- a) To be cleared on the spot, SAT to continue after rectification.
- b) Ongoing rectification during SAT.
- c) Modifications to be made after SAT, retests are necessary.
- d) Modifications to be made after SAT, no retests are necessary.

Punch list:

Item	Description	Responsible	Type	Complete
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				
16				
17				
18				
19				
20				
21				
22				



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A2 SITE ACCEPTANCE TEST (SAT) CERTIFICATE

ACCEPTED

NOT ACCEPTED

Customer	Estonian Transport Administration		
Project	Estonia R60 Base Stations	Project no.	34059 / Sales Contract Number 3.2-4/22/1741-1
Plant/Unit	R60 VDES Base Station		
Venue of SAT	Tallinn, Estonia	SAT finished on	2022-09-22

Persons in charge / Signatures:

	Company/Department	Name	Signature
Customer	Estonian Transport Administration	Ants-Kristjan Masing	
End-customer	Same as Customer	N/A	N/A
Vendor	Saab AB (publ) TransponderTech	Niklas Stjärnskog	

No punch list items were found

Punch list items were found See remarks below or list attached

Comments and Remarks

During the tests Tx alarm was seen in the R60 base station. Most likely, it is the VHF antenna installation causing this alarm since the antenna cable length is approx. only 2 meters. Two R60 base stations have been tested with the same result.