



Project: **VDR & S-VDR**

Client: **Netwave Systems BV**  
**Lichtenauerlaan 110**  
**3062 ME Rotterdam**  
**The Netherlands**

Office: **Rotterdam**

Clients Order Number:

Date: **10 September 2006**

Order Status: **Complete**

Inspection Dates

First: **19 July 2006**

Final: **03 August 2006**

This certificate is issued to **the above named client in order to certify that the undersigned Surveyor did attend the Works of TNO Efectis, at Rijswijk and TS Techniek BV, at Pijnacker on the dates shown for the purpose of inspecting and witness testing on the undermentioned equipment:**

The equipment is a VDR & S-VDR on which the following tests have been conducted:

- High Temperature tests according to IEC61996/ED56
- Low temperature according to IEC61996/ED56
- Deep-sea immersion tests according to IEC61996/ED56

The scope is only limited to witnessing tests as described on Report 0606882/1a and reporting the results. For further details see attached report.

### General

By request and on behalf of:

NetWave Systems BV  
Lichtenauerlaan 110  
3062 ME Rotterdam  
The Netherlands

(Contact: Mr. R.J. Post, managing director)

Lloyd's Register, by means of Mr. Peter Sebrechts, witnessed the tests of Voyage Data Recorder, hereafter called VDR, at two locations:

TNO Efectis  
Lange Kleijweg  
Rijswijk  
The Netherlands

(Contact: Mr. Robert Scheepe)

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- High Temperature tests according to IEC61996/ED56
- Low temperature according to IEC61996/ED56
- Deep-sea immersion tests according to IEC61996/ED56

TNO Efectis is an accredited (fire) test laboratory

TS Techniek BV  
Boezemweg  
Pijnacker  
The Netherlands

- Penetration tests

Lloyds Register witness: Mr. Peter Sebrechts,

Performance criteria

IEC61996: Shipborne voyage data recorder (VDR)

- Performance requirements
- Methods of testing and required test results

5.4.2 Survival following an incident

#### Witnessing

Our witnessing focussed on confirmation and compliance to the

- correctness of the testing environment
- testing methodology undertaken
- temperature and forces the EUTs were subjected to
- test results & documentation
- EUTs compliance to the IEC61996 Performance Standards for VDR

Specific details of the tests were furthermore carried out according to the document NW4800-PTM120406-RP that described the EUT and specifics of the testing methodology where, arranged by NetWave, agreed by BSH in advantage.

The tests were carried out in conjunction with the manufacturer's application for the VDR's Wheelmark certificate to be issued by Bundesamt für Schifffahrt und Hydrographie in Hamburg, Germany.

The task of Lloyd's Register in this test schedule was to witness the tests and verify compliance to the test procedure according IEC 61996 First edition 2000-07 and ED56A 25 November 1997, in specific limited to the tests mentioned in document NW4800-PTM120406-RP.

For the tests, three Units used:

EUT 1 serial number NW4800-0511-8,  
EUT 2 serial number NW4800-0511-9,  
EUT 3 serial number NW4800-0511-11

Data verification method

The VDR data storage consists of 2 memory volumes, defined as USB 1 and USB 2. The actual data size of each USB turned out to be approximately 1,9GB or around 95% of the total capacity. The data – which was shown to be actual recorded data by means of playing back part thereof (IEC 61996: 6.1.13.2 Test data to be pre-loaded into the final recording medium) - which is stored on the VDR/FRM is burned on two DVD's, one DVD for USB 1 connection and one for USB 2 connection. The DVD is marked with the EUT identification. From the start of the tests until the end of the test and the full verification process, the DVD was kept in the custody of Lloyds Register. The manufacturer did not have access thereto since these were also removed from the test facilities in-between the tests.

In between tests i.e. during the cooling down period or during the deep water immersion tests it was agreed and confirmed by TNO that the EUT were in the custody of TNO and that the manufacturer did not have access thereto.

Before any test is carried out, the data stored on the VDR capsule (as the Final Recording Medium in IEC61996- 3.1.3 (A.861/4.3)) is copied to a new DVD and verified with the original on the FRM.

To verify the data a program called ExamDiff Pro – with CRC check, binary enabled - is used to compare the stored data on the CDROM to the FRM on a bit-by-bit basis.

Part of the data was played back.

**Tests performed:**

The following tests which are carried out at TNO Efectis.

**EUT Module 1:**

Test 1, date 19-07-2006

Low temperature test (complete Capsule, deckmount with CPU, release mechanism and cable)

Acc. To: IEC61996 Chapter 6.1.13.6 and requirement of ED56A Chapter 5.3.2 e Low temperature fire test for 10h at 260 °C.

The capsule was allowed to cool naturally. No mechanical damage to the capsule or the release mechanism was observed. The ULB (steel dummy underwater locator beacon) did not detach from the assembly.

Test 2, start date 01-08-2006: FRM retrieved from within capsule.

IEC61996 Chapter 6.1.13.8 and requirement of ED56A Chapter 5.3.2 f Deep-sea immersion test for 24h at 600Bar.

Verification date 02-08-2006: after test 1 and test 2 the stored data on the VDR is compared with original data stored on DVD.

**Test result:**

The result after the verification the data was 100% equal, and is found satisfactory.

**EUT Module 2:**

After calibration of burner capacity by means of the calorimeter methodology as described in ED56A

Test 1 date 19-07-2006: High temperature test (complete Capsule, deckmount with CPU, release mechanism and cable).

acc. to: IEC61996 Chapter 6.1.13.6 and requirement of ED56A Chapter 5.3.2 d High temperature fire test for 1h at 1100 °C.

The capsule was allowed to cool naturally. No mechanical damage to the capsule or the release mechanism was observed. The ULB (steel dummy underwater locator beacon) did not detach from the assembly.

Test 2 start date 02-08-2006: FRM retrieved from within capsule.

IEC61996 Chapter 6.1.13.8 and requirement of ED56A Chapter 5.3.2 f Deep-sea immersion test for 24h at 600Bar.

Verification date 03-08-2006:

After test 1 and test 2 the stored data on the VDR is compared with original data stored on DVD.

**Test result:**

The result after the verification the data was 100% equal, and is found satisfactory.

**Remarks:**

- The data was demonstrated to be replaying correctly by means of the Replay software provided by the manufacturer.
- Particular attention was paid to the correct (local volumes vs. via USB cable) storage volumes of which the data was retrieved to be compared.

**Penetration tests**

The tests were carried out at TS Techniek BV at Pijnacker:

**Test Method:**

A weight is raised above the VDR capsule and the VDR capsule is laid in a bed of Redhill 65 sand, mounted on a steel plate according to ED56.

The test is carried out according IEC61996 Chapter 6.1.13.5 and requirement of ED56A Chapter 5.3.2 b Penetration resistance. The crate was compliant to document NW4800-PTM120406-RP.

**EUT Module 3:**

Three tests are carried out:

Test 1 date 02-08-2006:

The weight is dropped on the top of the capsule.

Test 2 date 02-08-2006:

The weight is dropped in the middle on the side of the capsule.

Test 3 date 02-08-2006:

The weight is dropped on the clamp of the capsule.

Verification date 08-08-2006:

After test 1, test 2 and test 3 the stored data on the VDR is compared with original data stored on DVD.

**Test result:**

After each test the capsule is visual inspected and as far as could see there were no cracks on the capsule. The result after the verification the data was 100% equal, and is found satisfactory.

For transparency reason the following was noted as stated per:

Quote "6.1.13.9 Required results of 6.1.13.4 to 6.1.13.8 (IEC 61996)

After completion of the test sequences, all the release mechanisms shall function according to the appropriate specifications. Repairs to the final recording medium shall be minimal." Unquote

Observation: There were no repairs carried out

Quote "After completion of the tests, the stored data shall be retrieved following the manufacturers instructions, which may include error correcting." Unquote

Observation: No error corrections took place

Quote "Repairs to the final recording medium shall be minimal." Unquote

Observation: There were no repairs to be undertaken

Quote "For the purposes of playback, the final recording medium may be removed from the EUT and installed into standard replay equipment as supplied by the recorder manufacturer. Recordings shall meet the requirements of the performance test specification as set out in 6.1.1.3 with at least 99 % of the data being recoverable." Unquote

Observation: 100% of the data was recoverable and verified to be correct

Quote "Thermal, mechanical or corrosive damage to the recording medium incurred during the test that results in the loss of data, shall constitute a failure." Unquote

Observation: Thermal, mechanical or corrosive damage to the FRM was not observed.

P.J.Sebrechts  
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

A handwritten signature in black ink, appearing to read 'P.J. Sebrechts', with a horizontal line underneath it.