

Marine Accident Investigators' International Forum

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MAIIF Advisory – 01/2014

The use of Voyage Data Recorders and Simplified Voyage Data Recorders for assisting a marine safety investigation

1. At the 22nd meeting of the Marine Accident Investigators' International Forum (MAIIF) in October 2013, concerns were expressed at the number of reliability and operational issues being encountered with Voyage Data Recorders (VDR) and Simplified Voyage Data Recorders (SVDR). These include:
 - Incorrect installation
 - Commissioning and annual performance test issues
 - Lack of data due to system malfunctions
 - Operating errors and inaccurate downloads
 - Incomplete data due to replay software and interface problems
 - Inaccurate data
 - Poor quality data
 - Lack of crew familiarity
 - Hardware failures
 - Unreliable playback software
 - Violations of SOLAS requirements

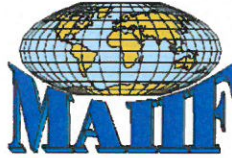


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2. A more detailed explanation of these problems is provided at the Annex to this Advisory Note.
3. It is vital for the enhancement of safety that the shipping industry, Flag States and their Authorised Representatives (ARs) are provided with clear and unambiguous guidance to ensure that the highest reliability ratio for VDRs can be attained.
4. MAIIF requests that ship operators, Flag States and ARs:
 - a. Ensure that ships' Safety Management Systems include VDR operating instructions within their emergency response procedures;
 - b. Carry out regular inspections between Flag State or ARs/IACS audits and surveys, to ensure that VDRs/SVDRs are properly functioning;
 - c. Implement training and drills to ensure that bridge teams are familiar with the use of the VDR or SVDR;
 - d. Ensure that each vessel is equipped with the appropriate VDR/SVDR technical documentation; and
 - e. Ensure that each vessel is equipped with the appropriate playback software.
5. This will serve to improve the reliability of VDRs and SVDRs and ensure all crews are familiar with the use of these systems in the event of an accident. The outcome will ensure more timely and enhanced safety investigations and, over time, improve safety, leading to fewer casualties and cost savings.

Captain Steve Clinch
Chairman
Marine Accident Investigators' International Forum

5 March 2014



Annex to MAIIF Advisory – 01/2014

1. Of over 170 VDR data sets interrogated, 90% had issues involving archiving data, downloading data and data sets.

2. Common Issues

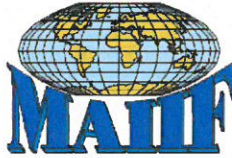
- VDR installed and signed off by class with issues, including:
 - Non-Type Approved GPS units connected;
 - Missing configuration files;
 - Incomplete configuration files;
- Un-configured replay software:
 - Sensor calibration and setup information missing;
 - Unable to understand interfaced equipment e.g. engine order and responses.

3. Audio

- Poor quality.
- Systems tested in sterile non-operational environment, e.g. dry dock, no engines or fans running, tested by use of loud speech 'testing....testing....testing' instead of normal speech in normal conditions.

4. Radar

- Radar image recorded not from the radar in use at the time of the incident.
- Radar image squashed/misshapen - interface is not capturing the image correctly.
- Radar interface failed.



5. Annual Performance Test (APT)

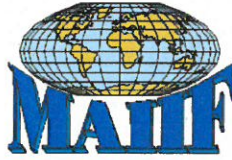
- Not carried out correctly or missed.
- Service engineers do not check for newly installed or replaced equipment that needs to be connected to the VDR, e.g. BNWAS.
- Systems being repaired at APT as crew have not informed owner that the VDR is not working correctly.
- Crew do not know that the VDR is not working correctly.
- APT service engineer has fixed a problem but has not considered the reason for the fault.
- Fault fixed by restarting the VDR or replacing parts but the system fails a few days after the APT. When this occurs, either the crew leave it in a non-operational condition or when they come to save the data after an incident they realise it's not working.

6. Ships' staff

- Lack of training and understanding of operation, archiving and/or how data is extracted from the VDR.
- Not uncommon to have to talk the master through the download or archiving procedure.
- Some systems tampered with by crew, e.g. removable drive replaced with empty disk.

7. Data Archiving

- Methods of archiving vary greatly between manufacturers.
- Crew do not read archive instructions.
- Crew do not read the displays when hitting the 'Save data' button (with some systems you have to keep your finger pressed for 10 sec, they do not read info; they just press the button briefly).



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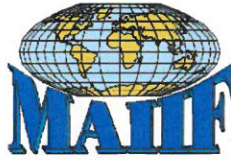
- No replacement drives available once the removable disk has been removed.
- Some older systems require a specific type of DVD RAM to export data.
- Some systems have a limited number of 'Save' functions so data can be overwritten if the 'Save' data button is pressed again.

8. Data Export

- Export function not working correctly. The user method may not be the method the APT service engine uses when checking the data so the failure may not be discovered until there is an accident.
- Some VDRs require networking with a laptop to export data.
- Incorrect published IP addresses.
- Government authorities may not have administrative rights to network their laptops.
- Some systems require a configuration file from the manufacturer before networking to export data.

9. Post-incident data

- Incomplete data being sent, configuration files and data missing.
- Data being removed, e.g. in one investigation 2 minutes of audio was missing from all 4 audio channels.
- Data not exported, just sections copied and pasted out. Replay software cannot recognise without full structure.
- Radar images only exported every 1 minute.
- Once exported, if files are renamed to indicate the ship and the accident data then the replay software will not recognise the data.
- In the case of one manufacturer, if data is copied on to a disk you have to transfer it on to a compact flash card for the replay software to recognise it.



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- Data sent on multiple DVDs needs to be rebuilt in to one file before replay software will work.

10. Data replay

- Some systems do not have a replay function only a data conversion utility.
- Data missing, e.g. GPS, AIS, Heading etc.
- Replay software compresses audio.
- Conning pages not configured.
- Replay software crashing.
- Replay software timing out if trying to load large time span of data.
- Some replay software not 'backwards compatible', have to have multiple versions installed.
- Replay software has to match the VDR recording software version.
- Some systems only work on Windows 2000, or XP and are not Win 7 64 bit compatible.
- Limited in data window selection, you may want to see Radar and Engine orders and responses but they are on different tabbed pages.
- Unable to separate or isolate audio channels.
- Time of recording not synchronized with UTC.
- If configured, prone to human error and variables, e.g. Port engine order is in fact Stbd engine order.
- Analogue to digital interfaces not calibrated correctly but replay leads you to believe they are, and this leads to the user assuming the data, as displayed, is correct.



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- No configuration information for proprietary NMEA sentences, e.g. fire alarm systems, engine and bow thruster systems. VDR regulations state the data must be recorded but no information on how to understand the data.

11. Data conversion export

- Some manufactures have misinterpreted the IEC 61996 Annex C naming protocol for the exported data files.
- Some export tools will export individual serial channels, meaning the NMEA data is split between multiple files.

