

## IACS addresses ship data quality challenges

### Managing data integrity in Industry 4.0

- By R. Srinivas, Cyber Systems Panel Chair, International Association of Classification Societies (IACS)

**T**he maritime industry is digitalising to increase operational efficiency and to meet decarbonisation and zero emissions challenges.

Technological advancements in the Internet of Things, networking and high-speed data communication have helped to increase the adoption rate of digitalisation.

System integration and data sharing with multiple processes and stakeholders and use of advanced data analytics is the future.

Ships are - albeit slowly - moving towards datacentric operations as more and more data-based control systems and applications are employed on board ships.

The importance of data quality is increasingly being recognised with the acceptance that low quality data can have a detrimental effect on decision making processes, due to inaccurate analytics.

It is vital to ensure that data is fit to serve its intended purpose and that the desired quality of data is maintained throughout the data cycle.

Data quality is a critical attribute which provides a measure of the condition of data and refers to the degree to which data meets the specific needs of various business and/or operational scenarios.

The level of data quality will affect the performance, dependability, and safety of onboard systems, and can have an impact on the accuracy of decisions taken based on data.

Data quality problems can emerge anywhere in the data flow pipeline, from master data to data used by a software solution.

### Addressing quality challenges

To address data quality challenges and to provide the maritime industry with a generic superior method and approach on how to determine the data quality requirements for a given application, IACS initiated development of a Recommendation on ship data quality.

The Recommendation will cover data generated on board vessels, or received from other sources, and used for various functions.

This Recommendation, through a review of various ISO and industry standards on the principles of data quality management, will describe a process to determine the quality of data generated on board vessels, or received from other sources, and used for various functions such as performance optimisation, condition-based maintenance, system diagnos-

tics, fault prediction, telemetry, or remote monitoring.

As well as qualifying the data quality, it is important that data collectors utilise appropriate dimensions, also known as characteristics.

Noting that there are multiple dimensions to choose from and that they could be specific to an area of application, the Recommendation aims to provide guidance on this aspect through suggested dimensions based on a data lifecycle, while considering the key elements of a data quality lifecycle, such as data identifica-

tion, data acquisition, data storage, data integration and data processing.

The Recommendation also aims to address data quality verification and validation, data value checks (e.g. range checks), data consistency checks (e.g. keeping information uniform as it moves across a network and between various applications), data semantics checks (e.g. verifying how closely data represent an event, concept, or object in the real world), and more.

The Recommendation is in an advanced stage of development and is scheduled for release by Q2 2024.

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#### About the author :

Mr R.Srinivas is the Chairman IACS Cyber Systems Panel and also Chairman of IACS Joint Industry Working Group on Cyber systems. He is working as Vice President & Senior Principal Surveyor at Indian Register of Shipping (IRS) and is heading the Electrical and control systems department in IRS plan approval division.

Mr Srinivas specialises in control and automation systems, System integration, Maritime Cyber risk management, failure mode effect analysis and Digitalisation of ship systems. Mr. Srinivas has more than 40 years of Maritime experience.

He has 13 years of experience in shipbuilding and was in charge of installation, commissioning and testing of electrical, control, automation, navigational and communications systems on board.

He has 12 years' experience in ship designs and was involved in the preparation of class drawings, production drawings and also headed various consultancy projects for shipyards and ports in automation, networking & VTMS. He is with IRS for more than 14 years.

