CIMAC
INTERNATIONAL COUNCIL ON COMBUSTION ENGINES

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CIMAC Position Paper

Cyber Security and Related Standards

The first edition of this CIMAC Position Paper was approved by the members of the CIMAC WG15 'Control & Automation' at its meeting on April 29th, 2021.

1 Objective

The CIMAC Controls & Automation working group consists of experienced stakeholders representing suppliers, OEMs, ship operators or classification societies.

This statement has been made to update the marine industry on how we, as specialists, see the recent interest in Cyber Security and the question of which standard to follow within the marine industry.

2 The Issue

In recent years, there has been an increasing amount of reported incidents related to cyber security breaches, with negative impacts on the business performance and safety of marine vessel operation. This has naturally driven a general discussion around how to address cyber security in a marine industry context and what are the relevant standards that should be followed.

While cyber security is currently addressed by basically all regulatory bodies, there is still not a consensus on how sub-suppliers and OEMs should consider cyber security in their products. At the same time, there is a plethora of various standards for cyber security outside the marine industry.

It is important to understand that to make a vessel more resilient against cyber threats, the starting point is the vessel. Depending on the structure and setup of the vessel, the required solutions and their implementation are different. Consequently, a system comprising of “cyber secure” elements is not cyber secure by itself, as it depends on how these elements are integrated.

It is not possible to design an absolutely cyber secure component or system in a strongly interconnected surrounding. Every interface to other technical systems and every interaction with human users impose a certain security risk. Moreover, since cyber security threats are evolving continuously, system updates need to be considered over the entire lifetime of the vessel. Thus, an appropriate level of cyber security can only be achieved in a collaboration of all parties from the component suppliers up to the vessel operator.

3 Recommendation

In an effort to increase the alignment amongst classification societies, ship owners, shipyards, OEM’s and sub-suppliers., CIMAC as an organization have decided to endorse the IEC 62443 standard on cyber security for any marine project and installation.

The IEC 62443 standard is a comprehensive set of recommendations for defending industrial networks against the cyber-security threats. It provides a systematic and practical methodology to assess the risks and threats of the considered systems and enables the stakeholder to make an informed decision on how to address those risks and threats. The terminology, policies and procedures sections can be referenced to provide awareness on system cyber security issues also to users without a technical background on IT systems.

For suppliers, IEC 62443 provides a good framework for security focused component and system development. It covers especially the area of automation and control systems and includes viable requirements on operator, system and component level. In a stepwise approach it provides design guidelines and risk mitigation tools to reach specific security levels.

As a highly versatile standard, IEC62443 has been adopted by numerous industries. In the meanwhile, all major marine classification societies have established cyber security rules based on IEC 62443. In this context, the International Association of Classification Societies (IACS) is working on unified requirements.

CIMAC officially supports IACS and other organizations with expertise from different CIMAC working groups.

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CIMAC e. V.
Lyoner Strasse 18
60528 Frankfurt
Germany

President: Prof. Dr. Donghan, Jin
Secretary General: Peter Müller-Baum

Phone +49 69 6603-1567
E-mail: info@cimac.com

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