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THE POLISH REGISTER OF SHIPPING IN THE SAFETY SERVICE OF THE POLISH NAVY SHIPS – EXPERIENCE AND POTENTIAL

PRS (the Polish Register of Shipping S.A.) is an independent expertise company acting on the international market for over 85 years. The origins of our association were connected with the classification of inland navigation vessels and shipbuilding and navigation, which are still dominant areas of our activity; however, at present, PRS provides services in many fields, including those not related to the ships. Dynamic response to the market's current needs and systematic introduction of alterations aimed at ensuring the highest level of the offered services, teamwork and commitment of our employees to entrusted tasks allowed us to become a pioneer in shaping innovative and adequate solutions in every economy sector.

Cooperation with the Polish Navy and the Polish Border Guard is one of the pillars of our Company's branch. This activity is based on long-term experience and broad working relations. The formal framework of our cooperation has been defined in the Cooperation Agreement signed on 6 January 1988 by PRS and the Ministry of Defense (MoD).

The signing of the above Agreement, essential for mutual relations, brought a new impulse to developing safety standards for naval ships. It allowed them to share experience in many fields related to navigation and maritime safety at sea. The framework program of the cooperation, included in periodically updated mutual agreements (the current Cooperation Agreement is dated 4 March 2005 and has not been terminated by any Party up to now), covers the whole sphere of shipbuilding, maritime and harbour infrastructure, maritime engineering, navigation safety and marine environment protection as well. Details of the programme manifest the current needs of the Polish Navy and PRS. Poland's inclusion in the European Union and the North Atlantic Treaty Organization was essential to that process.

The Cooperation Agreement with the Navy Command Headquarters defines the areas as:

- PRS participation in the development of rules, requirements, rule guidelines, standards, etc., for the construction of naval ships and marine technology;
- acceptance by PRS, on behalf of the Navy and at the agreed scope, of materials, machinery and equipment designed for naval ships;
- taking advantage of Parties experience at the approval of manufacturing works, laboratories, materials, naval ships machinery and equipment;
- participation of PRS and the Navy Command in the approval of materials, machinery and equipment manufactured at home and of naval ships and national floating units to be constructed;
- participation of PRS in directing some research and development and implementation works conducted by the Navy;
- mutual exchange of research and technical information related to shipbuilding, navigational safety and life-saving equipment, as well as international and national rules related to the safety of ships and naval ships and their equipment operation, and environment protection;
- cooperation in the field of standardization and unification in shipbuilding, within the scope of evaluation of draft defence standards and the Polish draft standards developed for exclusive needs of the state defence and security, and implementation of national standards and western standards;
- performance of substantial quality assessment of the analyses, studies and elaborations within the scope of specialities represented by Parties because of common application;
- technical support in designing, supervising the construction and acceptance of ships, naval ships and equipment at the agreed scope, at the stage of contract execution;
- exchange of experience and instruction materials on technical supervision.

With regard to international cooperation, PRS, for more than a decade, has been acting as a member of the International Naval Safety Association (INSA) based in London. The merchant fleet, which performs its duties on seas of the world, uses IMO (International Maritime Organization) established rules and resolutions. At the same time, naval ships apply the principle of balance between ship safety and operational capacity, thus determining the execution of other, different tasks concerning the commercial ships.

Considering the specifics of performed tasks and different structural arrangements of naval ships, rules have been introduced that compromise naval ship safety and its mission.

Given the above, INSA gathers class societies and navies of NATO countries and those of some non-NATO countries, such as North Africa, New Zealand, and Australia. The class societies of sea countries belonging to NATO

established NSCA (Naval Ship Classification Association) – an organization equivalent to IACS, thus bringing experience from the international market to develop safety standards for naval ships. Ensuring the safety of naval ships while maintaining compromise between civil and military look at the crew and floating unit safety is the main idea of the association.

Using gained experience and comprehensive knowledge, PRS approves the design and delivery-acceptance documentation of units built to strengthen the Polish Navy's potential. Our Company's employees assist in surveying the construction of naval assets and equipment manufactured at home or abroad. For this purpose, we employ headquarters PRS departments and foreign branch offices. Their hard work has resulted in massive experience carrying out naval ship surveys.

It is worth mentioning that since the 2nd World War, all the units of the Polish Navy have been designed based on the rules and publications of PRS, while the craft for the Polish Border Guard is designed, constructed and supervised by PRS under the Act on the Border Guard, the Order No. 6 of the Ministry of the Interior and Administration and the Agreement concluded between the Sea Border Guard Regional Unit and PRS.

The logistic support ship *ORP Kontradmiral Xawery Czernicki* has been the first naval ship supervised wholly by PRS. The next was *ORP Ślqzak*, delivered to the Polish Navy in 2018. In 2020, the construction supervision of a series of six modern tugboats of the B860 project was completed. In the present year, 2022, three minehunters of *Kormoran* type are successively supervised by PRS and transferred to service. In August this year (2022), the contract for supervision of the construction of the following three mine hunters was signed with a consortium comprising Remontowa Shipbuilding (RSB) and the Polish Armament Group Naval Shipyard (PGZ SW).

Conducting the *Ratownik* rescue ship project for the Polish Navy during the technical design phase was an excellent experience for the PRS Surveyors. PRS supervised and approved the design documentation of the naval ship for the execution of further design phases and preparation for construction.

Irrespective of acquired competencies and executed projects for the Polish Navy, we are preparing for the construction of other units included in the Technical Modernization Plan of Armed Forces. Decades of history, and hence many years' experience, allowed us to gain a strong position in the domestic market in the performance of surveys based on our rules and international standards. The Rules for the Classification and Construction of Naval Ships and other PRS rules and publications, national and allied bodies, and military standards constitute the basis for consideration of the naval ship's technical credentials.

At present, having experience from the construction of naval ships *Ślqzak* and *Kormoran* based on verification of design technical documentation for the

naval ship *Ratownik* and of the provisions of international Naval Ship Code ANEP-77, as well as conclusions and experience from the cooperation within NATO ship design capability group and meetings within INSA and NSCA, the 2022 edition of the PRS Rules for Naval Ships has been published.

Within these rules, previous requirements have been updated and complemented in a wide range, among the others, in relation to the principles of carrying out surveys, aspects of ensuring the combat readiness of a naval ship, impact strength of equipment and hull, and fire protection. As for the principles of naval ship design, on the basis of our own experience and respecting the Naval Ship Code, we included in the PRS Rules the possibility of application of alternative solutions different than typical rule solutions, which, however, fulfil formal safety goals and operational requirements contained in the Naval Ship Code.

The application of alternative solutions results from combining many different requirements, which are often difficult to fulfil within existing limitations concerning naval ship mass, size, and the necessity of ensuring adequate stability. In such cases, the required level of naval ship and its personnel safety may be provided by taking alternative solutions developed within comprehensive engineering analysis using risk analysis techniques.

PRS, participating actively in the activities of the INSA, who developed the above-mentioned Naval Ship Code, is up to date with contemporary technical solutions and requirements used by major NATO and world Navies. ANEP-77 was recommended by the NATO Naval Armaments Group (NNAG) for use by NATO Navies in accordance with STANREC 4807. The requirements adopted in the Naval Ship Code are formulated as Goal Based Standards. They are related to principal safety aspects, such as watertight integrity, stability and subdivision of naval ships, fire protection, integration of systems, evacuation and rescue, communication and navigation safety.

It is evident from the PRS experience gained during the verification of technical documentation and construction of naval ships for the Polish Navy that broader application of COTS (Commercial-of-the-shelf) technology would be reasonable in the field of auxiliary and support ships considering the cost-effect aspect and in some aspects also for combat ships. Using COTS technology means reducing construction costs and the waiting time for the product while gaining an acceptable technical level of the machinery or equipment. At present, the machinery and equipment of high technical level, resulting from the raising of standards for demanding types of ships, such as specialized units or passenger ships, are available on the commercial market. It applies to such machinery and systems as propulsion and steering systems, fire protection systems, automation systems, I.T. systems, vibration and noise suppression arrangements or specialized equipment.

The Polish Classification Society also acts actively to ensure the safety of naval ships in cooperation with ship aviation. PRS is an author of defence stan-

dard NO-19-A206:2009 “Ships and auxiliary naval vessels. Ship aviation infrastructure. Requirements”. This publication was developed because the uniformization of technical standards for securing aircraft operations based on naval ships has become necessary. This standard defines technical requirements for aviation infrastructure of naval ships equipped with helicopter landing area or VERTREP plane or a separate place for hoisting cargo and persons by helicopter winch. In a limited scope, it may be used for VTOL-type aircraft (for evaluation of the aircraft’s ability to take off and land vertically).

After the missile frigates of type OHP (Oliver Hazard Perry) were introduced in the Polish Navy, no institution could undertake to develop rules related to the safe performance of aircraft operations from the naval shipboard. First certifications of the aviation infrastructure were conducted by PRS based on then-existing NO-07-A025 “Common operations of naval ships and aircraft” 2002 and the document of USA Navy – Air Capable Ship Aviation Facilities Bulletin No. 1H.

Utilizing the experience gained by PRS during surveys on naval ships in service of OHP type and on modernized naval ship *ORP Kontradmiral X. Czernicki*, a new standard NO-19-A206 has been developed in PRS. The standard has been implemented in the Polish Armed Forces.

Based on the mandatory standard, *Certificates of Compliance for ship’s aviation facilities* are issued for:

- *ORP General K. Pułaski*, OHP type
- *ORP General T. Kościuszko*, OHP type
- *ORP Kontradmiral X. Czernicki*, 890 project
- *ORP Ślęzak*, 621 project.

The certificates confirm the ability of the naval ship to cooperate safely with domestic and foreign aircraft of defined parameters, considering mainly the take-off weight and the rotor diameter.

In the year 2020, the NO-07-A025:2013 standard was withdrawn from use. The Military Centre for Standardization, Quality and Codification applied to PRS for updating NO-19-A206. The draft of the updated defence standard includes elements from the withdrawn standard, as well as supplemented by information from the publication NATO APP2(f)MPP2(F) Helicopter Operations from Ships other than Aircraft Carriers (HOSTAC). The updated defence standard NO-19-A206:2022 was implemented at the beginning of 2022.

PRS also builds cybersecurity awareness among shipowners and ship crews.

Today’s world relies, to a great extent, on the maritime transport of goods persons and on executing services in maritime areas and their neighbourhoods. The Maritime Transportation System (MTS) is based on digital networks. These channels serve to exchange a vast amount of data, which is used for managing and controlling ships and harbour infrastructure. The following systems are perceived as sensitive in management: navigational systems with GPS

in the lead, container reloading systems, loading control systems for chemicals, fuels and other liquid cargo in harbours, etc.

GPS – Global Positioning System

MTS – Maritime Transport System

VTS – Vessel Traffic System

ECDIS – Electronic Chart and Data System

AIS/WAIS – Automatic Identification System/Warship AIS called Blue Force AIS or encrypted or secure AIS in accordance with STANAG 4668 Ed.2
Warship-Automatic Identification System

GMDSS - Global Maritime Distress and Safety System

MCCIS – Maritime Command, Comms and Information System

VDR – Voyage Data Recorder

GSM – cellular network

SAT COMM – satellite communication

EPIRB – Emergency Position-Indicating Radio Beacon

Those means contribute to safety on the sea – the safety of navigation. In the age of increased traffic on seas and management of maritime transport, the problem of security of onboard networks and systems responsible for safe navigation is more and more noticeable. All systems using external information resources are exposed to the harmful effects of attacks by hackers or other organizations willing to disturb the global maritime transport system, harbour security, and critical infrastructure of cargo handling terminals. Adverse effects of such actions can cause local or global disruption of deliveries, organization, handling and trade turnover on the sea and land routes. In extreme cases, they may also lead to maritime collisions and disasters.