Certificate no.:
TAA00003M1

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Fire Technical Ancillary Equipment

with type designation(s)
TYCO FPN

issued to
Tyco Fire & Integrated Solutions Ltd
Manchester, **United Kingdom**

is found to comply with
DNV GL rules for classification – Naval vessels

Application:

Product(s) approved by this certificate are accepted for installation on vessels design folder D43134.

Issued at **Hamburg** on **2025-06-05**
This Certificate is valid until **2027-06-03**.
DNV local unit: **UK & Ireland CMC & VMC**

Approval Engineer: **Jens Dietrich**

for **DNV**

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This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to USD 300 000.

Product description

Fire Protection Network (FPN) consisting of a redundant Ethernet ring with nodes:
-2 Redundant PLC/HMI stations mounted in different damage control zones
Major components:
-Siemens CPU 1515R-2PN (Hardware type approval TAA00001MN)
-Siemens HMI Touch Panel TP1200 Comfort (Hardware type approval TAA000016S)

-4 RIO, Remote I/O stations
Major components:
-Siemens ET200SP, IM155-6PN/2H, I/O modules (Hardware type approval TAA0000227).

Power supply: 2 x 24V DC.

Each RIO panel will be connected to local I/O which includes directly connecting to devices and Local Release Panels.
The main PLC system have an onboard Modbus TCP/IP server for communication with ship's IPMS.
Each PLC has an own Modbus TCP/IP communication to the IPMS for redundancy.

Integrated fire extinguishing systems:
-Foam Drencher System (AFFF)
-Water Mist Total Flooding System
-Water Mist Local Application Systems (FWBLAFFS)
-Water Mist System for Accommodation
-Helicopter SEMI-FIXED CO2 System
-Galley CO2 & R102 (Ansul) Fire Suppression

SW-Version: 4.18.

Application Limitation

The type approval covers software and design principles verified based on the design documentation of the FPN for vessel design D43134.

Approval conditions

The System redundancy is not in compliance with DNVGL RU-NAVAL Pt.3 Ch.3 Sec.10, 3.7 and is accepted by the end customer for the project D43134 in context with a spare part delivery for major control system components. Reference is made to the following documents: Circular 0179/2025, Reply to Technical Note 0174-2025-End Customer Consent of Fire Protection Network System Configuration for DNV Approval, issued 2025-04-07; Technical Note 0174/2025, issued 2025-03-06.
Circular 0087/2025 Reply to Technical Notes 1023-2024 and 1033-2024, issued 2025-02-21; Technical Note 1023/2024 issued 2024-12-12.

The RIO units need to be fed by redundant power supplies.

The design of the local release facilities shall allow activation of the respective extinguishing functions by manual pump start and manual opening of section valves even in case of failure of the FPN system.

Software control
All changes in software are to be recorded as long as the system is in use on board. Documentation of major changes is to be forwarded to DNV for evaluation and approval before implemented on board. Certification of modified functionality may be required for the particular vessel.

Type Approval documentation

Documents referenced by TM2101038 FAT Documents list issued 2025-04-15:

Document No.	Revision	Document Title
00051631-55500-F-3001	G	Fire Fighting Systems Cable Schedule
00051631-55500-F-3002	K	Fire Fighting Systems I/O Schedule
00051631-55500-F-3001	G	Local Application Water mist System. Electrical Block Diagram
00051631-55510-F-3101	H	Flight Deck & Hanger AFFF System. Electrical Block Diagram

OSL P1102-02-05 PLC-GA-001-INT	6	AFT RIO 1 Internal GA
OSL P1102-02-07 PLC-GA-001-INT	6	AFT RIO 2 Internal GA
OSL P1102-02-08 PLC-GA-001-INT	6	FWD RIO 1 Internal GA
OSL P1102-02-12 PLC-GA-001-INT	2	FWD RIO 2 Internal GA
OSL P1102-02-13 HMI-GA-001-INT	6	HMI CPU Internal GA
OSL P1102-02-01 PLC-GA-001-EXT	4	AFT RIO 1 External GA
OSL P1102-02-03 PLC-GA-001-EXT	4	AFT RIO 2 External GA
OSL P1102-02-04 PLC-GA-001-EXT	4	FWD RIO 1 External GA
OSL P1102-02-13 PLC-GA-001-EXT	3	FWD RIO 2 External GA
OSL P1102-02-15 HMI-GA-001-EXT	4	HMI CPU External GA
OSL-P1102-05-01-01 PLC-SCHEM-001	2	AFT RIO 1
OSL-P1102-05-02-01 PLC-SCHEM-001	2	AFT RIO 2
OSL-P1102-05-03-01 PLC-SCHEM-001	2	FWD RIO 1
OSL-P1102-05-04-01 PLC-SCHEM-001	2	FWD RIO 2
OSL-P1102-01 - MEKO A-100	2	Functional Design Specification (FDS)
OSL-P1102-08 - MEKO A-100	5	Factory Acceptance Test Procedure (FATP)
OSL-P1102-19 - MEKO A-100	6	Interface Requirements Spec. (IRS)
OSL-P1102-27 - MEKO A-100	2	Operation Maintenance Manual
OSL-P1102-28 - MEKO A-100	7	Failure Mode and Effects Analysis
TM2101038-AFFF-C&E-001	B	Foam Drencher System Cause & Effects Chart
TM2101038-WATERMIST-C&E-001	C	Water Mist System Cause & Effects Chart
TM2101038-GALLEY-C&E-001	0	Galley CO2 & R102 Cause & Effects Chart
TM2101038-SEMIFIXEDCO2-C&E-001	0	Helicopter Semi-fixed CO2 Cause & Effects chart
TM2101038-SA-001	3	Fire Protection Network System Architecture

Additional documents:
DNV GL Approval Dossier MEKO A-100MB Special Fire Extinguishing Systems, Rev.2, issued 2024-11-26;
Software Backup Records CI_P1102_101_TIA_Thyssenkrupp_version_date.ZAP, Version 17;
P1102 TKMS MEKO A-100 FR Software Statement OSL-P1102-FRSS, Rev.0.0.
Signed Factory Acceptance Test Procedure (FATP) Rev.5, issued 2024-09-14, witnessed Dec.2-5.2024.
TA Assessment Report Tyco Fire & Integrated Solutions, Manchester, issued by DNV UK, 2025-06-04
TA Assessment Report Orange Solutions, Manchester, issued by DNV UK, 2025-06-04.

Tests carried out
Functional Performance Test based on Factory Acceptance Test Procedure (FATP) OSL-P1102-08, Rev.5.

Marking of product
Software Version indicated on HMI; cabinets labelled with Manufacturer Orange Solutions, Ltd., Panel-ID no., project name and year of manufacture.

Periodical assessment
The scope of the periodical assessment is to verify that the conditions stipulated for the type are complied with, and that no alterations are made to the product design or choice of systems, software versions, components and/or materials.

The main elements of the assessment are:
- Ensure that type approved documentation is available
- Inspection of factory samples, selected at random from the production line (where practicable)
- Review of production and inspection routines, including test records from product sample tests and control routines

- Ensuring that systems, software versions, components and/or materials used comply with type approved documents and/or referenced system, software, component and material specifications
- Review of possible changes in design of systems, software versions, components, materials and/or performance, and make sure that such changes do not affect the type approval given
- Ensuring traceability between manufacturer's product type marking and the type approval certificate

A renewal assessment will be performed at renewal of the certificate.

END OF CERTIFICATE