ATTESTATION

NO. L0370/NPO/2021

Issued within the scope of Bureau Veritas Marine & Offshore General Conditions

Type of Ship	:	**Passenger vessel – coastal area**
Name of Ship	:	**Kostervång**
Register Number	:	**NA**
Shipyard	:	**Swedeship**
Project	:	**Conversion to battery propulsion**

The undersigned, N. Homma, Technical Director North Europe Zone, acting within the scope of the General Conditions of Bureau Veritas Marine & Offshore, which regulate the interventions of this Society

Herewith declares

With reference to:

- Applicable regulations
  - NR 467, Part F, Ch. 11, Sec 21 – Battery System
  - NR566, Part, Ch. 4 – Fire Safety
- Review limited to the installation of the Echandia LTO battery system and the safety assessment limited to the Battery Room
- Consequences for the ship design and implementation of mitigation measures as described in the HAZID analysis

the installation of the batteries in subject vessel is found to be in compliance with the indicated Rules, subject to the deviations identified during the HAZID workshop and where it has been indicated to battery system manufacturer recommendation. It is up to the Swedish Flag Administration to grant final approval.

Copenhagen, 23rd of June 2022

Nanne Homma
Technical Director North Europe Zone

The latest published Rules of the Bureau Veritas Marine & Offshore and the General Conditions therein are applicable.

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The main boundary conditions are:

- Battery room: the design review and survey at yard are limited to the installation of the batteries and to the battery room.
- Insulation of the lowest part of bulkhead between ER and Battery room, is carried out with Fire protection paint, due to risk of contamination with oil/water. Subject to Flag acceptance.
- Statutory requirements remain under the responsibility of Swedish flag.
- Time for rescue used in the calculation of the duration of Emergency source of power is 1.5h Subject to Flag acceptance.
- Battery room fire safety concept: As per manufacturer recommendation in case of fire inside the battery room the ventilation is to remain open and run at high volume in order to remove the toxic and flammable gases and to provide cooling to the room, together with the activation of the water based fire fighting. Following changes have been implemented to comply with the requirement:
    - Fire damper on battery room ventilation shall remain open and revert to open position in case of power failure
    - Emergency stop button has been removed as activation would contradict the battery manufacturer safety philosophy
    - Operation of dampers and ventilator is carried out from wheel house and is different in case of fire in battery room or in adjacent space. It is recommended that clear and unambiguous instructions are placed at each control station
    - Ventilation exhaust from battery room is to be of same structural integrity and fire insulation standard as the battery room bulkheads

Appendix 1:

List of reviewed drawings:

Title	Drawing nbr.	Rev.	Review date
FDO Marine Fire Damper T ype Approval Certificate	TAF00000CF_2	0	23-06-2022
MED-BV-Certificate-for-Halton-FDO	38060/B0	0	23-06-2022
FDO A0(A60) Fire and Gas Damper	FDO	0	23-06-2022
echandia commisioning report	echandia commisioning report	0	22-06-2022
Echandia FAT and insulation measurement	Echandia FAT	0	22-06-2022
Power balance calculation	22406-890-01	02	21-06-2022
Ventilation ducts battery room	C005-081-2	2	21-06-2022
HazID_protocol Kostervåg	220111	C	14-06-2022
Summary report on Vessel DC power	Short-circuit simulation Kostervag	1.2	13-06-2022
Battery Room Ventilation System	C005-410	8	13-06-2022
HazID_protocol Kostervåg	220111	C	13-06-2022
DC_Max	DC_Max	0	13-06-2022
DC_Min	DC_Min	0	13-06-2022
Battery Room Ventilation System	C005-410	8	03-06-2022
Ultrafog Folder 1 System description	Ultrafog Folder 1 System description	0	16-05-2022
Fire Main System	3-7259	D	04-05-2022
VENT. / GAS DETEC. BATTERY ROOM	22406-574-01	P01	04-05-2022
Hazardous Areas	C005-415	A	04-05-2022
Battery LTO IRS	P380-Echandia	1.2	03-05-2022
Fire Control Plan	2-5638	E	20-04-2022
Hazardous Areas	C005-415	A	19-04-2022
FAT procedures	22406-852-71	0	04-04-2022
FMEA_complement	380	1.1	06-04-2022
Shore supply system	22406-868-01	0	04-04-2022
Fire system battery room area	Fire-Fighting system	2	23-03-2022

Title	Drawing nbr.	Rev.	Review date
Battery room ventilation description	Kostervåg Ventilation battery room	B	16-03-2022
Battery room insulation, system description	Kostervåg battery room insulation	4	16-03-2022
Battery room insulation	1-9678	H	15-03-2022
Fire system battery room area	Fire-Fighting system	2	27-01-2022
El Single Line Diagram	22406-870-01	P02	20-01-2022
Battery FAT	380-FAT	1.0	16-01-2022
Battery Technical Specification	380-TS	1.1	17-01-2022
MIAS Functional Failure Analysis	22406-852-52	P01	17-01-2022
Battery Room Arrangement	C005-306	2	17-01-2022
Battery FMEA	008-TS	1.0	17-01-2022
MIAS Communication Overview	22406-852-01	P01	17-01-2022
Battery Commissioning	380-Commissioning	1.0	16-01-2022
MIAS Functional Description	22406-852-51	P01	16-01-2022
Battery Operators Manual	380-M	2.0	16-01-2022
Battery excerpt ETUG Configurations	Excerpt	1.2	16-01-2022
Battery Products Safety Data Sheet	SB-SDS-P6001E	1	16-01-2022
Battery Test program for type approval BV e tug	Test prog	1	16-01-2022
Gas Detection	22406-811-02	PO	16-01-2022
Technical Reference for Li-ion Battery Explosion Risk and Fire Suppression	1144K9G7-12	4	16-01-2022
TA Certificate	61827	0	17-12-2021