ID	Title	Description
TIMP-479	291.S.245.001 Rev 02 - Technical Specification of the Voith Schneider SoS.pdf	
TIMP-480	291.S.245.001 Rev 02 - Technical Specification of the Voith Schneider SoS.pdf	
TIMP-481	TABLES OF CONTENTS	
TIMP-492	1 SCOPE	
TIMP-500	This specification describes the Vendor	This specification describes the Vendor requirements for the technical-economic proposal o
TIMP-501	The quoted scope of supply	The quoted scope of supply shall fulfil the commercial requirements as per the side docum
TIMP-502	The CDRL in Annex 1	The CDRL in Annex 1 is provided to the Vendor as a guideline in order to set the Cost of the
TIMP-503	1.1 RINA CLASS NOTATION	
TIMP-506	The Vessel will be classified	The Vessel will be classified according to the RINAMIL regulations with the following main c
TIMP-507	– NC ✠; Auxiliary Ship	– NC ✠; Auxiliary Ship – Mine Countermeasure Vessel
TIMP-508	The above main class characteristics	The above main class characteristics are common for both coastal and coastal minesweeper
TIMP-509		(image: image/png)
TIMP-510		(image: image/png)
TIMP-511	Specifically, the Offshore Navigation notation	Specifically, the Offshore Navigation notation allows navigation up to 200 nautical miles fr
TIMP-512		(image: image/png)
TIMP-513	– SHOCK-FLOAT Resistance of hull	– SHOCK-FLOAT Resistance of hull plating to underwater explosion
TIMP-514	– SHOCK-WHIP Hull girder resistance	– SHOCK-WHIP Hull girder resistance to whipping
TIMP-515	– SHOCK-FUNCT Maintenance of specific	– SHOCK-FUNCT Maintenance of specific functions following an underwater explosion
TIMP-516	– ✠ AUT-QAS Qualified automation	– ✠ AUT-QAS Qualified automation system
TIMP-517	– AUT-PORT Pier Monitoring System	– AUT-PORT Pier Monitoring System function
TIMP-518	– MARPOL I MARPOL Annex	– MARPOL I MARPOL Annex I Compliance – Oil Pollution
TIMP-519	– MARPOL IV MARPOL Annex	– MARPOL IV MARPOL Annex I Compliance – Sewage Pollution
TIMP-520	– MARPOL V MARPOL Annex	– MARPOL V MARPOL Annex I Compliance – Waste Pollution
TIMP-521	– MARPOL VI Compliance with	– MARPOL VI Compliance with MARPOL Annex I – Air Pollution
TIMP-522	– ✠ Certification of lifting	– ✠ Certification of lifting equipment
TIMP-523	In the context of the	In the context of the Risk Reduction studies, the applicability of the following will also be as
TIMP-524	SKC (L, I1, I2, I3,	SKC (L, I1, I2, I3, I4) Station Keeping Capability (*)
TIMP-525	✠ AVM-DPS Duplication/redundancy of propulsion	✠ AVM-DPS Duplication/redundancy of propulsion systems
TIMP-526	COMF-NOISE Compliance with noise limits	COMF-NOISE Compliance with noise limits for comfort on board
TIMP-527	COMF-VIB Compliance with vibration limits	COMF-VIB Compliance with vibration limits for comfort on board
TIMP-528	GREEN PLUS-MIL Evaluation of additional	GREEN PLUS-MIL Evaluation of additional prevention features pollution
TIMP-529		(image: image/png)
TIMP-504	1.2 STATUTORY CERTIFICATION	
TIMP-530	In addition to class certification,	In addition to class certification, the CNG class will be designed and built in compliance wi
TIMP-531	With regard to Annex VI	With regard to Annex VI of MARPOL, compliance with Tier II will be assessed.
TIMP-505	1.3 APPLICABLE REQUIREMENTS	
TIMP-532	The following Table indicates the	The following Table indicates the box crossed sections and paragraphs of the specification th
TIMP-493	Para. No. Title of the Paragraph Reqmnt	
TIMP-533	4 QUOTED SCOPE OF SUPPLY AND REQUIREMENTS	| | 4.5.2.4 | Vendor Documentation |
TIMP-494	Para. No. Title of the Paragraph Reqmnt	
TIMP-534		(image: image/png)
TIMP-495	Para. No. Title of the Paragraph Reqmnt	
TIMP-535		(image: image/png)
TIMP-496	Para. No. Title of the Paragraph Reqmnt	
TIMP-536		(image: image/png)
TIMP-497	2 APPLICABLE DOCUMENTS	
TIMP-537	2.1 GENERAL	
TIMP-540	The applicable documents are listed	The applicable documents are listed in the sections of this specification.
TIMP-541	Unless otherwise specified, the Vendor	Unless otherwise specified, the Vendor can propose equivalent recognized standard subject
TIMP-538	2.2 GOVERNMENT & NON-GOVERNMENT DOCUMENTS	
TIMP-542	The following regulations are to	The following regulations are to be considered as contractual obligations for the Vendor, as
TIMP-543	1. MIL-S-901 D "SHOCK TESTS.	1. MIL-S-901 D "SHOCK TESTS. H.I. (HIGH-IMPACT) SHIPBOARD MACHINERY, EQUIPMENT
TIMP-544	2. MIL-STD-167-1A "MECHANICAL VIBRATIONS OF	2. MIL-STD-167-1A "MECHANICAL VIBRATIONS OF SHIPBOARD EQUIPMENT (TYPE I – ENV
TIMP-545	3. MIL-STD-740-1/2 "AIRBORNE AND STRUCTUREBORNE	3. MIL-STD-740-1/2 "AIRBORNE AND STRUCTUREBORNE NOISE MEASUREMENTS AND AC
TIMP-546	4. MIL-STD-461 G "REQUIREMENTS FOR	4. MIL-STD-461 G "REQUIREMENTS FOR THE CONTROL OF ELECTROMAGNETIC INTERFER
TIMP-547	5. IMO, INTERNATIONAL CONVENTION OF	5. IMO, INTERNATIONAL CONVENTION OF SAFETY AT SEA SOLAS-1974 as amended: Chapt
TIMP-548	6. MONTREAL PROTOCOL – OZONE	6. MONTREAL PROTOCOL – OZONE PROTECTION ACT 1989 SCHEDULE 3
TIMP-549	7. IMO, INTERNATIONAL CONVENTION FOR	7. IMO, INTERNATIONAL CONVENTION FOR PREVENTING POLLUTION BY VESSELS MARPO
TIMP-550	8. CONVENTION ON THE INTERNATIONAL	8. CONVENTION ON THE INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS A
TIMP-551	10. IEC 60529 "DEGREES OF	10. IEC 60529 "DEGREES OF PROTECTION PROVIDED BY ENCLOSURES (IP CODE)"
TIMP-552	11. IEC 61363 "PROCEDURES FOR	11. IEC 61363 "PROCEDURES FOR CALCULATING SHORT-CIRCUIT CURRENTS"
TIMP-553	12. IEC 60092-350 "GENERAL CONSTRUCTION	12. IEC 60092-350 "GENERAL CONSTRUCTION AND TEST METHODS OF POWER, CONTROL
TIMP-554	13. IEC 60754 "TEST ON	13. IEC 60754 "TEST ON GASES EVOLVED DURING COMBUSTION OF MATERIALS FROM CAI
TIMP-555	14. IEC 60332 "TESTS ON	14. IEC 60332 "TESTS ON ELECTRIC AND OPTICAL FIBRE CABLES UNDER FIRE CONDITION
TIMP-556	15. IEC 60228 "CONDUCTORS OF	15. IEC 60228 "CONDUCTORS OF INSULATED CABLES"
TIMP-557	16. IEC 60092-351 "INSULATING MATERIALS	16. IEC 60092-351 "INSULATING MATERIALS FOR SHIPBOARD AND OFFSHORE UNITS, P
TIMP-558	17. IEC 60092-359 "SHEATHING MATERIALS	17. IEC 60092-359 "SHEATHING MATERIALS FOR SHIPBOARD POWER AND TELECOMMUN
TIMP-559	MIL-I-22023 "INSULATION FELT THERMAL AND	MIL-I-22023 "INSULATION FELT THERMAL AND SOUND ABSORBING FELT FIBROUS GLASS
TIMP-560	MIL-STD-769 "THERMAL INSULATION REQUIREMENTS FOR	MIL-STD-769 "THERMAL INSULATION REQUIREMENTS FOR MACHINERY AND PIPING"
TIMP-561	MIL-I-2781 "INSULATION PIPE THERMAL"	MIL-I-2781 "INSULATION PIPE THERMAL"
TIMP-562	MIL-HDBK-802 "DESIGN OF ELECTRICAL EQUIPMENT	MIL-HDBK-802 "DESIGN OF ELECTRICAL EQUIPMENT WITH SMALL STRAY MAGNETIC FIE
TIMP-563	22. NAV 30 A001 "NORME	22. NAV 30 A001 "NORME D'IMPIEGO DELLE MACCHINE D'URTO INSTALLATE PRESSO LA
TIMP-564	23. NAV 30 A002 "NORME	23. NAV 30 A002 "NORME PER L'ESECUZIONE DI PROVE DI VIBRAZIONI MECCANICHE AM
TIMP-565	24. MIL-STD-167-1 "MECHANICAL VIBRATIONS OF	24. MIL-STD-167-1 "MECHANICAL VIBRATIONS OF SHIPBOARD EQUIPMENT (TYPE I – ENV
TIMP-566	25. ISO 8528-9 "RECIPROCATING INTERNAL	25. ISO 8528-9 "RECIPROCATING INTERNAL COMBUSTION ENGINE DRIVEN ALTERNATIN
TIMP-567	26. ISO 8528-10 "RECIPROCATING INTERNAL	26. ISO 8528-10 "RECIPROCATING INTERNAL COMBUSTION ENGINE DRIVEN ALTERNATI
TIMP-568	27. ISO 6798 "RECIPROCATING INTERNAL	27. ISO 6798 "RECIPROCATING INTERNAL COMBUSTION ENGINES — MEASUREMENT OF S
TIMP-569	28. ISO 13332 "RECIPROCATING INTERNAL	28. ISO 13332 "RECIPROCATING INTERNAL COMBUSTION ENGINES — TEST CODE FOR T
TIMP-570	29. ISO 484 "SHIPBUILDING —	29. ISO 484 "SHIPBUILDING — SHIP SCREW PROPELLERS — MANUFACTURING TOLERANC
TIMP-571	30. Naval Ships – Rina	30. Naval Ships – Rina Rules 2017 (RINAMIL)
TIMP-572	31. NAV-70-4730-0003-13-00B000 - Normativa tubi	31. NAV-70-4730-0003-13-00B000 - Normativa tubi flessibili
TIMP-573	32. SMM/ISN 51 "Regolamento per	32. SMM/ISN 51 "Regolamento per la gestione della configurazione delle Unità Navali della M
TIMP-574	33. NAV-70-7610-0002-34-00B000 "Normativa per l'informazione	33. NAV-70-7610-0002-34-00B000 "Normativa per l'informazione della manualistica navale
TIMP-575	34. NAV-80-9999-0013-14-00B000 "Specifica tecnica per	34. NAV-80-9999-0013-14-00B000 "Specifica tecnica per la compilazione dei manuali tecnic
TIMP-576	35. 2006/42/CE "Direttiva Macchine"	35. 2006/42/CE "Direttiva Macchine"
TIMP-577	36. S1000D Issue N°4.1 "International	36. S1000D Issue N°4.1 "International specification for technical publications using a comm
TIMP-578	37. NAV-70-6160-0007-14-00B000 "Normativa tecnica per	37. NAV-70-6160-0007-14-00B000 "Normativa tecnica per impianti elettrici di bordo delle u
TIMP-579	38. NAV 50-6145-0003-13-00B000 "Disposizioni relative	38. NAV 50-6145-0003-13-00B000 "Disposizioni relative alla targhettatura e siglatura dei ca
TIMP-580	39. NAV-70-6160-0006-14-00B000 "Norme per le	39. NAV-70-6160-0006-14-00B000 "Norme per le installazioni elettriche nei luoghi con peri
TIMP-581	40. NAV-70-1096-0001-13-00B000 "Norma tecnica per	40. NAV-70-1096-0001-13-00B000 "Norma tecnica per l'allestimento delle aree destinate al
TIMP-582	41. NAV-80-6145-0005-13-00B000 "Specifica tecnica per	41. NAV-80-6145-0005-13-00B000 "Specifica tecnica per cavi elettrici atossici, idonei per l'i
TIMP-583	42. NAV-80-6145-0003-14-00B000 "Specifica tecnica per	42. NAV-80-6145-0003-14-00B000 "Specifica tecnica per cavi di interconnessione elettrica e
TIMP-584	43. NAV-80-6145-0006-13-00B000 "Specifica tecnica di	43. NAV-80-6145-0006-13-00B000 "Specifica tecnica di idoneità all'impiego per cavi di inter
TIMP-585	44. STANAG 1008 "CHARACTERISTICS OF	44. STANAG 1008 "CHARACTERISTICS OF SHIPBOARD 440V/230V/115V 60Hz, 440V/115V
TIMP-586	45. IEC 61363 "Electrical installations	45. IEC 61363 "Electrical installations of ships and mobile and fixed offshore units - Part 1: F
TIMP-587	45. IEC 61363 "Electrical installations	45. IEC 61363 "Electrical installations of ships and mobile and fixed offshore units - Part 1: F
TIMP-588	46. IEC 60068-2-6 "Environmental testing	46. IEC 60068-2-6 "Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)"
TIMP-589	46. IEC 60068-2-6 "Environmental testing	46. IEC 60068-2-6 "Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)"
TIMP-590	47. IEC 60072 series "Rotating	47. IEC 60072 series "Rotating electrical machines - Dimensions and output series"
TIMP-591	48. IEC 60092 series "Electrical	48. IEC 60092 series "Electrical installation in ships"
TIMP-592	49. IEC 60754-1/2 "Test on	49. IEC 60754-1/2 "Test on gases evolved during combustion of materials from cables"

TIMP-593	50. IEC 60794 series “Optical	50. IEC 60794 series “Optical fibre cables”
TIMP-594	51. CEI 61439-1 “Low-voltage switchgear	51. CEI 61439-1 “Low-voltage switchgear and controlgear assemblies – Part 1 : General rule
TIMP-595	52. CEI EN 60617 “Graphical	52. CEI EN 60617 “Graphical Symbols for Diagrams”
TIMP-596	European Regulation 2019/1781	European Regulation 2019/1781
TIMP-597	54. NATO, Military Agency for	54. NATO, Military Agency for Standardization (MAS), “Standardized Wave and Wind Envir
TIMP-598	55. NATO, Military Agency for	55. NATO, Military Agency for Standardization (MAS), “Common procedures for seakeeping
TIMP-599	56. NORMA TECNICA M.M. N.	56. NORMA TECNICA M.M. N. 60612 “NORME PER IL BILANCIAMENTO ED IL RILIEVO DELL
TIMP-539	2.3 ORDER OF PRECEDENCE	
TIMP-600	Nothing in this document, however,	Nothing in this document, however, supersedes applicable laws and regulations unless a spe
TIMP-498	3 TERMS AND ABBREVIATIONS	
TIMP-601	Amministrazione Difesa	Amministrazione Difesa
TIMP-602	Active front end	Active front end
TIMP-603	Annual Operating Rate	Annual Operating Rate
TIMP-604	Built In Test Equipment	Built In Test Equipment
TIMP-605	Built In Self Test	Built In Self Test
TIMP-606	Bow Thruster	Bow Thruster
TIMP-607	Contract Data Requirement List	Contract Data Requirement List
TIMP-608	Conformitè Europëenne	Conformitè Europëenne
TIMP-609	Comitato Elettrotecnico	Comitato Elettrotecnico
TIMP-610	Cacciamine di Nuova Generazione –	Cacciamine di Nuova Generazione – New Generation Minehunter
TIMP-611	Cacciamine di Nuova Generazione Costiera	Cacciamine di Nuova Generazione Costiera – New Generation Coastal Minehunter
TIMP-612	Cacciamine di Nuova Generazione Costiera	Cacciamine di Nuova Generazione Costiera – New Generation Oceangoing Minehunter
TIMP-613	Commercial Of the Shelf	Commercial Of the Shelf
TIMP-614	Dynamic Positioning (Class 1)	Dynamic Positioning (Class 1)
TIMP-615	Dynamic Positioning (Class 2)	Dynamic Positioning (Class 2)
TIMP-616	Extremely Low-Frequency Electromagnetic	Extremely Low-Frequency Electromagnetic
TIMP-617	Equipment Under Test	Equipment Under Test
TIMP-618	Electric Voith Schneider Propeller	Electric Voith Schneider Propeller
TIMP-619	HW Hardware	HW Hardware
TIMP-620	Istituto italiano del marchio di	Istituto italiano del marchio di qualità
TIMP-621	IT system	IT system
TIMP-622	Life Cycle Cost	Life Cycle Cost
TIMP-623	Line Replaceable Unit	Line Replaceable Unit
TIMP-624	Land Based Magnetic Range	Land Based Magnetic Range
TIMP-625	Hydraulic Power Unit	Hydraulic Power Unit
TIMP-626	in accordance with	in accordance with
TIMP-627	Maximum Continuous Rating	Maximum Continuous Rating
TIMP-628	Marina Militare (Italian Navy)	Marina Militare (Italian Navy)
TIMP-629	Maintenance Task Analysis	Maintenance Task Analysis
TIMP-630	Mean Time Between Failure	Mean Time Between Failure
TIMP-631	Niveau Technique d’Intervention (Technical Level	Niveau Technique d’Intervention (Technical Level of Intervention)
TIMP-632	Original Equipment Manufacturer	Original Equipment Manufacturer
TIMP-633	PAS Period at sea (in	PAS Period at sea (in days, for a mission)
TIMP-634	PSM RIM Motor	PSM RIM Motor
TIMP-635	RFI Radio Frequency Interference	RFI Radio Frequency Interference
TIMP-636	RoHS Restriction of Hazardous Substances	RoHS Restriction of Hazardous Substances Directive
TIMP-637	ROM Rough Order of Magnitude	ROM Rough Order of Magnitude
TIMP-638	SRU Shop Replaceable Unit	SRU Shop Replaceable Unit
TIMP-639	SS/AA Subsystems/Apparatus	SS/AA Subsystems/Apparatus
TIMP-640	TS Technical Specification	TS Technical Specification
TIMP-641	STTE Special Tools and Test	STTE Special Tools and Test Equipment
TIMP-642	TTE Tools and Test Equipment	TTE Tools and Test Equipment
TIMP-643	TBD To Be Defined	TBD To Be Defined
TIMP-644	UEP Underwater Electric Potential	UEP Underwater Electric Potential
TIMP-645	UU.NN. Vessels	UU.NN. Vessels
TIMP-646	VIT Voith Inline Thruster	VIT Voith Inline Thruster
TIMP-647	VSP Voith Schneider Propeller	VSP Voith Schneider Propeller
TIMP-648	WEEE Waste from Electrical and	WEEE Waste from Electrical and Electronic Equipment
TIMP-499	4 QUOTED SCOPE OF SUPPLY AND REQUIREMENTS	
TIMP-649	4.1 SCOPE OF SUPPLY	
TIMP-653	The quoted scope of supply	The quoted scope of supply will be no. one (1) shipset each composed by a complete propuls
TIMP-654	Two (2) Propellers:	Two (2) Propellers:
TIMP-655	• #1 eVSP21-6/175 MIL ccw	• #1 eVSP21-6/175 MIL ccw (port) and #1 eVSP21-6/175 MIL cw (stbd)
TIMP-656	• #2 Variable Frequency Drive	• #2 Variable Frequency Drive (eVSP-VFD) both with shore connection capabilities (no para
TIMP-657	• #2 Hydraulic power unit	• #2 Hydraulic power unit (HPU)
TIMP-658	• #2 Variable Frequency Drive	• #2 Variable Frequency Drive (HPU-VFD)
TIMP-659	– Two (2) Bow Thrusters:	– Two (2) Bow Thrusters:
TIMP-660	• #2 VIT 850-200	• #2 VIT 850-200
TIMP-661	#2 Variable Frequency Drive (HPU-VFD)	#2 Variable Frequency Drive (HPU-VFD)
TIMP-662	Any other equipment/items in order	Any other equipment/items in order to guarantee the proper operation of the propulsion sy
TIMP-663	The remote-controlled transfer switches shall	The remote-controlled transfer switches shall preferably integrated/embedded in the VFDs.
TIMP-664	The Vendor shall detail the	The Vendor shall detail the complete breakdown of the required scope of supply expanded t
TIMP-650	4.2 PERFORMANCE AND DETAILED CHARACTERISTICS	
TIMP-665	4.2.1 Operative Profile	
TIMP-666	Vessel lifecycle, 30 Years, as	Vessel lifecycle, 30 Years, as well for SoS equipment
TIMP-667	Vessel running hour per year	Vessel running hour per year at sea: 1600
TIMP-668	Period at sea (PAS, in	Period at sea (PAS, in days, for a mission): up to 10 Speed [kn] 0÷6 0÷10 10÷14 Minehunti
TIMP-669	Operational availability at sea ≥	Operational availability at sea ≥ 90% of AOR
TIMP-670	Technical availability ≥ 70% of	Technical availability ≥ 70% of service life
TIMP-671	a) Operational availability at sea:	a) Operational availability at sea: this is the measure relating to the probability that the syst
TIMP-672	b) Technical availability: this is	b) Technical availability: this is the measure relating to the percentage during the life cycle t
TIMP-673	See the ILS Technical Specification	See the ILS Technical Specification for the AOR value.
TIMP-651	4.3 PHYSICAL CHARACTERISTICS	
TIMP-674	Weights and overall dimensions (see	Weights and overall dimensions (see Figure 4.2.1) obtained by estimate or calculations are r
TIMP-675	XXXX XXXX Width XXX mm	XXXX XXXX Width XXX mm XXX mm Length XXX mm XXX mm Height XXX mm XXX mm
TIMP-652	4.4 ENVIRONMENTAL CONDITIONS 4.4.1 General	
TIMP-676	Standard Conditions Extreme Conditions	Standard Conditions Extreme Conditions
TIMP-677	• Ambient Air temperature -5°C	• Ambient Air temperature -5°C to 35°C -10°C to 41°C
TIMP-678	• Machinery rooms Air 2°C	• Machinery rooms Air 2°C to 55°C 2°C to 55°C temperature
TIMP-679	• Relative humidity ≤80% at	• Relative humidity ≤80% at 35°C ≤95% at 35°C
TIMP-680	• Seawater temperature -2°C to	• Seawater temperature -2°C to 32°C -2°C to 36°C
TIMP-681	• Seawater salinity ≤39000 ppm	• Seawater salinity ≤39000 ppm TDS ≤43000 ppm TDS
TIMP-682	4.4.2 Performances and Sea Conditions	
TIMP-683	The ship shall be designed	The ship shall be designed and build to:
TIMP-684	Reach a maximum speed of	Reach a maximum speed of 14 kn in Sea State 3 (SS3) with foul bottom of 12 months
TIMP-685	have a continuous cruising speed	have a continuous cruising speed of at least 10 knots and transfer itself up to Sea State Doug
TIMP-686	conduct mine hunting, in the	conduct mine hunting, in the limit operating conditions of CMM operations (Sea State Dougl
TIMP-687	• a Mine hunting speed	• a Mine hunting speed of up to 6 knots;
TIMP-688	• Track & Station keeping	• Track & Station keeping capability as per here-below requirements.
TIMP-482	Station Keeping	
TIMP-689	The Ship shall be capable	The Ship shall be capable of hovering using the propulsion system, controlled by the minehu
TIMP-690	– Sea state 3, in	– Sea state 3, in operating condition up to and including tidal streams of 2 kn and true wind

TIMP-691	– Sea state 4, in	– Sea state 4, in operating condition up to and including tidal streams of 4 kn and true wind
TIMP-483	Track Keeping	
TIMP-692	The ship shall be capable	The ship shall be capable of satisfying the track requirements as follows:
TIMP-693	When minehunting at 4 kn	When minehunting at 4 kn with the propulsion, the deviation from the track shall not exceed
TIMP-694	10 m for 95% of	10 m for 95% of time at the top of sea state 2,
TIMP-695	15 m for 95% of	15 m for 95% of time at the top of sea state 3,
TIMP-696	25 m for 95% of	25 m for 95% of time at the top of sea state 4.
TIMP-697	Sea State (STANAG 4194):	Sea State (STANAG 4194):
TIMP-698	SS2 → Vw = 8,5	SS2 ↔ Vw = 8,5 kn; Hs = 0,3 m
TIMP-699	SS3 → Vw = 13,5	SS3 ↔ Vw = 13,5 kn; Hs = 0,88 m
TIMP-700	SS4 → Vw = 19	SS4 ↔ Vw = 19 kn; Hs = 1,88 m
TIMP-701	Current speed and direction: 1	Current speed and direction: 1 kn for all directions.
TIMP-702	Wind direction: beam wind.	Wind direction: beam wind.
TIMP-703	Wave direction: in the ranges	Wave direction: in the ranges from -30 to 30 degrees and from -150 and 150 degrees.
TIMP-484	Rest ability	
TIMP-704	The ship shall be capable	The ship shall be capable of:
TIMP-705	Change of geographical position;	Change of geographical position;
TIMP-706	2. Heading change of 90	2. Heading change of 90 degrees.
TIMP-707	Sea State (STANAG 4194):	Sea State (STANAG 4194):
TIMP-708	SS2 → Vw = 8,5	SS2 ↔ Vw = 8,5 kn; Hs = 0,3 m
TIMP-709	SS3 → Vw = 13,5	SS3 ↔ Vw = 13,5 kn; Hs = 0,88 m
TIMP-710	SS4 → Vw = 19	SS4 ↔ Vw = 19 kn; Hs = 1,88 m
TIMP-711	Current speed and direction: 1	Current speed and direction: 1 kn for all directions.
TIMP-712	Wind direction: beam wind.	Wind direction: beam wind.
TIMP-713	Wave direction: in the ranges	Wave direction: in the ranges from -30 to 30 degrees and from -150 and 150 degrees.
TIMP-485	Launching of vehicles	
TIMP-714	The ship shall be capable	The ship shall be capable of: as results obtained by the station keeping analysis, seakeeping
TIMP-486	Countermeasure operations at low speed	
TIMP-715	The ship shall be capable	The ship shall be capable of: as results obtained by the track keeping analysis, seakeeping
TIMP-487	Roll reduction at zero speed	
TIMP-716	The ship shall be capable	The ship shall be capable of: roll reduction at zero speed in the weather condition of refere
TIMP-717	• sea keeping, maneuverability and	• sea keeping, maneuverability and platform stability characteristics such as to allow the p
TIMP-718	• operate in all conceivable	• operate in all conceivable meteorological conditions except for those considered "prohibiti
TIMP-719	4.4.3 Loads due to Ships motion	
TIMP-728	Ship motion shall be assumed	Ship motion shall be assumed to give the loading factors specified herein. These factors inclu
TIMP-729	design loads, such as hydrostatic	design loads, such as hydrostatic loads and deck live loads. It shall be assumed that any com
TIMP-730	Longitudinal factor is 0.05 g	Longitudinal factor is 0.05 g
TIMP-731	Transverse factor is 0.53 g	Transverse factor is 0.53 g
TIMP-732	Vertical factor is 0.68 g.	Vertical factor is 0.68 g.
TIMP-720	4.4.4 Attitude	
TIMP-733	The equipment shall be designed	The equipment shall be designed to operate satisfactorily and maintain satisfactory lubricat
TIMP-734		(image: image/png)
TIMP-721	4.5 MAGNETIC, UEP AND ELFE 4.5.1 General Information	
TIMP-735	The design philosophy and construction	The design philosophy and construction processes of the MCMV are all aimed at producing s
TIMP-736	Generally speaking, three classes of	Generally speaking, three classes of phenomena involve the generation of the undesired mag
TIMP-737	- Magnetostatic Field, due to	- Magnetostatic Field, due to materials having magnetic properties and which can exhibit int
TIMP-738	- Eddy Currents Magnetic Field,	- Eddy Currents Magnetic Field, due to the electric currents flowing in metallic items moving
TIMP-739	recommended, particularly when the equipment	recommended, particularly when the equipment or system creates an electrically continuou
TIMP-740	- Stray Magnetic Field, due	- Stray Magnetic Field, due to AC and DC currents flowing in an electric circuit for operatin
TIMP-741	IMPORTANT NOTE: the following paragraphs	IMPORTANT NOTE: the following paragraphs will define the general requirements to provid
TIMP-742	The equipments and components installed	The equipments and components installed in the sea water shall be designed to minimize th
TIMP-743	4.5.2 Magnetic Silencing Requirements	
TIMP-748	4.5.2.1 General Requirements	
TIMP-753	This section contains general magnetic	This section contains general magnetic silencing requirements to be applied to the supply by
TIMP-754	Should a material and/or unit	Should a material and/or unit to be supplied fully meet the general requirements of this sec
TIMP-755	Should a material and/or unit	Should a material and/or unit be only partially compliant with the general requirements of t
TIMP-756	IMPORTANT NOTE:	IMPORTANT NOTE:
TIMP-757	Since compliance or non-compliance to	Since compliance or non-compliance to general magnetic requirements shall be declared un
TIMP-749	4.5.2.2 Materials	
TIMP-758	Materials used shall be non-magnetic,	Materials used shall be non-magnetic, i.e. materials having a bulk relative magnetic permeab
TIMP-759	Besides non metallic materials, example	Besides non metallic materials, example of non-magnetic low-magnetisable commonly availa
TIMP-760	Concerning the presence of electric	Concerning the presence of electric and/or electromechanical components which contain fe
TIMP-761	Moreover, in order to minimize	Moreover, in order to minimize the eddy current magnetic signature, use of materials having
TIMP-762	As a rule of thumb,	As a rule of thumb, the following specific cases apply:
TIMP-763	− aluminum items/equipment are completely	− aluminum items/equipment are completely acceptable when the weight of the item/equip
TIMP-764	− austenitic stainless steel items/equipment	− austenitic stainless steel items/equipment are also directly accepted when the weight of th
TIMP-765	Nevertheless, a more articulated acceptability	Nevertheless, a more articulated acceptability criterion, which depends on the actual height
TIMP-766	4.5.2.2.1 Definition of the ECSAI of an Item/Equipment	
TIMP-767	ECSAI means Eddy Current Source	ECSAI means Eddy Current Source Acceptability Index and is defined as follows: ECSAI =
TIMP-768	• α MAT is a	• α MAT is a parameter of the specific material that makes up the item and is listed in the ta
TIMP-769	• C is a parameter	• C is a parameter that is equal to 1 if the height H of the item as oriented on board is lower
TIMP-770	1 metre; or is equal	1 metre; or is equal to H in metres otherwise;
TIMP-771	• P is the weight	• P is the weight of the specific material that makes up the item, in kilograms;
TIMP-772	• Z is the vertical	• Z is the vertical coordinate of the geometric centre of the item, measured in metres from
TIMP-773	α MAT parameter for various	α MAT parameter for various materials Material αMAT Material αMAT Material αMAT AISI
TIMP-774	Magnetic-steel 4.35 Carbon Fibre 0.28	Magnetic-steel 4.35 Carbon Fibre 0.28 Bronze 2.66 Non Magnetic-steel 1.20 Monel 1.14 Nick
TIMP-750	4.5.2.3 Electrically Operated Equipment	
TIMP-775	In case of an electrically	In case of an electrically operated equipment, the following cases are given.
TIMP-776	4.5.2.3.1 AC Motor/Alternator of Power > 40kW	
TIMP-780	AC motor and alternator of	AC motor and alternator of power greater than 40kW shall be low stray field design accordi
TIMP-777	4.5.2.3.2 DC Equipment of Power > 0.7kW	
TIMP-781	DC operated equipment of power	DC operated equipment of power greater than 0.7kW like:
TIMP-782	• DC motor	• DC motor
TIMP-783	• DC power supply	• DC power supply
TIMP-784	• Battery charger	• Battery charger
TIMP-785	• Uninterruptible Power Supply (UPS)	• Uninterruptible Power Supply (UPS)
TIMP-786	• Electronic Soft-Start	• Electronic Soft-Start
TIMP-787	• Electronic Power Converter	• Electronic Power Converter
TIMP-788	Shall be DC low stray	Shall be DC low stray field design according to MIL-HDBK-802(SH), Design of Electrical Equi
TIMP-778	4.5.2.3.3 Battery Arrangements	
TIMP-789	Batteries arrangements and specifically their	Batteries arrangements and specifically their cabling shall be designed and manufactured i
TIMP-779	4.5.2.3.4 Other Electronic Equipment	
TIMP-790	Any other electronic equipment not	Any other electronic equipment not already mentioned in paragraph 4.5.2.3.2 above can be c
TIMP-791	SFSAI = (W)□ +	SFSAI = (W)□ + D + H Power 2.5□(Z + 6) 3 □ 1
TIMP-792	• W is the width	• W is the width of the electronic equipment as oriented on board (i.e. its base dimension alo
TIMP-793	• D is the depth	• D is the depth of the electronic equipment as oriented on board (i.e. its base dimension alo
TIMP-794	• H is the height	• H is the height of the electronic equipment as oriented on board (i.e. its height dimension a
TIMP-795	• Power is the absorbed	• Power is the absorbed power by the electronic equipment, in watts;
TIMP-796	• Z is the vertical	• Z is the vertical coordinate of the geometric centre of the electronic equipment, measured
TIMP-751	4.5.2.4 Vendor Documentation	
TIMP-797	For items/equipment to be supplied	For items/equipment to be supplied which are acceptable according to the requirements set
TIMP-752	4.5.2.5 Magnetic Acceptance Test	

TIMP-798	Magnetic acceptance test shall be	Magnetic acceptance test shall be conducted on each item/equipment in order to verify that
TIMP-799	To this scope, a visual	To this scope, a visual inspection shall be therefore performed and a permeability meter or
TIMP-744	4.5.3 Specific Requirements	
TIMP-800	Should the General Requirements (section	Should the General Requirements (section 4.5.2) be not applicable for an item/equipment of
TIMP-801	The following requirements clearly hypothesizes	The following requirements clearly hypothesizes that item/equipment Vendor is also its des
TIMP-802	4.5.3.1 Ferromagnetic Materials with Mechanical Functions	
TIMP-807	As a general rule, use	As a general rule, use of ferromagnetic parts/components is only admissible when they prov
TIMP-808	Should the item/equipment contain any	Should the item/equipment contain any ferromagnetic part, the preliminary list of all these i
TIMP-809	Should the item/equipment contain ferromagnetic	Should the item/equipment contain ferromagnetic parts having not an electrical function, th
TIMP-810	Such lists shall be complete	Such lists shall be complete and updated on responsibility of the Vendor as necessary to cor
TIMP-811	Parts individually identified in the	Parts individually identified in the deperming list shall be in general issued to the Shipy
TIMP-812	A magnetic signature test shall	A magnetic signature test shall be generally conducted as acceptance test on the complete i
TIMP-813	Should the magnetic test be	Should the magnetic test be performed by the Shipyard as part of the acceptance process aft
TIMP-803	4.5.3.2 Items/Equipment not Fulfilling ECSAI Criteria	
TIMP-814	Should the item/equipment do not	Should the item/equipment do not meet the ECSAI criteria of section 4.5.2.2.1 concerning ec
TIMP-815	Should the Shipyard, upon delivered	Should the Shipyard, upon delivered documentation analysis, request design modifications (
TIMP-816	Final layout agreement shall be	Final layout agreement shall be enclosed to this specification and shall be used as reference
TIMP-817	4.5.3.2.1 Definition of the ECSII of an Item/Equipment	
TIMP-818	ECSII means Eddy Current Source	ECSII means Eddy Current Source Inclusion Index and is defined as follows:
TIMP-819	ECSII = Φ MAT ΦW	ECSII = Φ MAT ΦW Φ D Φ P (Z + 6) 3
TIMP-820	• α MAT is a	• α MAT is a parameter of the specific material that makes up the item, whose values are list
TIMP-821	• W is the width	• W is the width of the item as oriented on board (i.e. the item base dimension along the long
TIMP-822	• D is the depth	• D is the depth of the item as oriented on board (i.e. the item base dimension along the tran
TIMP-823	• P is the weight	• P is the weight of the specific material that makes up the item, in kilograms;
TIMP-824	• Z is the vertical	• Z is the vertical coordinate of the geometric centre of the item, measured in metres from
TIMP-804	4.5.3.3 Electrically Operated Equipment not Compliant with General Requirements	
TIMP-825	Should the equipment be of	Should the equipment be of the type listed in paragraphs 4.5.2.3.1, 4.5.2.3.2 or 4.5.2.3.3, o
TIMP-826	The Vendor shall demonstrate the	The Vendor shall demonstrate the accomplishment of the above analysis and minimization p
TIMP-827	stray field) and minimization process	stray field) and minimization process (i.e. description of design and construction choices im
TIMP-828	A magnetic signature test shall	A magnetic signature test shall be generally conducted as acceptance test on the complete e
TIMP-829	Upon magnetic testing on a	Upon magnetic testing on a first equipment, the specific equipment (and others similar in fit
TIMP-830	Components containing ferromagnetic parts with	Components containing ferromagnetic parts with pure electric and/or electromechanical fu
TIMP-805	4.5.3.4 Vendor Documentation	
TIMP-831	The Vendor shall provide all	The Vendor shall provide all the applicable documentation, as identified case by case in the s
TIMP-832	List of ferromagnetic parts (μ≥2.0	List of ferromagnetic parts (μ≥2.0);
TIMP-833	List of parts to be	List of parts to be magnetically treated (depermed);
TIMP-834	Documentation for item/equipment exceeding ECSAI	Documentation for item/equipment exceeding ECSAI criteria and final layout agreement (if
TIMP-835	Report on magnetic stray field	Report on magnetic stray field analysis and minimization process or test report.
TIMP-806	4.5.3.5 Magnetic Acceptance Test	
TIMP-836	Specific magnetic acceptance test shall	Specific magnetic acceptance test shall be performed on each item/equipment in order to ve
TIMP-745	4.5.4 Case of COTS	
TIMP-837	Should the equipment be a	Should the equipment be a COTS, a specific procurement process shall be followed in order t
TIMP-838	Therefore, the following steps shall	Therefore, the following steps shall be followed:
TIMP-839	Step 1. Preliminary Magnetic Information	Step 1. Preliminary Magnetic Information Data: All the following available data/information
TIMP-840	a) Name, description	a) Name, description
TIMP-841	b) Rated or estimated electric	b) Rated or estimated electric power, voltages and absorbed currents, as applicable
TIMP-842	c) Envelope dimensions (H x	c) Envelope dimensions (H x W x D, as installed)
TIMP-843	d) Total weight	d) Total weight
TIMP-844	e) Naval program or onboard	e) Naval program or onboard application where the specific item (or a very similar equipme
TIMP-845	f) Applicable references to magnetic	f) Applicable references to magnetic standard or specification, if any:
TIMP-846	1. for design and construction,	1. for design and construction,
TIMP-847	2. for testing,	2. for testing,
TIMP-848	If magnetic testing certification and	If magnetic testing certification and results are available and provided, no other datum/ info
TIMP-849	g) Material of external envelope:	g) Material of external envelope:
TIMP-850	2. LL, aluminum alloy	2. LL, aluminum alloy
TIMP-851	3. MS, magnetic steel	3. MS, magnetic steel
TIMP-852	5. NM2, other non-magnetic non-metallic	5. NM2, other non-magnetic non-metallic material (fiberglass, plastics, wood, etc.)
TIMP-853	h) Estimated total weight of	h) Estimated total weight of ferromagnetic material (external envelope excluded)
TIMP-854	i) Typology of ferromagnetic internal	i) Typology of ferromagnetic internal parts which contribute to point g above (indicate whic
TIMP-855	1. mechanical components (shafts, gears,	1. mechanical components (shafts, gears, etc.)
TIMP-856	2. electrical components (transformers, motors,	2. electrical components (transformers, motors, etc.)
TIMP-857	3. cases (internal and/or partial)	3. cases (internal and/or partial) , supports, carpentries, etc.
TIMP-858	Step 2. Preliminary magnetic test	Step 2. Preliminary magnetic test on sample COTS: a magnetic signature test on a sample sh
TIMP-859	Step 3. COTS approval for	Step 3. COTS approval for use by the Magnetic Manager: an anticipated approval for use of t
TIMP-860	Step 4. COTS procurement definition	Step 4. COTS procurement definition
TIMP-861	4.5.4.1 Vendor Documentation	
TIMP-863	Besides what above specified, no	Besides what above specified, no other magnetic documentation is required to the Vendor.
TIMP-862	4.5.4.2 Magnetic Acceptance Test	
TIMP-864	Concerning magnetic testing, at the	Concerning magnetic testing, at the end of step 4 (COTS procurement definition) and accord
TIMP-746	4.5.5 Reference Earth Magnetic Field	
TIMP-865	The degaussing system as well	The degaussing system as well as all the design and technical activity in the magnetic area s
TIMP-747	4.5.6 Magnetic Signature Measurement	
TIMP-866	All the item that not	All the item that not fulfill the above mentioned magnetic requirement shall be tested at LB
TIMP-867	The signature measurements shall be	The signature measurements shall be performed at least for the geomagnetic magnetic field
TIMP-868	Event Ambient (simulated) Magnetic Field	Event Ambient (simulated) Magnetic Field Hx (nT) (1) Hy (nT) (1) Hz (nT) Note 1 0 0 0 Zero
TIMP-869	(1) x and y axis	(1) x and y axis refer to EUT longitudinal and transversal axis, respectively. Test certificate
TIMP-870	Measured data of the three	Measured data of the three components (Bx, By and Bz) of all the events listed in the above t
TIMP-871	The shipyard shall be informed	The shipyard shall be informed (3 weeks before) of the magnetic testing schedule for each e
TIMP-722	4.6 SHOCK	
TIMP-872	4.6.1 General Requirement	
TIMP-877	The ship system shock requirements	The ship system shock requirements depend on the system shock class.
TIMP-878	The term “system” is meaning	The term “system” is meaning all the equipments (e.g.: machineries, electrical panels, junctio
TIMP-879	The list of the items	The list of the items to be shock qualified shall be defined by the shipyard iaw the SoS of the
TIMP-873	4.6.2 Shock class A	
TIMP-880	Shock class A systems are	Shock class A systems are those essential to the safety and continued combat capability of th
TIMP-881	The integrity and functionality of	The integrity and functionality of equipments, components and accessories that belong the s
TIMP-882	The hull mounted equipments, components,	The hull mounted equipments, components, accessories and the part of the scope of supply t
TIMP-883	Equipments, components and accessories for	Equipments, components and accessories for which will be demonstrated, and accepted by t
TIMP-884	The shock qualification of a	The shock qualification of a series of equal equipments or components or accessories shall b
TIMP-885	Equipments, components and accessories that	Equipments, components and accessories that have been already shock qualified iaw MIL S
TIMP-874	4.6.3 Shock class B	
TIMP-886	Shock class B systems are	Shock class B systems are those for which an eventual operative failure not impair the safet
TIMP-887	The integrity and functionality of	The integrity and functionality of equipments, components and accessories that belong the s
TIMP-888	The shock qualification of a	The shock qualification of a series of equal equipments or components or accessories shall b
TIMP-889	Equipments, components and accessories that	Equipments, components and accessories that have been already shock qualified iaw MIL S
TIMP-875	4.6.4 Shock class C	
TIMP-890	Shock class C systems are	Shock class C systems are item not essential the safety and the ship combat capability (e.g.:
TIMP-891	The anchoring to the on-board	The anchoring to the on-board foundation of the shock class C system shall be demonstrated
TIMP-876	4.6.5 Elastic mounts requirements	
TIMP-892	The metallic components of the	The metallic components of the elastic mounts shall be made of non-magnetic materials.
TIMP-893	The maximum allowed deflection in	The maximum allowed deflection in each direction for the machineries connected to the on-
TIMP-894	Electrical panels that weigh less	Electrical panels that weigh less than 200kg and machineries that weigh less than 500kg sha

TIMP-895	A different model types, but	A different model types, but with the same performances of those listed in the table, can be
TIMP-896	Electrical panels over 200kg and	Electrical panels over 200kg and machineries over 500kg shall be isolated by suitable elasti
TIMP-897	When machinery or equipment has	When machinery or equipment has been already qualified iaw MIL S 901 D shall be supplied
TIMP-898	Option #1 #2 #3 Mounting	Option #1 #2 #3 Mounting type¦ Supplier¦ Vulkan Caribul Vibrostop Weight [kg]¦ M
TIMP-723	4.7 NOISE AND VIBRATION 4.7.1 General Requirement	
TIMP-899	The list of the items	The list of the items to be qualified for noise and vibration shall be defined by the shipyard
TIMP-900	4.7.2 Environmental and self-induced vibration requirements	
TIMP-901	4.7.3 Airborne and structureborne noise requirements	
TIMP-724	4.8 RECYCLED, RECOVERED, OR ENVIRONMENTALLY PREFERABLE MATERIALS	
TIMP-902	Recycled, recovered, or environmentally preferable	Recycled, recovered, or environmentally preferable materials should be used to the maximu
TIMP-725	4.9 DESIGN AND CONSTRUCTION	
TIMP-903	4.9.1 General	
TIMP-909	Materials chosen shall be compatible	Materials chosen shall be compatible with a sea environment and shall not be placed in com
TIMP-910	Materials shall be selected in	Materials shall be selected in accordance with Para. 4.5.2.2.
TIMP-904	4.9.2 REACH Regulation - "Materials"	
TIMP-911	The Supplier must ensure, in	The Supplier must ensure, in accordance with the precautionary principle, that the supplie
TIMP-912	The Supplier is obliged to	The Supplier is obliged to take all actions necessary to ensure that the supply complies with
TIMP-913	Since the Shipyard qualifies as	Since the Shipyard qualifies as a "downstream user" under the REACH Regulation, at the tim
TIMP-914	a) a Declaration of Conformity	a) a Declaration of Conformity of Materials to the REACH Regulation stating:
TIMP-915	– to be aware of	– to be aware of the obligations imposed by the "REACH Regulation" to all producers, impor
TIMP-916	– to have fulfilled the	– to have fulfilled the above-mentioned obligations and to have verified that potential subco
TIMP-917	b) if the above-mentioned substances	b) if the above-mentioned substances exceed 1 ton/ year, a "Certificate of Conformity", ind
TIMP-918	– EINECS code/EC number and	– EINECS code/EC number and CAS of all substances, pure or in compounds; – total weight c
TIMP-919	c) list of "identification codes"	c) list of "identification codes" of the supplied products / materials containing dangerous su
TIMP-920	d) should article 31 of	d) should article 31 of the REACH Regulation not apply, the Shipyard must be provided with
TIMP-921	e) in case the supply	e) in case the supply relates to articles as defined in Article 3, no. 3) of the REACH Regul
TIMP-922	f) in case of unfulfillment	f) in case of unfulfillment of lit. e) above, the supplier engages to provide timely informat
TIMP-923	A lack in producing the	A lack in producing the REACH Regulation documents will entail the refusal of the supply.
TIMP-905	4.9.3 System Safety	
TIMP-924	The Vendor shall be responsible	The Vendor shall be responsible for the safety content of its quoted scope of supply and for
TIMP-906	4.9.4 Piping materials Piping materials shall be as follows:	
TIMP-925	1. Lube and Hydraulic Oil	1. Lube and Hydraulic Oil - Stainless Steel AISI 316,
TIMP-926	2. Seawater Cooling - CuNi	2. Seawater Cooling - CuNi 90/10,
TIMP-927	3. Drainage - CuNi 90/10	3. Drainage - CuNi 90/10 (alternative plastic materials may be considered),
TIMP-928	Compressed Air – Copper.	Compressed Air – Copper.
TIMP-929	Flexible hoses shall be certified	Flexible hoses shall be certified iaw "NAV-70-4730-0003-13-00B000 - Normativa tubi flessil
TIMP-907	4.9.5 Thermal Insulation for Piping and Machinery	
TIMP-930	Generally, piping which radiates heat	Generally, piping which radiates heat shall be insulated where possible so that the external
TIMP-908	4.9.6 Lifting Devices	
TIMP-931	The Vendor shall design attachment	The Vendor shall design attachment points for lifting for equipment of weight greater than 5
TIMP-726	4.10 ILS REQUIREMENTS	
TIMP-932	The ILS Requirements will be	The ILS Requirements will be described in a devoted ILS Technical Specification.
TIMP-727	4.11 SAFETY	
TIMP-933	All working activities, all Equipment,	All working activities, all Equipment, Systems, Sub-Systems, Machinery and Devices (hereina
TIMP-934	The Vendor and/or its Sub-Suppliers	The Vendor and/or its Sub-Suppliers (Manufacturers, Labour Subcontractors, ...) are respon
TIMP-935	All hazards defined in the	All hazards defined in the technical standards that are applicable to the risk assessment pro
TIMP-936	The supplier/productor has to declare	The supplier/productor has to declare the absence of Synthetic Vitreous Fibers (SVFs) of the
TIMP-937	All the hazards and the	All the hazards and the risks conditions for operators related with the "Equipment" and "Sys
TIMP-938	The Vendor and/or its Sub-Suppliers	The Vendor and/or its Sub-Suppliers shall ensure with their own safety organization (Safety
TIMP-488	ELECTRICAL INTERFACE AND REQUIREMENTS	
TIMP-489	Electric interface requirements	
TIMP-939	4.12.1.1 General	
TIMP-945	The electrical plant, the components	The electrical plant, the components and related interfaces, including the electric users, s
TIMP-946	The ship shall have an	The ship shall have an electrical unearthed system (IT System) without the distributed neut
TIMP-947	• 690 Vac, 60 Hz,	• 690 Vac, 60 Hz, 3 phase, 3 wire (generated power)
TIMP-948	• 440 Vac, 60 Hz,	• 440 Vac, 60 Hz, 3 phase, 3 wire (transformed power)
TIMP-949	• 115 Vac, 60 Hz	• 115 Vac, 60 Hz 3 phase and 2 phase (transformed power)
TIMP-950	• 230 Vac, 60 Hz	• 230 Vac, 60 Hz 3 phase and 2 phase (transformed power) – only for lighting, service socket
TIMP-951	• 24 Vdc, (rectified/battery power),	• 24 Vdc, (rectified/battery power), 2-wire, isolated poles with no connection (galvanic isol
TIMP-952	All consumers shall use preferably	All consumers shall use preferably 690 VAC or 24 VDC voltage and voltage conversion/trans
TIMP-953	Unlike metal vessels, a ground	Unlike metal vessels, a ground network is designed and installed onboard FRP vessels, like t
TIMP-954	All ground connections of the	All ground connections of the equipment's shall be made through single conductor, with mir
TIMP-955	Each equipment and all circuits	Each equipment and all circuits shall be protected from short circuit currents and thermal o
TIMP-956	In general, the circuit breakers	In general, the circuit breakers shall protect the circuit lines against the power overload.
TIMP-940	4.12.1.2 Quality of power supply	
TIMP-957	The quality of the energy	The quality of the energy supplied to users shall comply with:
TIMP-958	• RINA/RINAMIL, as a minimum	• RINA/RINAMIL, as a minimum requirement for energy at 60Hz;
TIMP-959	• STANAG 1008 (in the	• STANAG 1008 (in the latest applicable revision) for 60Hz and for low voltage DC supplies.
TIMP-941	4.12.2 Electrical safety requirements	
TIMP-960	The equipment and components of	The equipment and components of the electrical system shall be provided with the CE marki
TIMP-942	4.12.3 Electric equipment	
TIMP-961	All machinery, equipment and materials	All machinery, equipment and materials included in the electrical system on board shall be
TIMP-962	Each equipment/component shall be suitable	Each equipment/component shall be suitable for operation in marine environment conditio
TIMP-963	The main characteristics of the	The main characteristics of the electrical equipment and accessories are:
TIMP-964	1) maximum safety during operation;	1) maximum safety during operation;
TIMP-965	2) minimum weight and dimensions;	2) minimum weight and dimensions;
TIMP-966	3) maximum resistance to corrosion,	3) maximum resistance to corrosion, including saline humidity;
TIMP-967	4) the minimum number of	4) the minimum number of components;
TIMP-968	5) maximum reliability;	5) maximum reliability;
TIMP-969	6) minimum operating, maintenance and	6) minimum operating, maintenance and procurement costs;
TIMP-970	7) maximum interchangeability of the	7) maximum interchangeability of the components;
TIMP-971	8) maximum accessibility for inspection,	8) maximum accessibility for inspection, maintenance and repair;
TIMP-972	9) ease of repair by	9) ease of repair by the crew, with the minimum use of special tools;
TIMP-973	10) ease in the identification	10) ease in the identification of the components in order to facilitate their replacement and r
TIMP-974	11) simplicity and ease of	11) simplicity and ease of use.
TIMP-975	4.12.3.1 Electrical equipment data	
TIMP-983	The Supplier shall provide a	The Supplier shall provide a list of electrical components and, at least, the following electric
TIMP-984	a) General information of each	a) General information of each electrical parts of supply: o Power supply [kW, kVA] o Power
TIMP-985	b) Electrical motors characteristics: o	b) Electrical motors characteristics: o Manufacturer's model and size o Electrical rated po
TIMP-986	o Power factor [cosφ] o	o Power factor [cosφ] o Start currents [A] o Type of motor o Weight [kg] o Rated speed [R
TIMP-987	o Contribution of the motor	o Contribution of the motor to the three-phase short circuit current according to IEC 61363
TIMP-988	o Enclosure [IP] o Duty	o Enclosure [IP] o Duty o Class of insulation /temp rise o Overload capabilities [%, s] c) S
TIMP-976	4.12.3.2 Electric motors	
TIMP-989	The electric motors shall be	The electric motors shall be three-phase asynchronous type with short-circuited rotor and
TIMP-990	The motors shall be insulated	The motors shall be insulated according to class F, as a minimum, and designed in order to
TIMP-991	All electric motors (excluding main	All electric motors (excluding main or auxiliary propulsion) shall comply with the requirem
TIMP-992	The sizes of the electric	The sizes of the electric motors shall be merged as far as possible, in order to reduce the siz
TIMP-993	The electric motor installed inside	The electric motor installed inside the superstructure and in the machinery and auxiliary ro
TIMP-994	When necessary, the electric motors	When necessary, the electric motors installed on open decks or otherwise located in humid
TIMP-995	Each motor shall have a	Each motor shall have a thermistor/corresponding relay in the relevant starter panel.
TIMP-977	4.12.3.3 Starters	
TIMP-996	In general, star/delta type starters	In general, star/delta type starters shall be provided for motors of 1 kW or more.

TIMP-997	The starters of large motors	The starters of large motors (≥100kW or ≥2% of the rated power of the smallest main energ
TIMP-998	The starter shall be equipped	The starter shall be equipped with an interlock preventing the door opening during operati
TIMP-999	The starter shall be equipped	The starter shall be equipped with a thermal relay for the overload protection and a phase fa
TIMP-1000	For electronic starter, the protection	For electronic starter, the protection functions could be performed by a starter management
TIMP-1001	When operating the motor by	When operating the motor by a portable push-buttons, the maximum voltage of the portable
TIMP-1002	If requested by the contractual	If requested by the contractual specification, the starters shall be fitted for remote control
TIMP-1003	1) line switch	1) line switch
TIMP-1004	2) contactor	2) contactor
TIMP-1005	3) overload relay	3) overload relay
TIMP-1006	4) phase failure contactor opening	4) phase failure contactor opening device
TIMP-1007	5) start/stop push-buttons	5) start/stop push-buttons
TIMP-1008	6) run/stop signal lamp	6) run/stop signal lamp
TIMP-1009	7) ammeter (for power over	7) ammeter (for power over 10kW or for particular users e.g. turning gear)
TIMP-1010	8) local/remote command selector (if	8) local/remote command selector (if required)
TIMP-1011	9) manual/automatic selector (if required)	9) manual/automatic selector (if required)
TIMP-1012	It shall be possible to	It shall be possible to connect the starters with a power higher than 5kW to the ship platfor
TIMP-1013	– Voltage, – Current,	– Voltage, – Current,
TIMP-1014	– Power factor, – Active	– Power factor, – Active power, – Reactive power, – Alarms.
TIMP-1015	For system safety and maintenance	For system safety and maintenance reasons, the use of centralized starter panels (Motor Cor
TIMP-1016	All motor driven machinery shall	All motor driven machinery shall be preferably electrically supplied at 690Vac 60Hz 3 phase
TIMP-978	4.12.3.4 Electrical equipment designating and marking	
TIMP-1017	The electrical equipment on board	The electrical equipment on board shall be marked with:
TIMP-979	4.12.3.5 Degree of protection of enclosures	
TIMP-980	4.12.3.6 Equipment to be installed in spaces with an explosion hazard	
TIMP-981	4.12.3.7 Electrical diagram of the equipment	
TIMP-982	4.12.3.8 Colors of the indicating lights and push-buttons	
TIMP-943	4.12.4 Electric cables	
TIMP-1018	4.12.4.1 Electrical cables and connections	
TIMP-1019	4.12.4.2 Electrical cables designating and marking	
TIMP-944	4.12.5 Control And Monitoring	
TIMP-490	Signal Denomination	
TIMP-1020	4.13 EMI REQUIREMENTS 4.13.1 General	
TIMP-1021	4.13.2 General shielding requirements and design criteria	
TIMP-1022	4.13.3 Performance requirements	
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