

BALLAST WATER MANAGEMENT

ERMA FIRST BWTS

Certification

Retrofit Cases

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✤ Electrolysis:

Disinfectant is Chlorine

- I. Full Flow systems
- II. Side stream systems

✤ <u>UV Disinfection:</u>

UV-C light inactivates the microorganisms present in the water

✤ Chemical Injection:

Disinfecting agent to eliminate marine organisms is injected

• <u>Ozone Disinfection:</u>

Ozone breaks down the forms of organic compounds





BALLAST WATER TREATMENT = SEPARATION + DISINFECTION BATTAST MATER TREATMENT = SEBARATION + DISINFECTION



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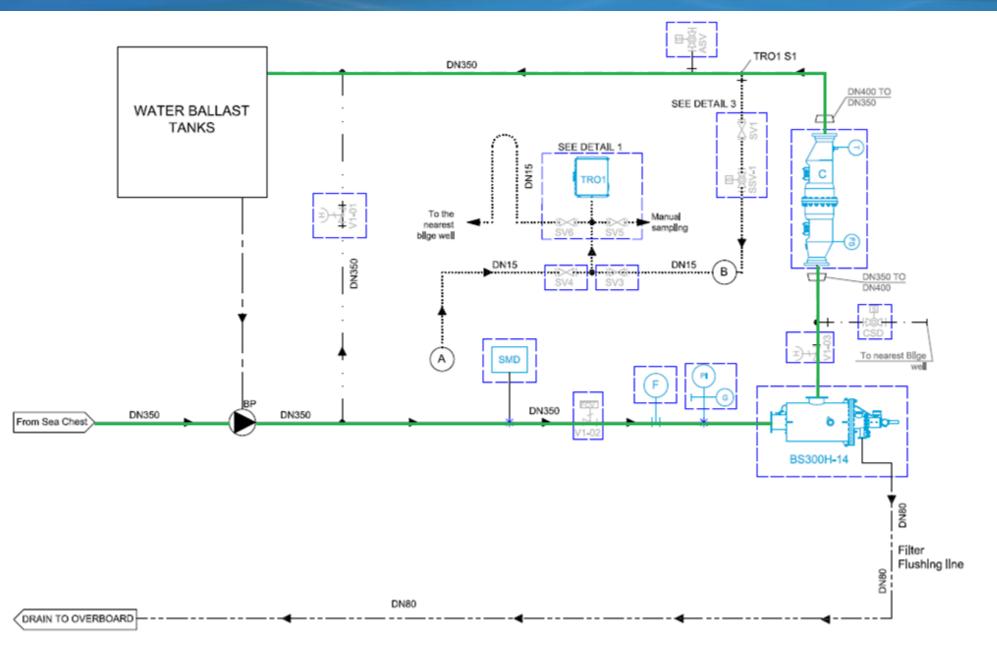


ERMA FIRST FIT BWT System

ERMA FIRST FIT BWTS	Stage	Components		
<image/>	Separation	Option 1 Filtersafe: 40 microns self- cleaning automatic screen filter Option 2 Filtrex: 40 microns self- cleaning automatic screen filter		
	Disinfection	Advanced Technology Electrolysis Cells TRO Concentration 4-6 mg/L		



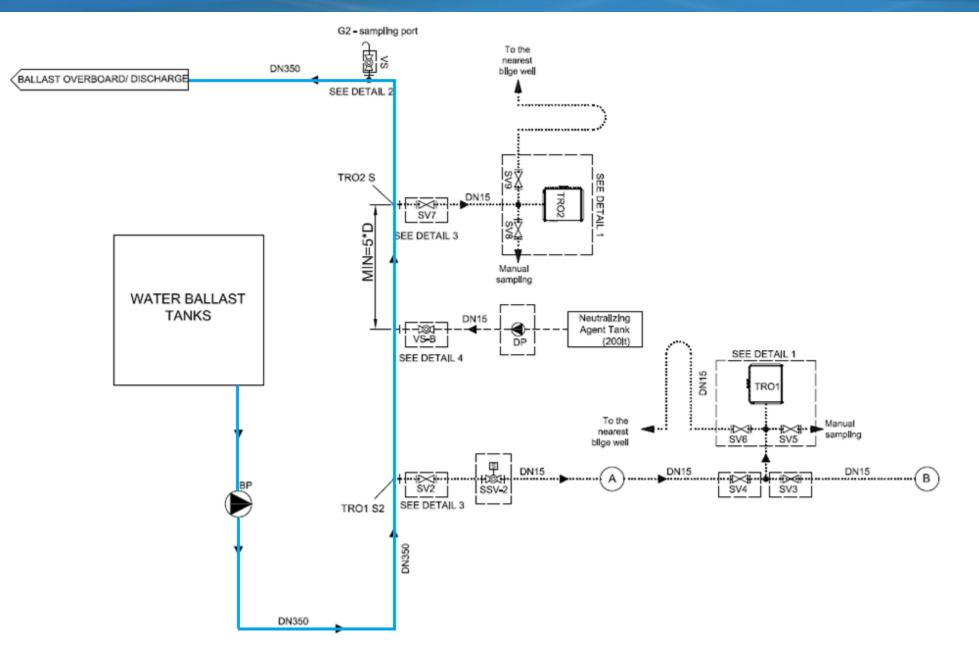
Ballasting – BWTS 1X





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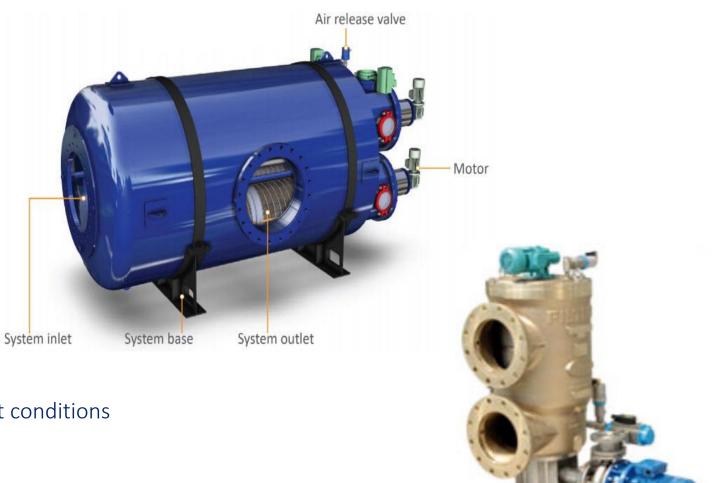
Deballasting – BWTS 1X





High End Filtration

- o Screen: Sintered
- o Screen Material: SS316 or 904L
- $\circ~$ Filtration grade: >40 μm
- o Pressure Drop: 0.05-0.5 bar
- Capacity : 50 ~ 3,740 m³/h
- o Installation position: Vertical / Horizontal
- o Explosion proof type available
- o Uninterrupted operation under heavy sediment conditions
- o Minimum inlet pressure 0.5bar
- o Automatic cleaning





○ Full Flow Type

ERMA FIRST

- Low energy consumption
- Negligible pressure loss
- Small footprint
- Vertical or horizontal installation
- $\circ \ \ \, \text{No corrosion risk}$
- No acidic cleaning (CIP) is required
- Electrodes lifetime exceed 5000 operation hrs
- $\circ~$ Fresh water operation according to IMO & USCG standards
- $\circ~$ Very low Hydrogen production that requires no special handling
- o Made in Sweden

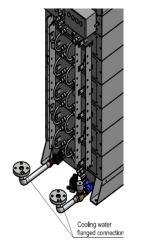


Sodium Hypochlorite (Chlorine) is produced at a max concentration of 6mg/Lit

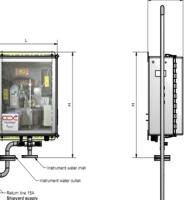


Peripherals

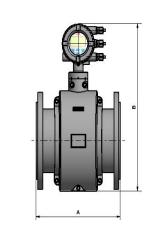
Transformer Rectifier •







Flow Meter

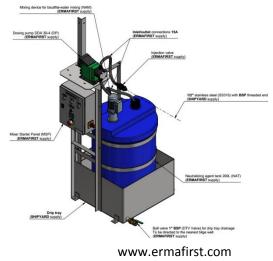


٠

Remotely operated ٠ Valve's positioner Ø8 copper tube network

Valve's body

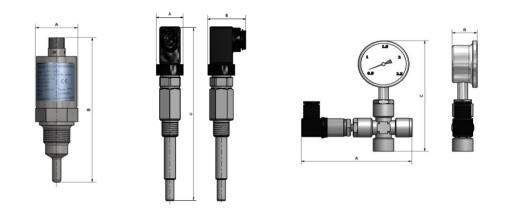
Neutralizing agent tank and ٠ dosing pump



- G2 Sampling point

Flow direction

Flow Switch / Temperature sensor / Pressure indicator



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Gearboxe Buttrfly Valv [V1-03]

Filter [F]

Air Shutter Valve [ASV]

ERMA FIRST BWTS FIT (Skid) Control Panel [CP1] Filter Starter Panel IMSP1 9 Power Supply Detail C 4 3 (35) Cell Shutter Drain Valve [CSD] Filter Drain ISO DN32 PN16 33 32 Electrolytic Cell Fit (20 Shutter Sampling Valve [SSV-1] Flow Meter

ERMA FIRST BWTS FIT (Loose)

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Certification:

- Grid of Rules IMO/Class Societies
- Follow updates (USCG)
- Translate New Requirements

ERMA FIRST BWTS System holds:

- IMO Type Approval by Lloyds/Greek Maritime Administration and Liberia Maritime Administration
- USCG AMS Acceptance
- CCS & ABS class type approval in progress
- ATEX vs IECEx ERMA FIRST BWT Systems are in full compliance with the IECEx requirements in order to be installed in hazardous locations of U.S. flag vessels.
- USCG Type Approval : Test completed, on the way to application

Потоловрыкой: 4243.9/01/12 tificate No.: 4245.9/01/12						
ΕΛΛΗΝΙΚΗ ΔΗΜΟΚΡΑΤΙΑ						
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MINISTRY OF DEVELOPH GENERAL SECRETARIA MERCHANT SHIPS INSP DESIGN AND CONSTRUCT	Régister	Г				
ΠΙΣΤΟΠΟΙΗΤΙΚΟ ΓΙΑ ΤΟ ΣΥΣΤΗΜΑ ΔΙΑΧΕΙΡΙΣΗΣ Θ.	Type Approval Certificat		U.S. Department of Homeland Security	andant States Coast Quend	2703 Martin Lutter King Jr. Ass. SE Weetington, DC 20305-7509 Statt Symbol: CG-0E5	
TYPE APPROVA OF THE ERMA FIRST BALLAST	This is to certify that the under relevant requirements of the Lloy	rnoted products have be d's Register Type Approv	United States Coast Guard		Phone: 202-372-1431 Fax: 202-372-1906 Email: Regina.R.Bergner@usog.mil	
παρόν πιστοποιεί ότι το σύστημα διαχείς	This certificate is issued to:				5760	
πωτέρω έχει εξεταστεί και δοκιμαστεί ποδιαγραφών που περιέχονται στις Οδηγίε	PRODUCER	ERMA FIRST ESK E			October 11, 2013	
ω IMO MEPC 174(58) και ΜΕΡC 169(57 απιμα διαχείρισης θαλασσίου ζρματος πο	PLACE OF PRODUCTION	Schisto Industrial Pa Block 13				
is is to certify that the ballast water m amined and tested in accordance with ntained in the Guidelines contained in the	PRODUCTION	Keratsiniou - Skaran 18863, Perama Greece	ERMA FIRST ESK Engineering Solution: Attn: Mr. Konstantinos Stampedakis	s SA		
9(57). This certificate is valid only for the below.	DESCRIPTION	ERMA FIRST Balla BWTS) using pre-fi	Schisto Industrial Park Block 13 Keratsiniou-Skatamagka Ave 18863 Perama			
στημα Διαχτίρισης Θαλασσίου Έρματος IGINEERING SOLUTION A.E.		disinfection with a n	Greece			
allast water management system suppli DLUTION SA,	TYPE	ERMA FIRST BWTS Treated rated capaci Maximum system w	ALTERNATE MANAGEMENT SYSTEM ACCEPTANCE			
ονομασία τύπου και μοντέλου και ενσωμ WTS 50-3000 με δυνατότητα ονομαστικ		System temperature Pressure loss: 1.2 ba Minimum salinity co	The Coast Guard has completed its review			
ider type and model designation and incor sated rated capacity 50-3000 m ³ /h.	APPLICATION	For treatment of ship	application submitted by ERMA FIRST BWTS ballast water treatment system (BWTS). This letter grants AMS acceptance in accordance with the requirements of 33 CFR 151.2026 for the following ERMA FIRST BWTS models:			
στημα Διαχείρισης Θαλασσίου έρματος						
BK ENGINEERING SOLUTION A.E., allast water management system manufac DLUTION SA,	SPECIFIED STANDARDS	Lloyd's Register Ru Ships Part 5 and Par	• BWTS 50, BWTS 100, BWTS 300, BWTS 300, BWTS 400, BWTS 500, BWTS 600, BWTS 600, BWTS 100, BWTS 200, BW			
αρθμό σχεδίων εξοπλισμοù/συναρμολόγ alfast water treatment system (Pipin προμηνία 29/11/2011 ,						
RMA FIRST BWTS 200_Assembly rptpt RMA FIRST BWTS 700_Assembly rptpt	Certificate No.	12/00063	Construction Directorate certaican	e number 4245.9/01/1.	2 ISSUEG TO MAY 2012.	
equipment/assembly drawing No.: Illast water treatment system (Piping 8	Issue Date	5 October 2012	The ERMA FIRST BWTS Ballast Water Treatment Systems (BWTS) are assigned the following AMS identification number:			
W11/2011, RMA FIRST BWTS 200 Assembly date 2	Expiry Date	4 October 2017	COLO INCOMPANION DEIDORT.			
MA FIRST BWTS 700_Assembly date 2	Sheet	1 of 6	AMS-2013- ERMA FIRST Ballast	t Water Treatment Sys	tem-001	
	Lloyd's Register EMEA 71 Fenchurch Street, London E	C3M 4BS	Coast Guasd acceptance of the ERMA FII conformance to or compliance with any of	ther Federal, state, or I	ocal water discharge effluent	
	Buy of Register Groups chines it, participant on a subdivision of their means on the closes at set 1 stops. The close 1 stops is taken and their means classes it is relation or the information or ackers in this document of honous Buy of hongs empty for the product of this information or ackers and in candidors set out in that contact.		limitations that may apply to the vessel or and locations within which it operates. Th all applicable laws, regulations, and treati provisions of the Vessel General Permit (Rodenticide Act of 1972, as amended (FII) requirements; and other applicable laws at	he owner and operator es, including the Clear VGP); the Federal Inse FRA); other Coast Gui	of the vessel must comply with Water Act and associated reticide, Fungicide, and	





Revised G8 Guideline

Existing G8 Guidelines

ines ETV/ USCG Final Rule

Harmonization Level

- Testing Facilities
- Testing at temperatures ranging from 0°C to 40°C
- Consecutive Testing
- System Design Limitations
- Challenge level of Total Suspended Solids (TSS)
- Definition of viability
- Bypass arrangement
- Scaling
- Self-monitoring
- Environmental test
- Installation Requirements following type approval
- Installation Survey & Commissioning Procedures





ERMA FIRST BWT Systems required **NO Changes** or any type of modification in order to start the tests for USCG Type Approval

- Overall design and systems configuration remained unchanged
 - Treatment process met all the requirements (IMO & USCG AMS)
 - Components where neither altered or replaced







Summary of Reference List

Systems sold: 198 (retrofit: 46) Tankers: 71 Bulkers: 63 Containers: 24 LPG:18 Car Carries: 7 Passenger/Yacht:8 Other:7













ENGINE ROOM ARRANGEMENT

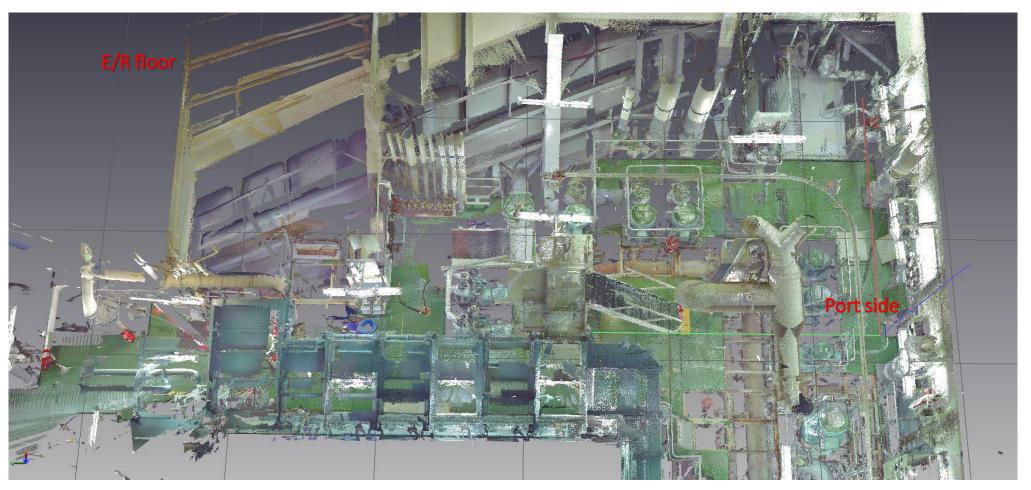








Piping & equipment arrangement in ENGINE ROOM

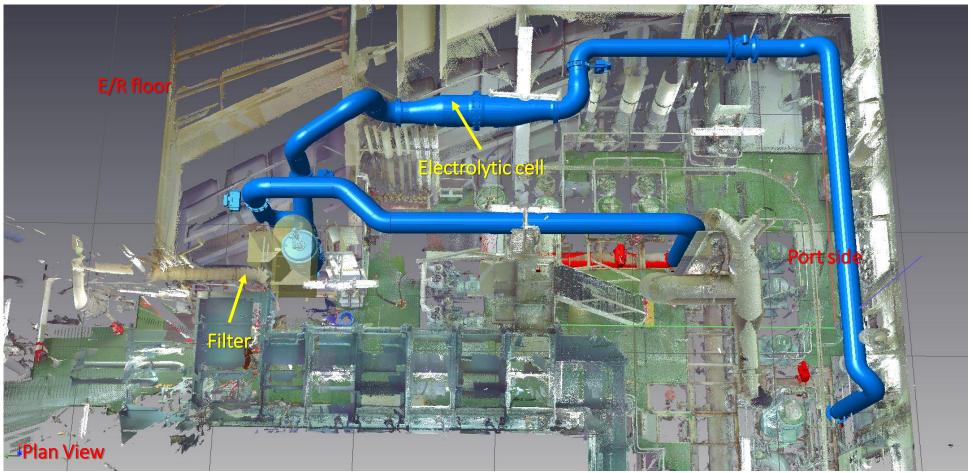


Plan View





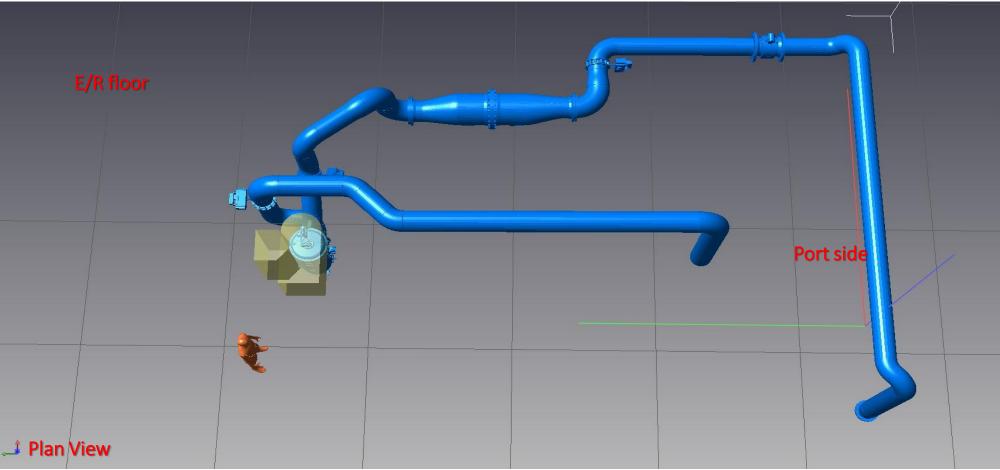




(yellow colored volume indicates required service space)







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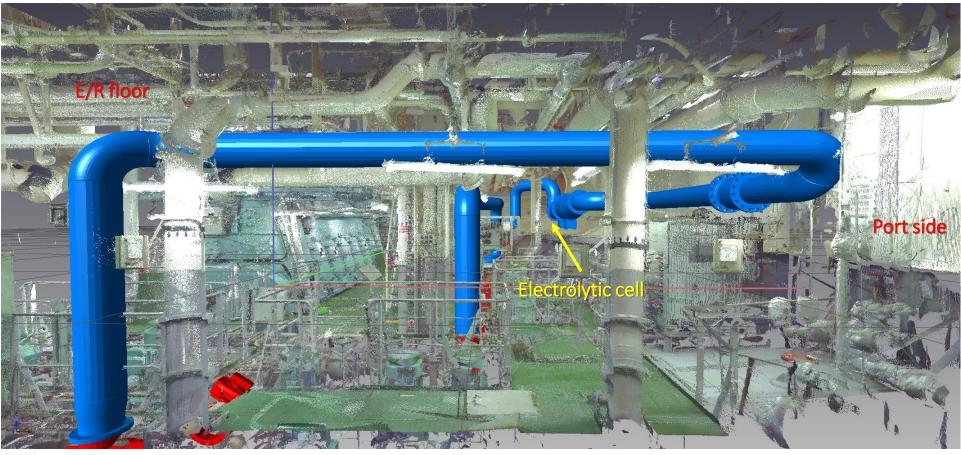












Looking Aft





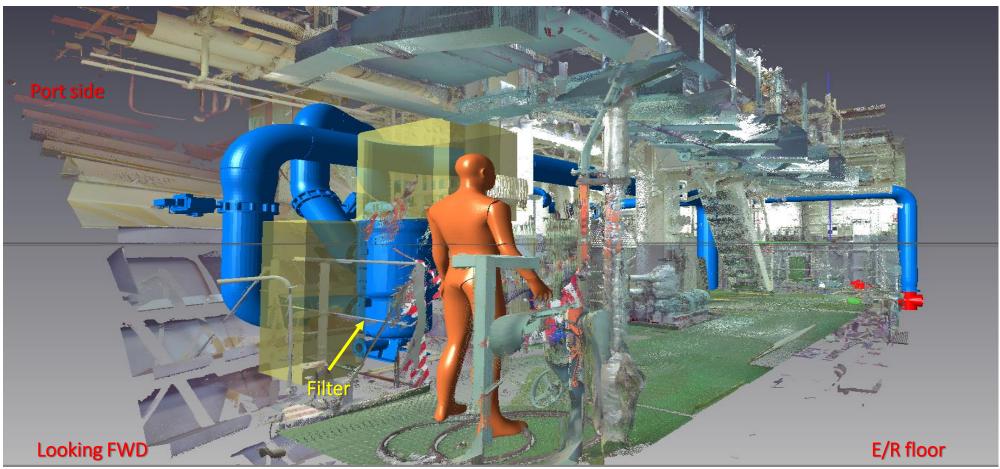








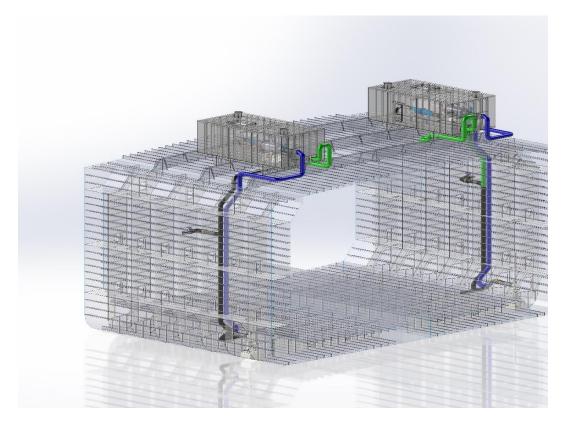


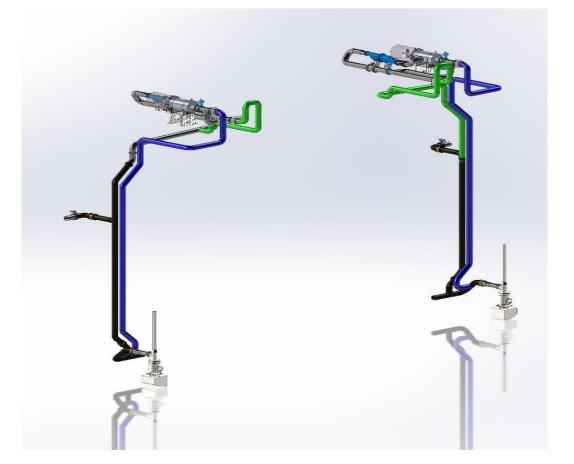


(yellow colored volume indicates required service space)







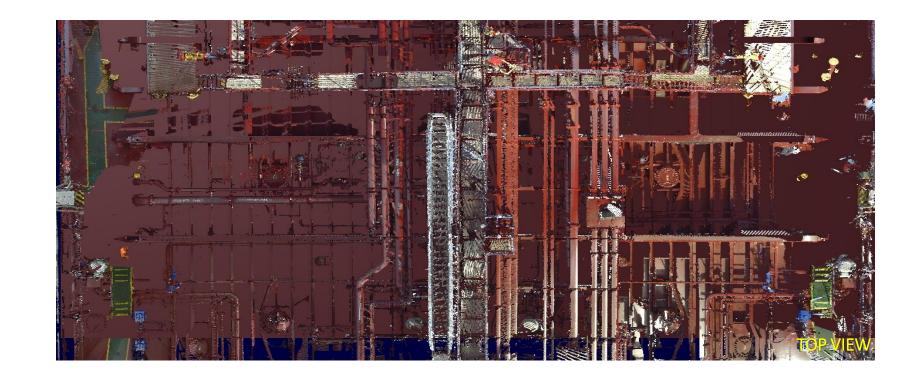






PORT

MAIN DECK – ERMA FIRST Treatment System on main deck



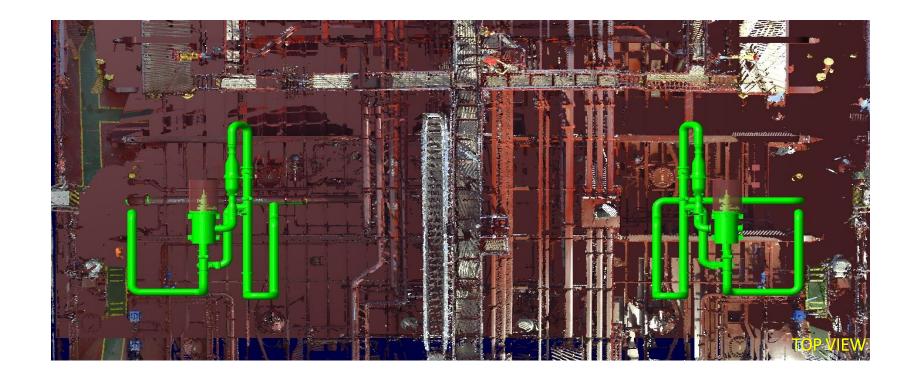






PORT

MAIN DECK – ERMA FIRST Treatment System





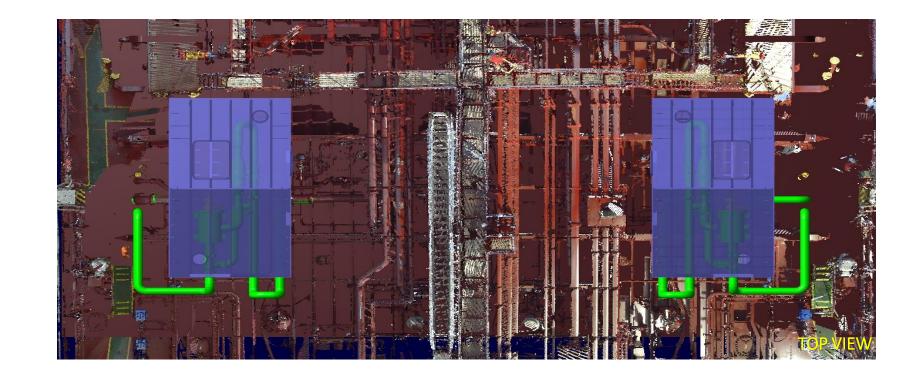
With pink color is indicated the minimum service space required





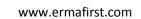
PORT

MAIN DECK – ERMA FIRST Treatment System

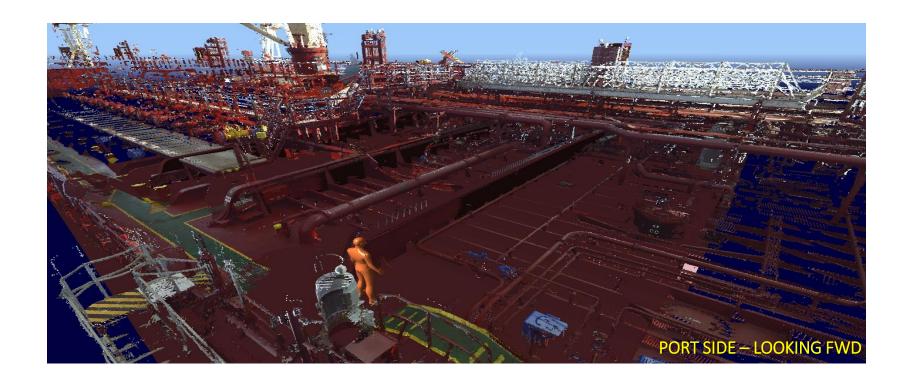


















With pink color is indicated the minimum service space required

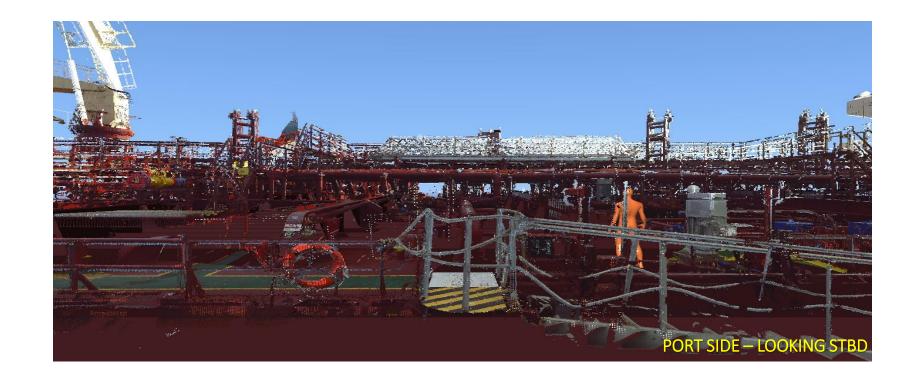




















FWD







FWD

With pink color is indicated the minimum service space required

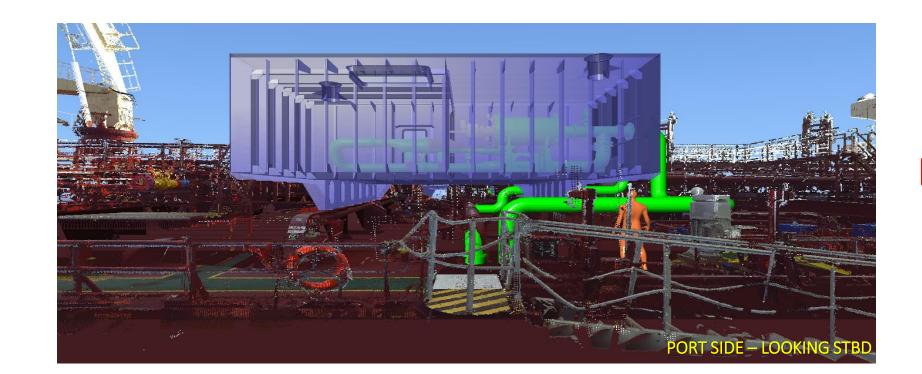


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FWD

MAIN DECK – ERMA FIRST Treatment System

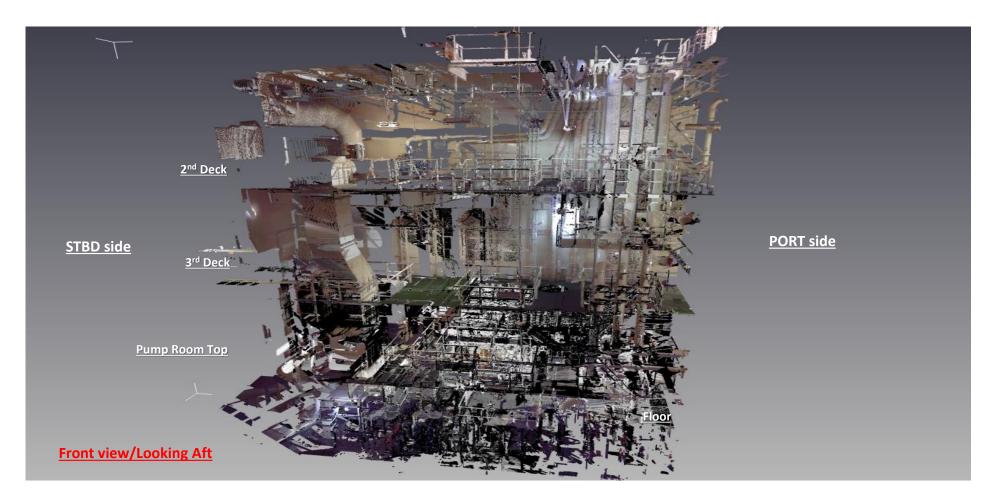








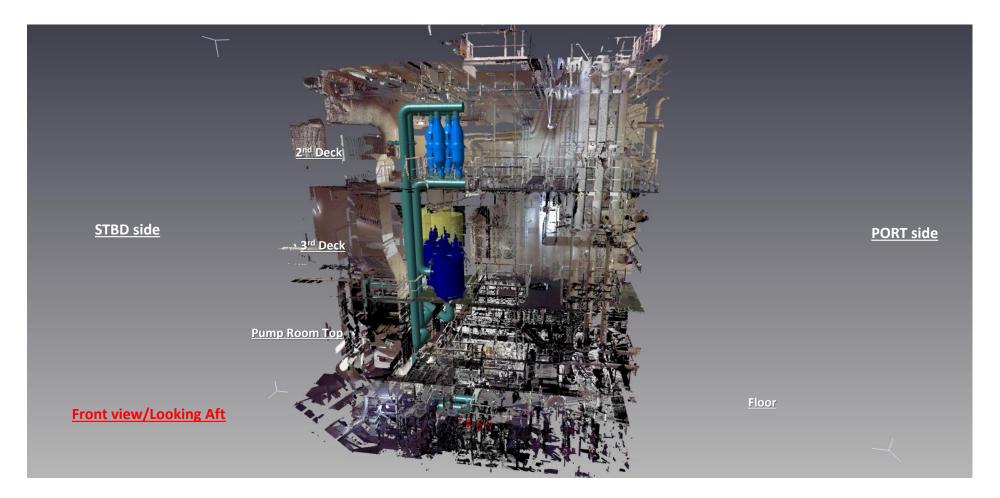
ERMA FIRST FIT PUMP ROOM INSTALLATION







ERMA FIRST FIT PUMP ROOM INSTALLATION

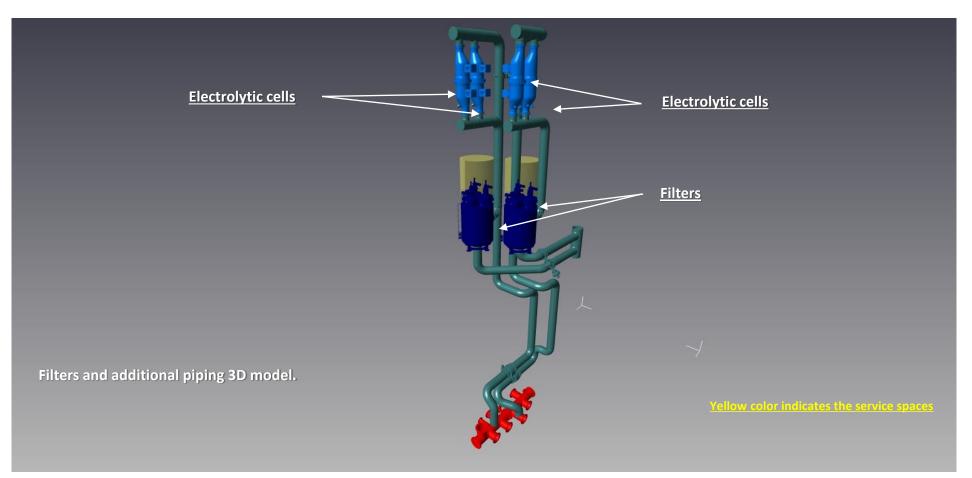






3D Model ERMA FIRST FIT

Pump Room Installation







Local Stations for Preliminary Inspection & Service

- Japan
- Korea
- China
- Philippines
- Singapore
- India (Sri Lanka)
- Dubai
- Denmark (Scandinavia)
- Greece
- Houston U.S.
- Tampa U.S
- Spain
- Netherlands
- Romania (Black Sea)
- Germany
- Lithuania (Baltic)





Thank you for your kind attention

