Ballast Water Treatment System – d'Amico service experience

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May 21, 2019

Academy

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“US” vs “Rest of the world”

COMPLIANCE MODE

EXPERIANCE-BUILDING PHASE

“US” vs “Rest of the world”

	US	Rest of the World
Approach	*Enforcement Mode*	*Experiance-Building phase*
Reporting requirement in case of non compliance	*Nearest COTP* *COTP of the next port call* *ENOA (electronic notice of arrival -96 hours prior)* *Report (ballast water management report) to NBIC (national board inspection code- 6 hours- no later 6 hours after arrival)* *Company* *Flag administration* *Class* *Manufacturers*	*Local Port authority* *Company* *Flag administration* *Class* *Manufacturers*
Sampling (Under VGP)	*Periodical analysis according the type of plant*	*NA*

“US” vs “Rest of the world” Cont’d

	USCG	Rest of the world
Contingency measures	*1. No BW discharge;* *2. Use only potable water from a U.S public water system, **if available*** and only if the ballast tanks are cleaned from previous sediment;* *3. Discharging to the facility onshore or to another vsl for purpose of – treatment, **if available***;* *4. Discharge of water outside of US territorial water(12 Nm from nearest land).*	*1.Ballast water exchange carried out to an approved plan to meet the standard D1.* *2.Managing the ballast water or a portion of it in accordance with a method acceptable to port state;* *3. Operational actions, such as modifying sailing or ballast water discharge schedules (i.e vsl equipped with two WBTS in case of failure of one plant can use the second one reducing the deballasting rate), internal transfer of ballast water or the retention of ballast water on board the ship according stress and stability calculation.*

“US” vs “Rest of the world” Cont’d

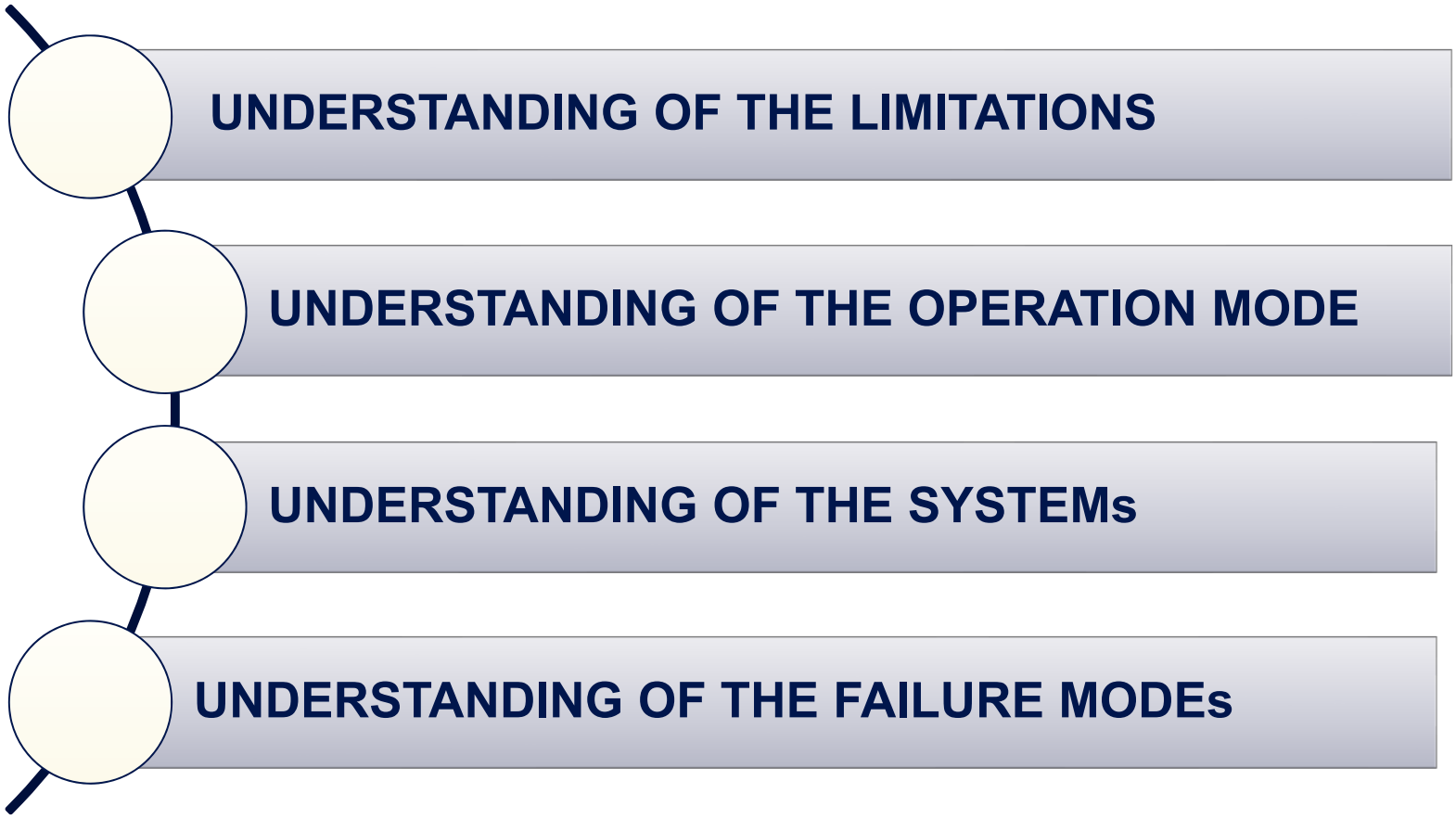
	USCG	Rest of the world
Contingency measures	*1. No BW discharge;* *2. Use only potable water from a U.S public water system, **if available*** and only if the ballast tanks are cleaned from previous sediment;* *3. Discharging to the facility onshore or to another vsl for purpose of – treatment, **if available***;* *4. Discharge of water outside of US territorial water(12 Nm from nearest land).*	*1.Ballast water exchange carried out to an approved plan to meet the standard D1.* *2.Managing the ballast water or a portion of it in accordance with a method acceptable to port state;* *3. Operational actions, such as modifying sailing or ballast water discharge schedules (i.e vsl equipped with two WBTS in case of failure of one plant can use the second one reducing the deballasting rate), internal transfer of ballast water or the retention of ballast water on board the ship according stress and stability calculation.*

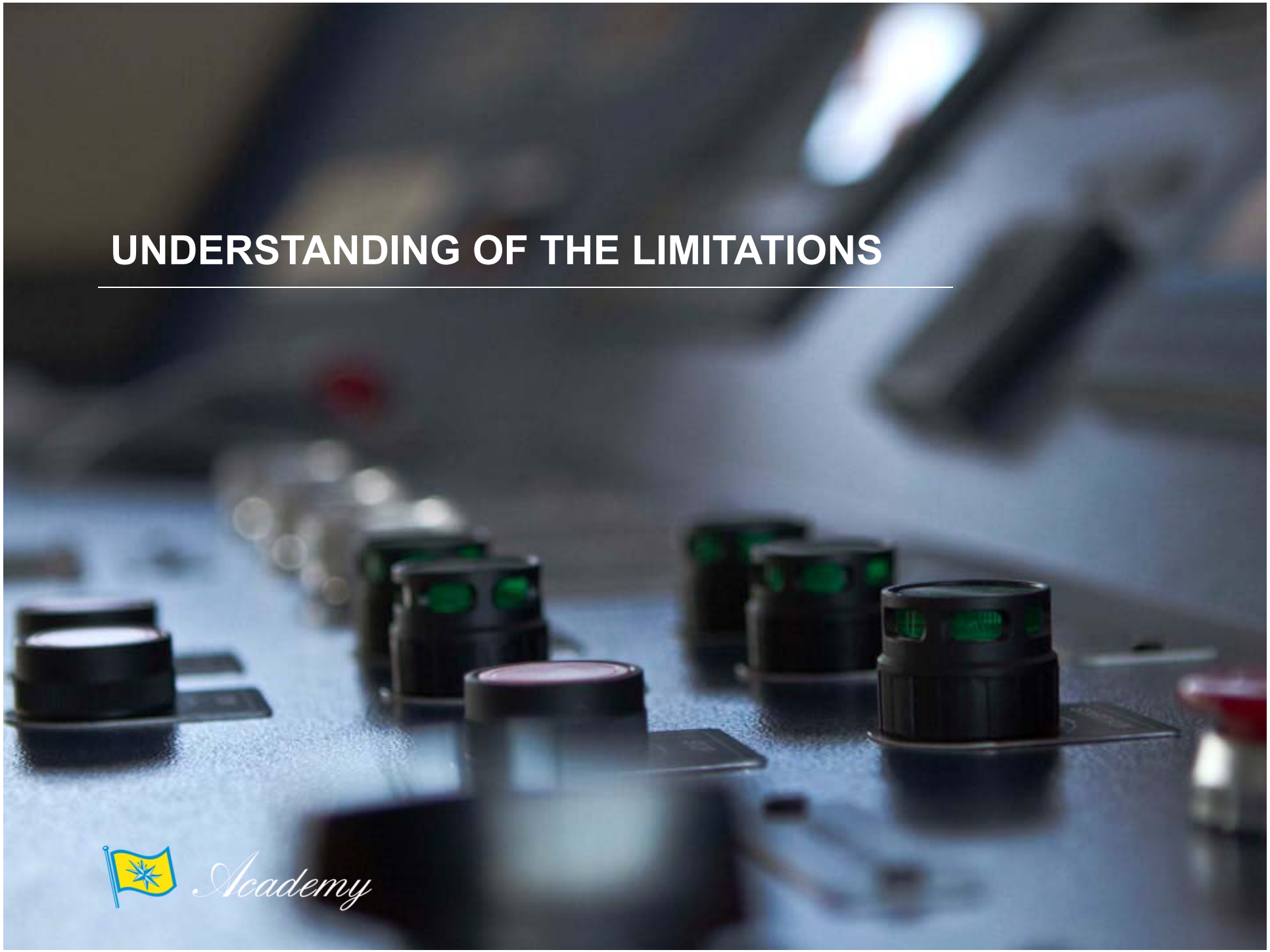
“US” vs “Rest of the world” Cont’d

	USCG	Rest of the world
Contingency measures	*5. Any other method allowed by COTP and under direction of COTP (i.e. Ballast water exchange if the BWMP is approved for BWE and only after authorization by COTP at 200 nm from the baseline).*	*4. Discharging ballast water to another ship or to an appropriate shipboard or land-based reception facility, **if available*;***
Investigation	*Finalized to confirm the “**unexpectedly unavailability**” of plant and the involvement of makers supported by evidence of communications in order to repair the plant*	*NA*

Plants Knowledge

Plants knowledge




UNDERSTANDING OF THE LIMITATIONS
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Understanding of the system limitation for US Trading

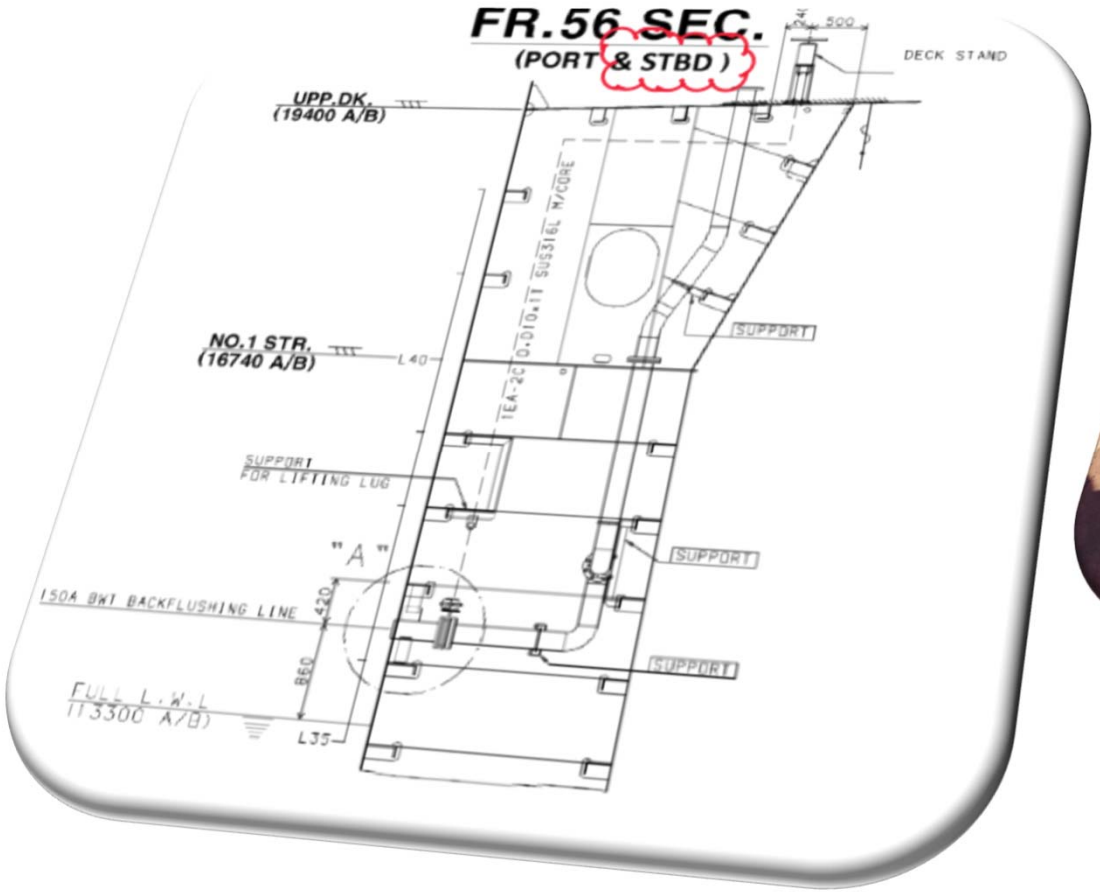
Maker/Type	Technology	Salinity (psu)	T °C	Holding time (Hours)	UV Intensity (W/m2)	Filter inlet pressure (bar)	TRO (mg/l)
Headway OCEAN GUARD HMT	FULL FLOW (Mechanical filtration + Electrolysis)	>0.85 (electrolyte)	0 - 40 (SW)	24(SW) 120(FW)	N/A	>1.5	2
PAN ASIA GloEn-Patrol	Mechanical filtration + UV	NA	-2 - 40 (SW)	>48	>900 (100% TRC) >600 (50% TRC)	>1	NA
Tech Cross ECS	FULL FLOW Electroclorination	1.5 (electrolyte)	0 - 45°C (ambient)	120	NA	NA	9
SunRui BALCLOR BC3000	SIDE STREAM (Mechanical filtration +Electrolysis)	>15 (electrolyte)	>5 (electrolyte)	NA	NA	>1.6	7.5

FW Storage capacity for tank cleaning

Voyage Planning

Understanding of the system limitation at terminal

System installed on the main deck with only one backflushing line is subject to the letter of protest by terminal if vsl is berthed on the side where the back flushing line is fitted.



UNDERSTANDING OF THE OPERATION MODE

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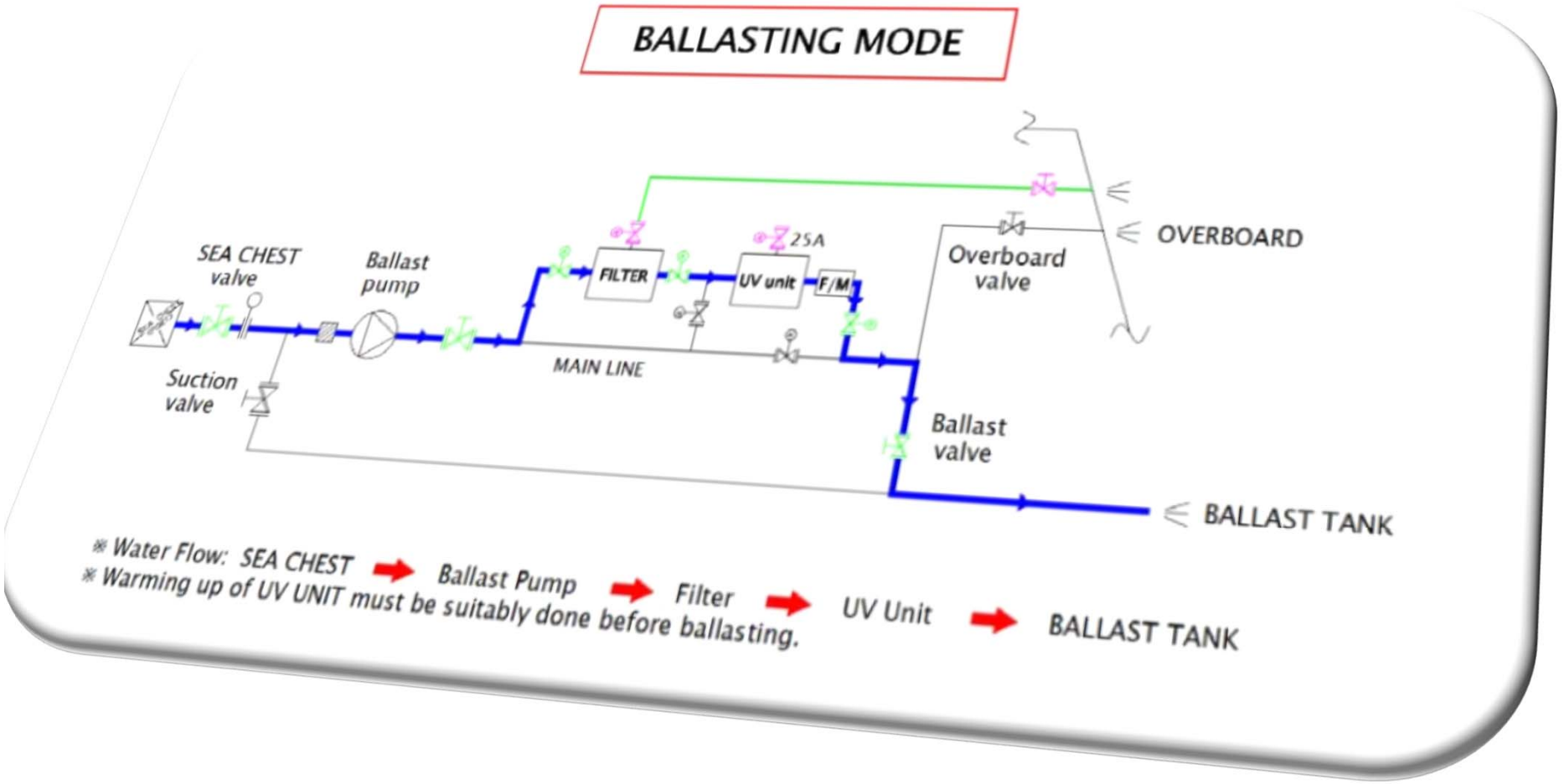
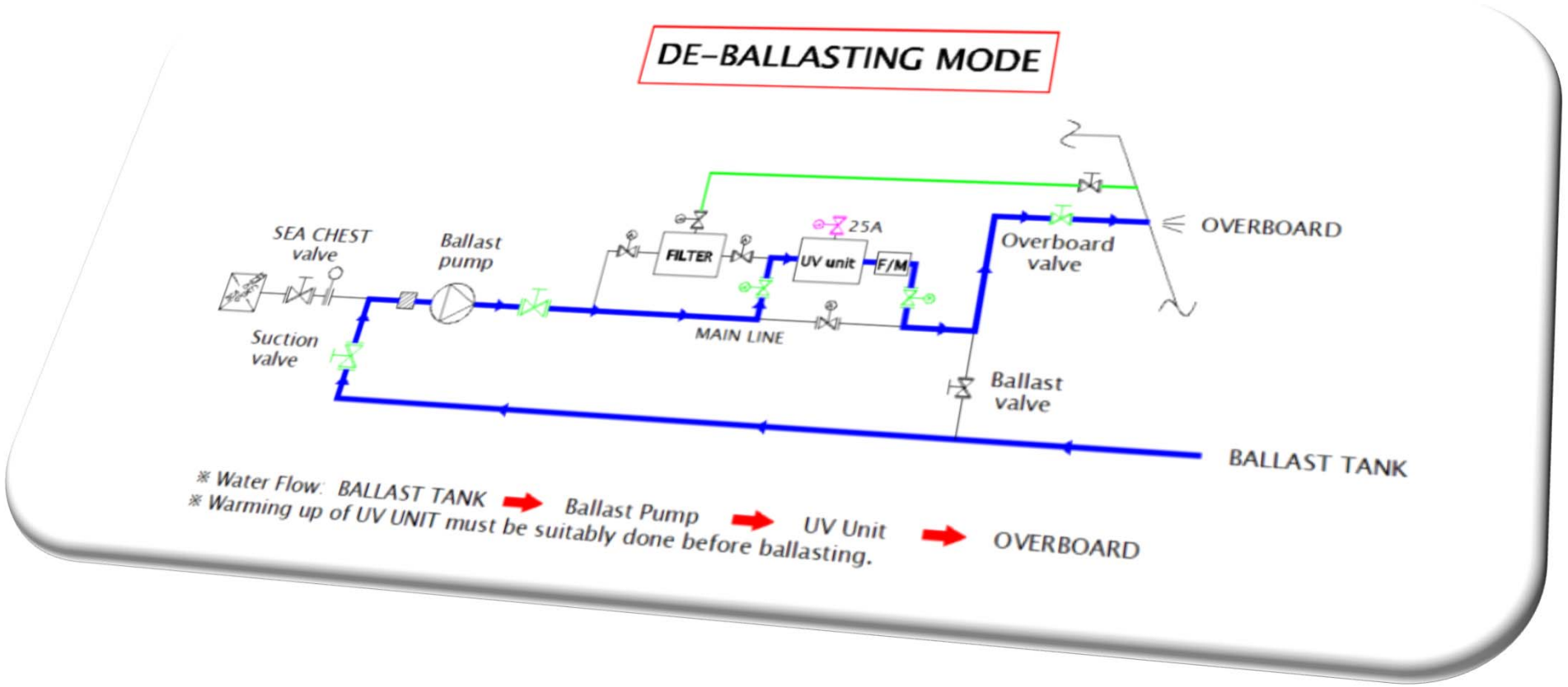
Understanding of the operation mode

Panasia UV type



Understanding of the operation mode (Cont'd)

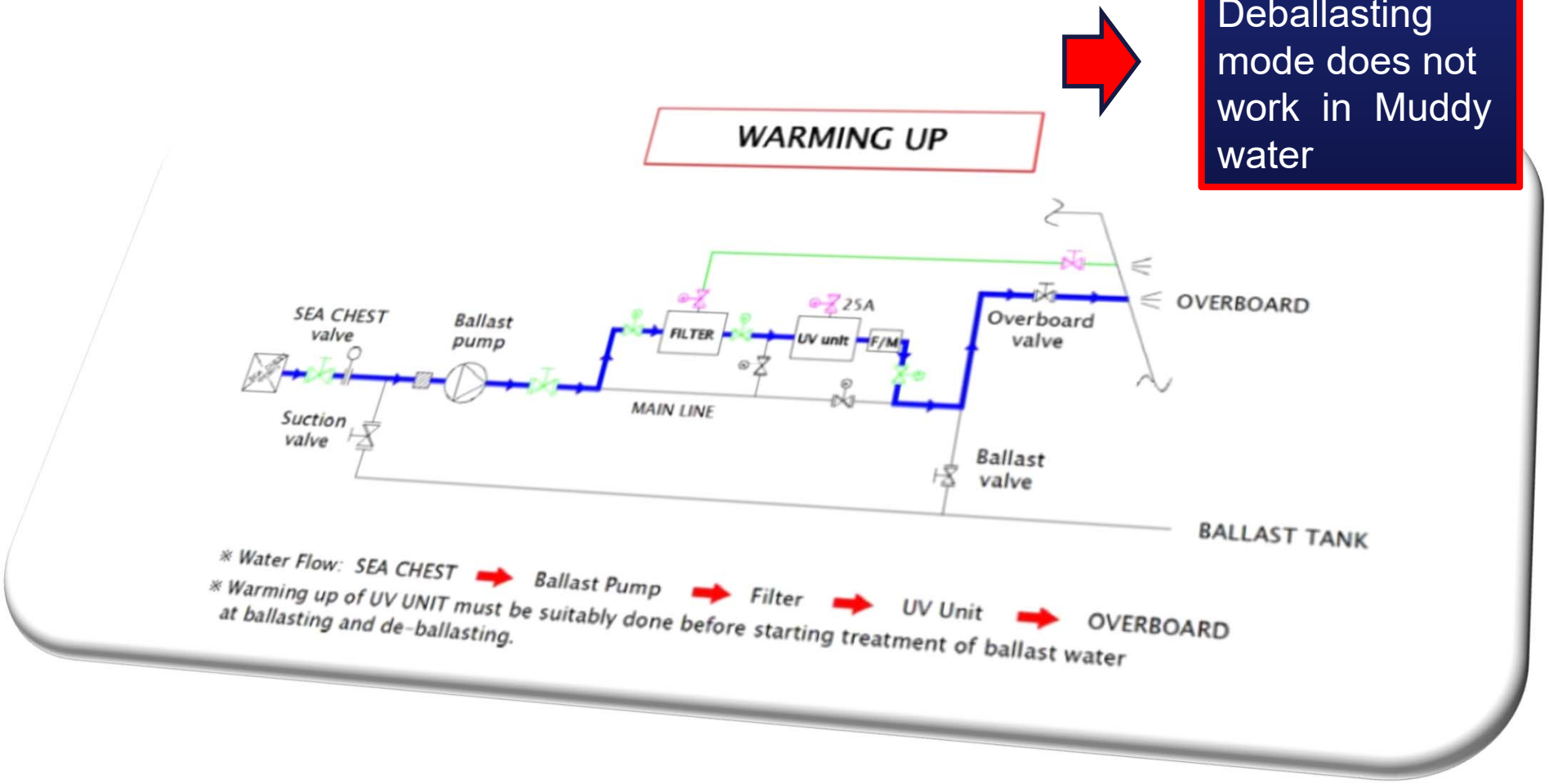
Panasia UV type



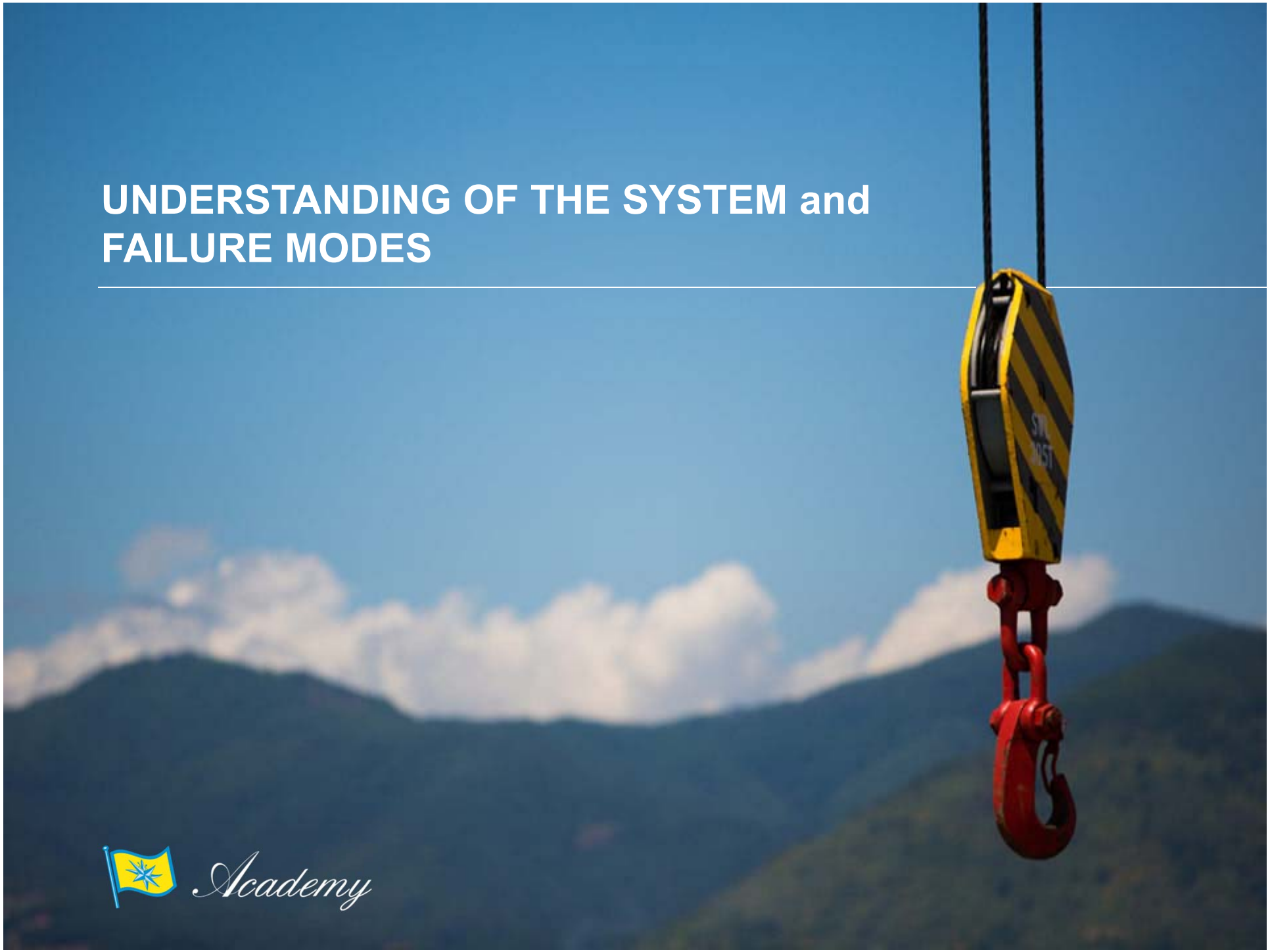
Understanding of the operation (Cont'd)

Panasia UV type

Deballasting mode does not work in Muddy water



UNDERSTANDING OF THE SYSTEM and FAILURE MODES



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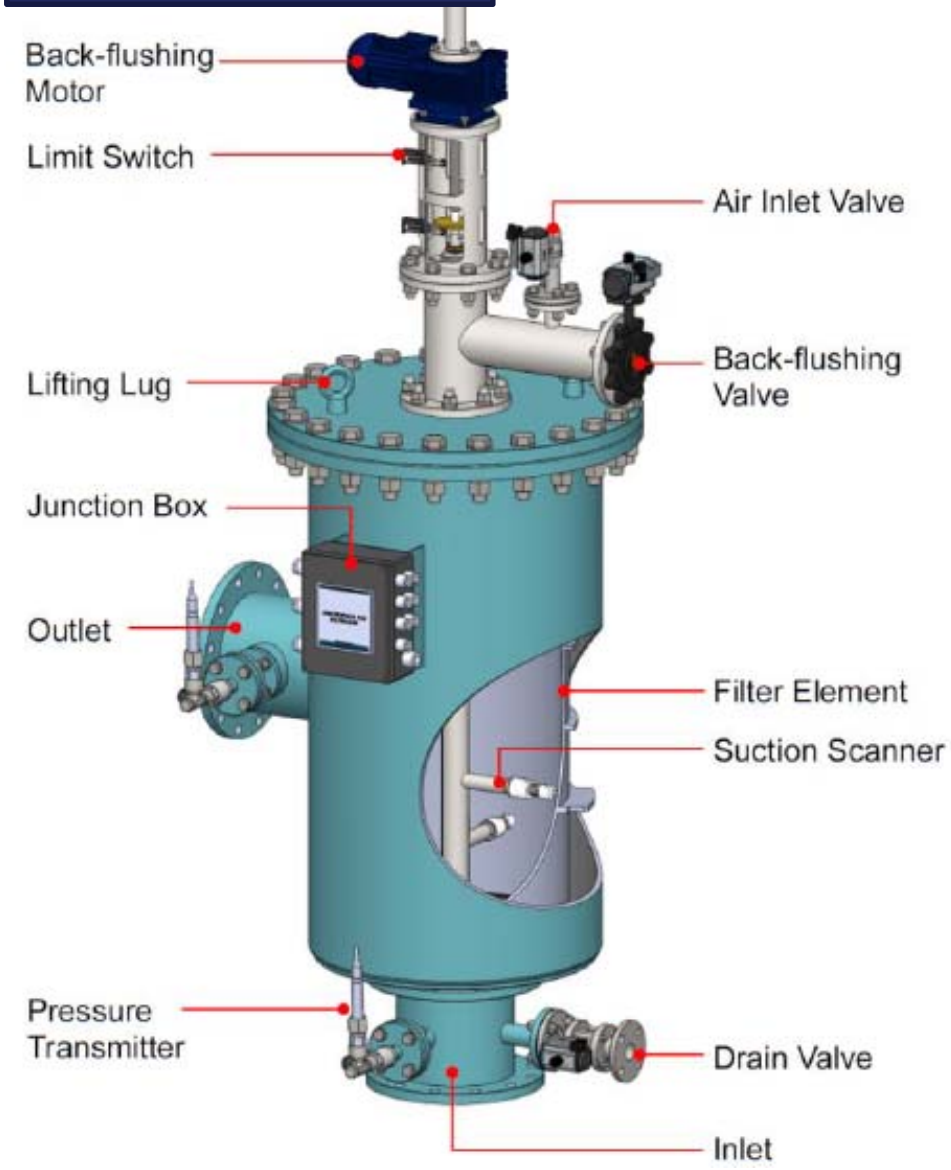
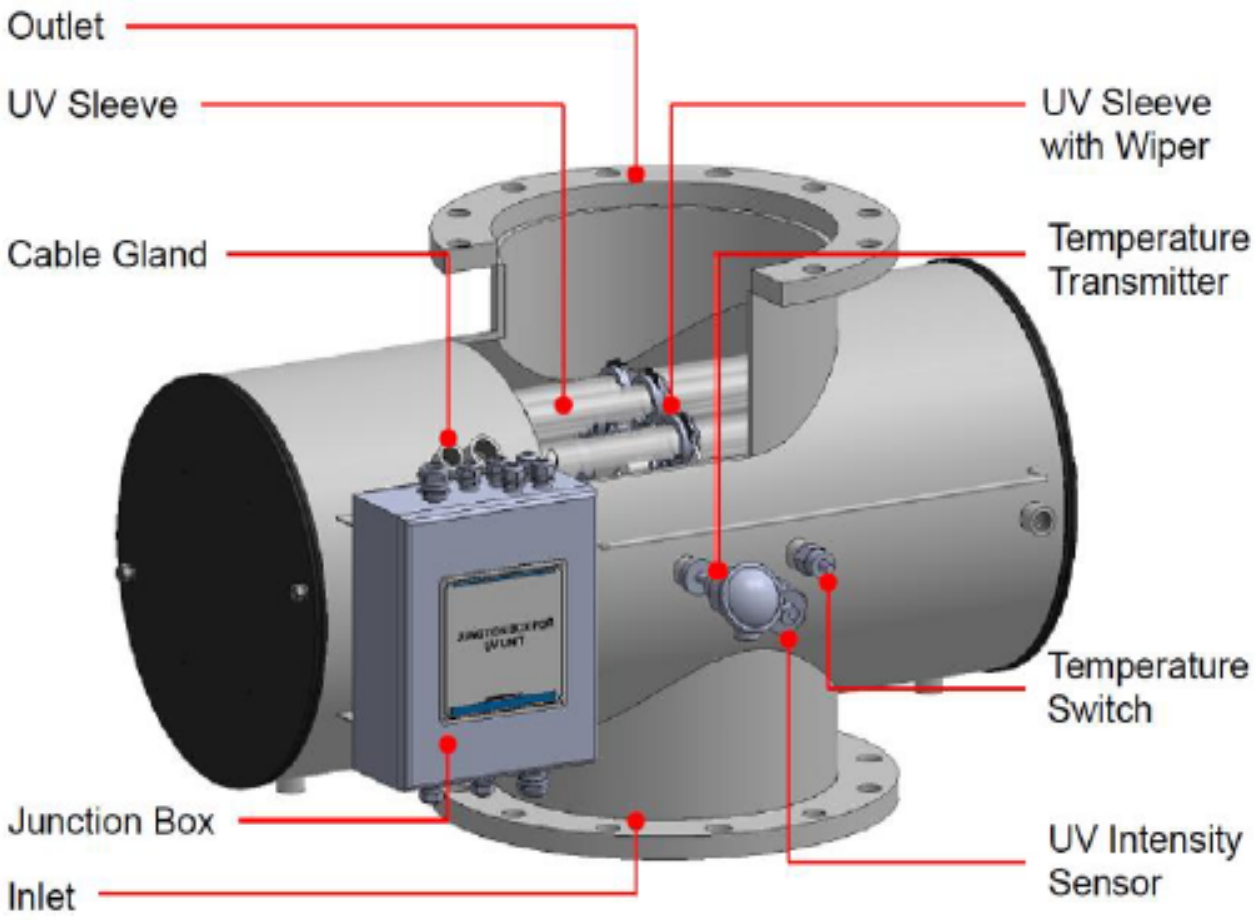
Understanding of the system

Panasia UV type

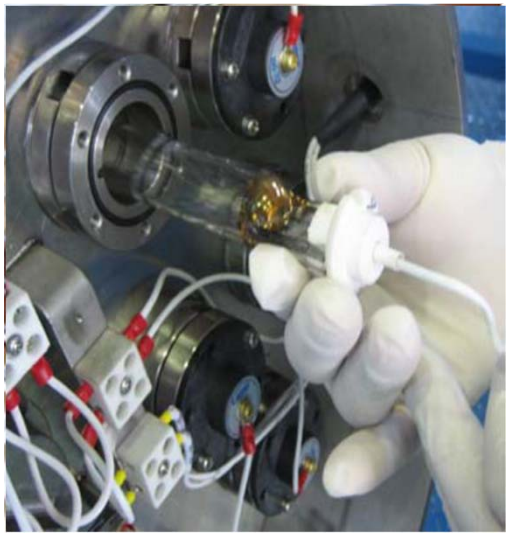


Understanding of the system (cont'd)

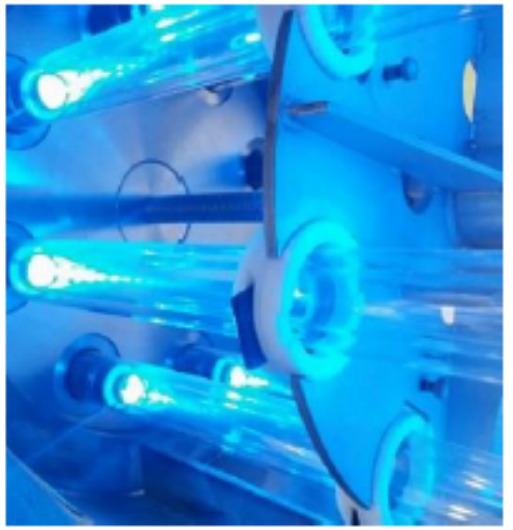
Panasia UV type



UV Lamp

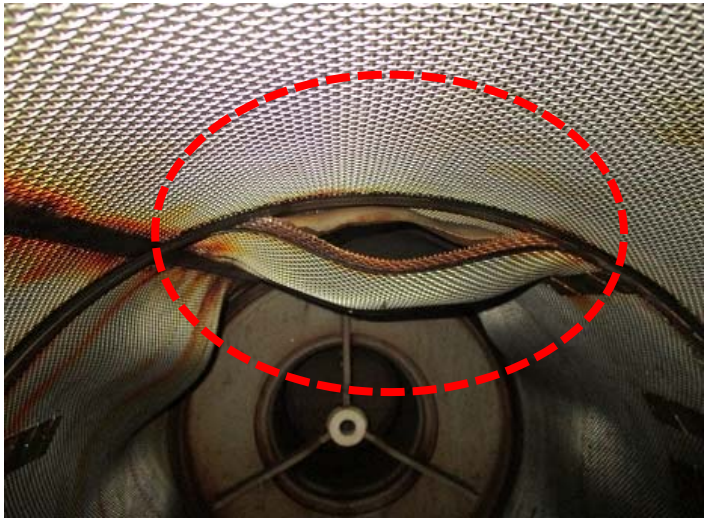


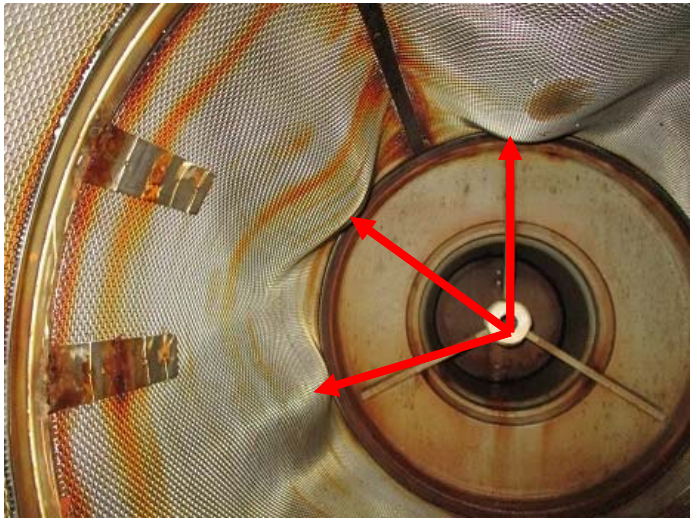
UV Sleeve with Wiper

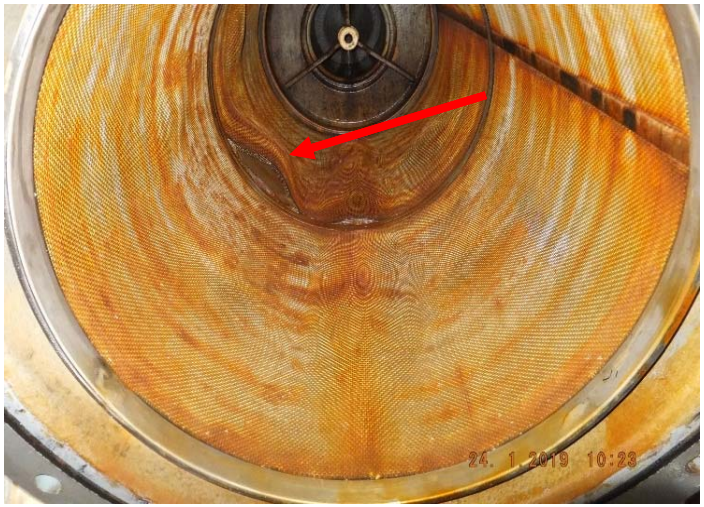


Understanding of the failure mode

Filter damaged by backpressure

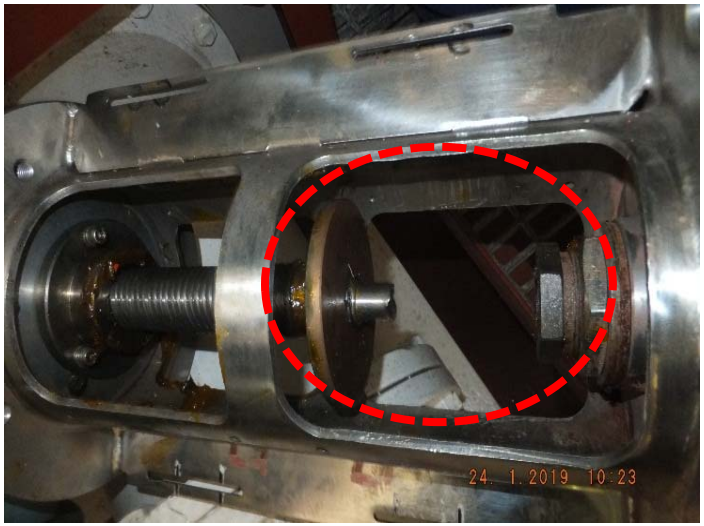


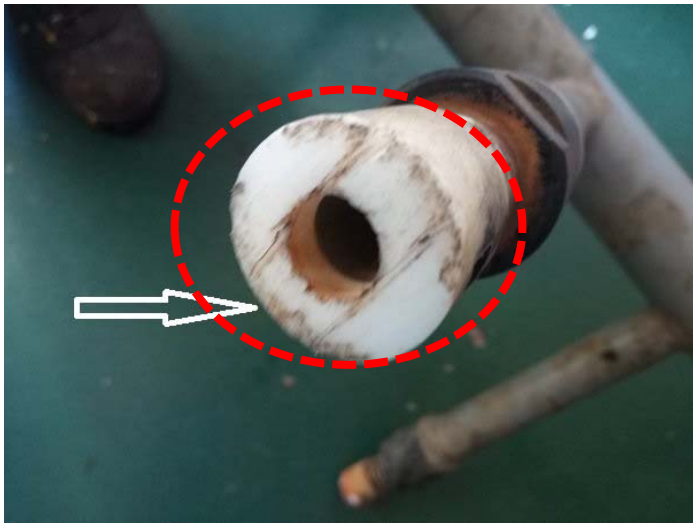




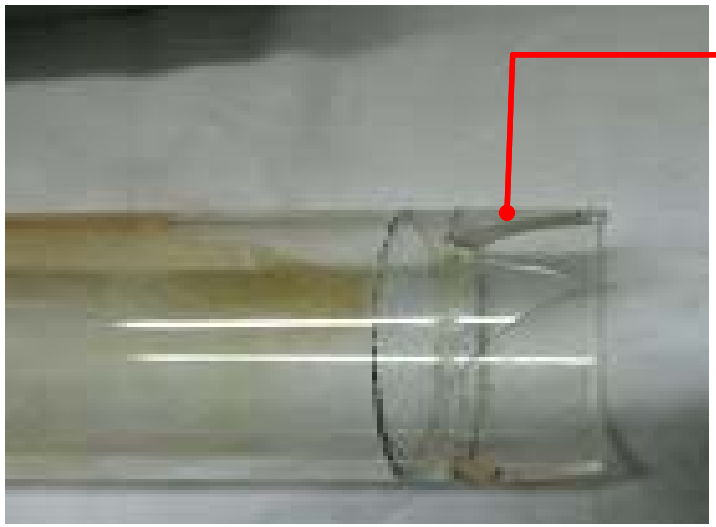
Understanding of the failure mode (cont'd)

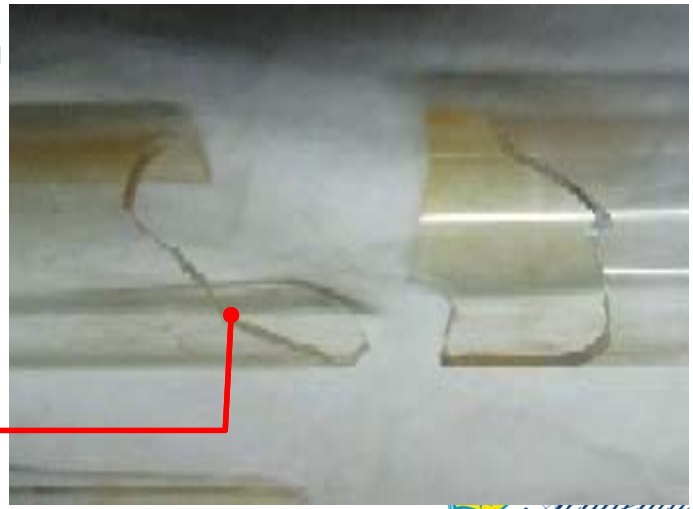
Backflushing motor shaft and scanner tip damaged by overload



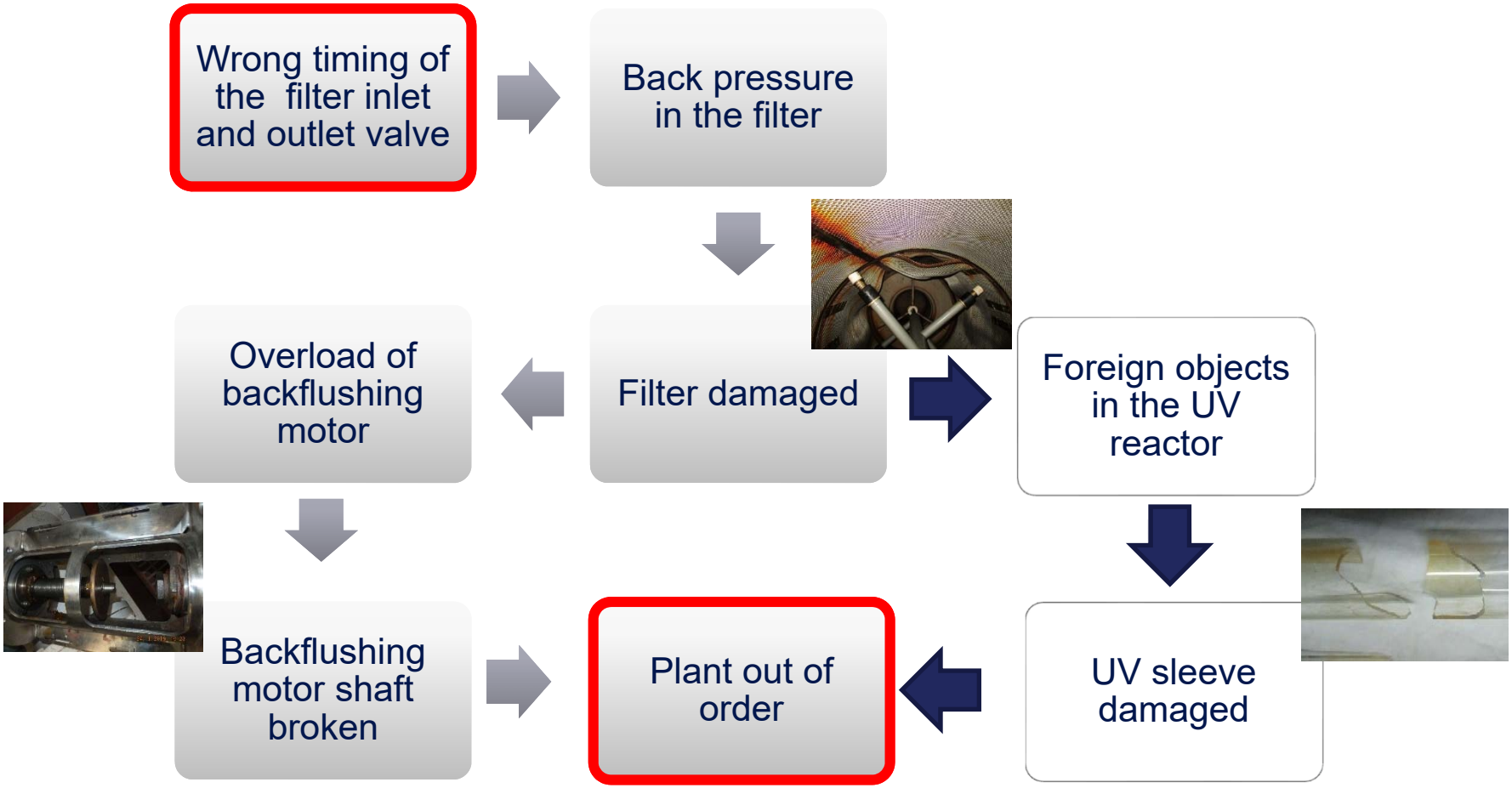


UV sleeve damaged by foreign object or wrong tightening



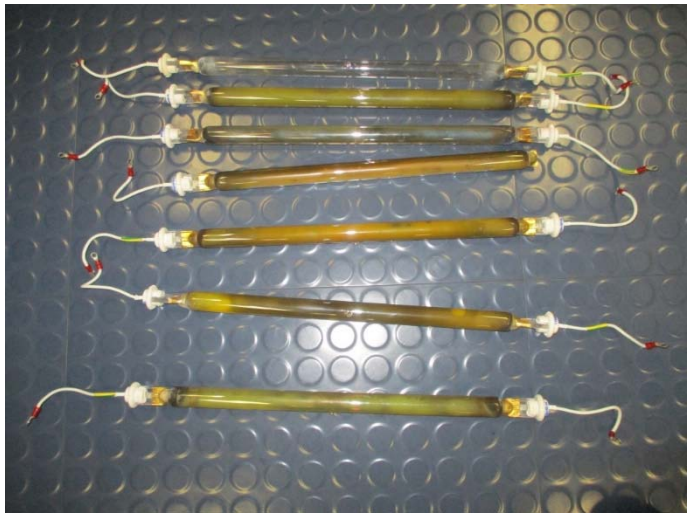


Understanding of the failure mode (Cont'd)



Understanding of the failure mode (Cont'd)

UV lamp damaged by overheating or not proper sealing (Design)



Salt from wiper motor shaft due to leak fm mechanical seal


PROACTIVE MEASURES AND BEST MANAGEMENT PARCTICES
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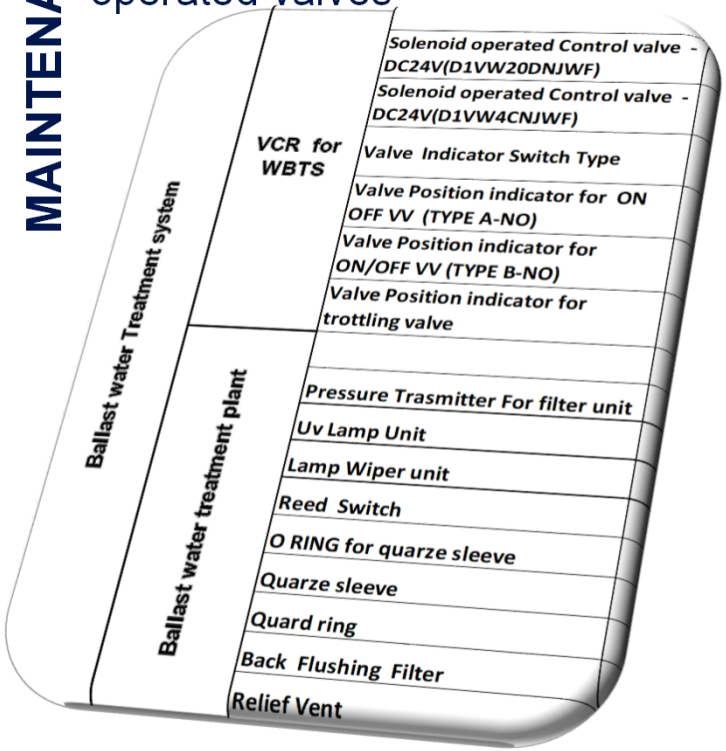
Proactive measures

MAINTENANCE PLAN

- Pressure sensors
- Temperature sensors
- UV intensity transmitter
- Cleaning of sleeves
- Periodical checking and maintenance of filter unit
- Periodical checking of remote and manually operated valves



CRITICAL SPARE PARTS

by the analysis of failure mode

Following the maker reccomendation

SAMPLING and PERFORMANCE TEST

According to the VGP requirements

Parameter	Method	Result	Unit	Limit	Pass/Fail
BALLAST WATER[1] – UV					
Biocide Monitoring – Port					
E.coli	APHA 9221 B	<1.8	MPN/100 mL	250	Pass
Enterococci	APHA 9230 C	<1	CFU/100 mL	100	Pass
Total Heterotrophic Bacteria	APHA 9215	28000	CFU/100 mL	[2]note	N/A
Biocide Monitoring – Starboard					
E.coli	APHA 9221 B	<1.8	MPN/100 mL	250	Pass
Enterococci	APHA 9230 C	<1	CFU/100 mL	100	Pass
Total Heterotrophic Bacteria	APHA 9215	180000	CFU/100 mL	[2]note	N/A
Biocide Monitoring – After Peak					
E.coli	APHA 9221 B	<1.8	MPN/100 mL	250	Pass
Enterococci	APHA 9230 C	<1	CFU/100 mL	100	Pass
Total Heterotrophic Bacteria	APHA 9215	11000	CFU/100 mL	[2]note	N/A

Best management practices

FAMILIARIZATION AND TRAINING BEFORE JOINING THE VESSEL

- Troubleshooting
- Maintenance
- System Limitations
- Reporting requirement
- Bwmp
- Commom failures

THROUGH PLANT FAMILIARIZATION WHILE ON BOARD

DEVELOP CONTINGENCY PLAN FOR THE MOST COMMOM CASE OF NON COMPLIANCE

WORLD WIDE SAMPLING FRAME AGREEMENT

INFORMATION FROM PORT OF ARRIVAL

- Sea water temperature,
- salinity,
- water quality / turbidity

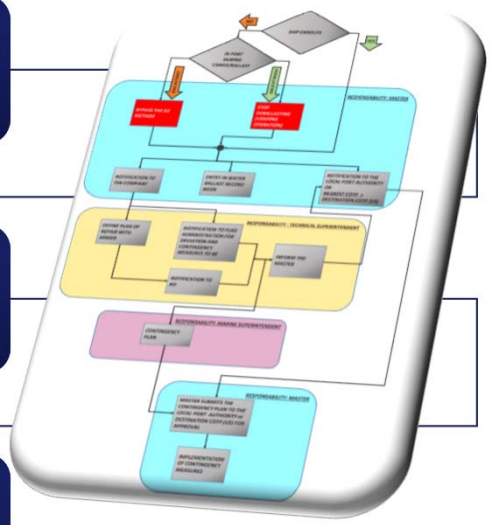
VOYAGE PLAN TO BE TAKEN IN CONSIDERATION THE SYSTEM LIMITATION

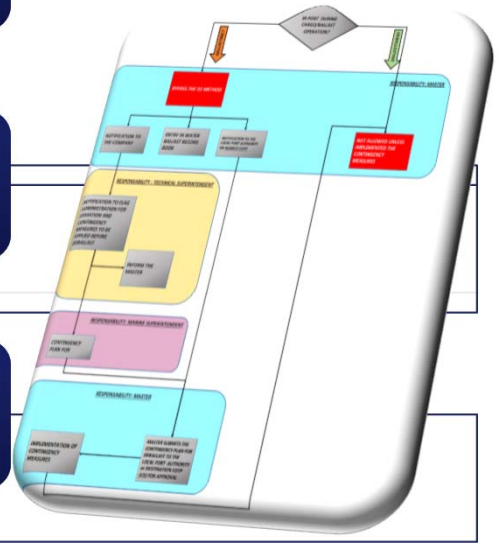
RISK ASSESSMENT BEFORE ARRIVAL IN PORT

BWMP TO BE APPROVED FOR BOTH D1 AND D2 STANDARD

The most common cases of non compliance

- NON COMPLIANT BALLAST WATER DUE TO D2 METHOD NON AVAILABLE (BOTH PLANT OUT OF ORDER)
- NON COMPLIANT BALLAST WATER DUE TO D2 METHOD PARTIALLY NOT AVAILABLE (ONE PLANT OUT OF ORDER)
- NON COMPLIANT BALLAST WATER DUE TO MUDDY WATER
- NON COMPLIANT BALLAST WATER DUE TO SYSTEM WORKING OUT OF DESIGN RANGE
- PLANT NOT APPROVED FOR FRESH WATER MODE (PSU<1)





The most common cases of non compliance (Cont'd)

Case	Vsl status	Flag	Port	Contingency Measures
Both plants out of order for technical reason	Enroute	Malta	NA	**D1 standard**
Plant not operable due to muddy water	In Port (ballasting)	Malta	Borsele (France) Immingham (UK) Port Jerome (France) SanJose (Guatemala) Amsterdam Rotterdam Paranaguà (Brazil) Liverpool (UK)	**By pass D2 method**.Once vessel will be departed and sailing, while enroute in suitable area, will proceed to carry out ballast exchange as required for comply with distance of 200 or at least 50 nautical miles from the nearest land and at least 200 meters deep . ballast water will be exchanged according Ballast Water Management Plan (D1 method), it will be discharged without passing to the treatment system and loaded using BWTS (back to D2 method). Same will be recorded into recorded into the BWRB. If there will be voyage restriction and aforementioned condition will be not match, the vessel will not exchange ballast in accordance to the BWM.2-Circ.63. provided that Capt.will enquire to local authorities if any restriction will be applied to ballast discharge. Also for such case, proper entry into the ballast record book will be recorded.

The most common cases of non compliance (Cont'd)

Case	Vsl status	Flag	Port	Contingency Measures
Both Plant Not Operative due to technical reason	In Port (Deballasting)	Malta	Olexun (Sweden)	**By pass D2 method after approval by local Port authority.**
Plant not operable due to muddy water	In Port (Deballasting)	Liberia	Borsele (France)	**By pass D2 method After approval by local Port authority.**
Plant not operable due to muddy water	In Port (Deballasting)	Malta	St. Petersbourg (Russia)	**By pass D2 method After approval by local Port authority.**
Plant not approved for fresh water	In Port for back loading	Liberia	Missisipi river	**Vsl stopped the operations and directed by COPT to go out 12 nautical miles for BWE taking ballast by BWMS before proceed with backloading operation. The operation must be approved also by flag-**
Both Plant Not Operative due to technical reason	In Port (deballasting)	Liberia	Houston	**Vsl stopped the operations and directed by COPT to go out 12 nautical miles for BWE. The operation must be approved also by flag-**

The most common cases of non compliance (Cont'd)

Case	Vsl status	Flag	Port	Contingency Measures
Drydock	Departure from drydock: Ballast water supplied by Yard (5000/6000 m3 for MR)	Malta	Turkey	**By pass D2 method**.Once vessel will be departed and sailing, while enroute in suitable area, will proceed to carry out ballast exchange as required for comply with distance of 200 or at least 50 nautical miles from the nearest land and at least 200 meters deep . ballast water will be exchanged according Ballast Water Management Plan (D1 method), it will be discharged without passing to the treatment system and loaded using BWTS (back to D2 method). Same will be recorded into recorded into the BWRB. If there will be voyage restriction and aforementioned condition will be not match, the vessel will not exchange ballast in accordance to the BWM.2-Circ.63. provided that Capt.will enquire to local authorities if any restriction will be applied to ballast discharge. Also for such case, proper entry into the ballast record book will be recorded.
Drydock	Docking (last parcel to be discharged by gravity)	Malta	Turkey	To be done the BWE in the dedicated area of med before entering in drydock.

The most common cases of non compliance (Cont'd)

Good day Mr. xxxx,
Ref. subject, MT Cielo xxxxx is in Port of St. Petersbourg (Baltic Russia) and she has reported difficulties to discharge ballast using BWTS due to muddy water in port. Master have notified it to local port Authority and asked permission to discharge ballast under D1 method. Authorities replied affirmatively on our request (attached response for prompt reference). Said above we kindly ask this Administration to grant permission to discharge ballast under D1 method. All relevant entries shall be made in BWT Loog book.

Good afternoon Mr. xxxx

Reference to your below email notification of today 14 March, please note that having reviewed this matter we do hereby confirm that such a proposed course of action/contingency measure adopted is in line with the spirit and requirements of the International Ballast Water Management Convention.

In light of the above, this office has no objections to the below ballast water management proposal.

Records/entries shall be made in the BW record book under operational Code 3.6 (mentioning reasons for non use of BWTS).
Mindful that certain parameters such as Total Suspended Solids (TDS), Dissolved Organic Matter (DOM), especially the Particulate Organic Carbon (POC) and other related parameters that contribute to high the water turbidity may adversely affect the system.

The operation of the ballast water treatment plant has to be carried out in accordance with the instructions of the BWM plan and most importantly in line with the limitation and conditions specified in the BWTS documentation such as the Type Approval (TA) Certification and the approved Operations and Technical Manual.

Overlapping between conventions

Thank you!