



TECHNICAL CIRCULAR No. 311 of 9th December 2015

To:	All Surveyors/Auditors
Applicable to flag:	All Flags
Subject:	<b>BWM- Final Approval Granted-ECS-HYBRID System &amp; VARUNA BWT System</b>
Reference:	<b>BWM Convention</b>

Circ. Dec. 6

## **BWM – Final Approval Granted-ECS-HYBRID System & VARUNA BWT System**

### **ECS-HYBRIDTM System**

Submitted by Republic of Korea (MEPC 68/2/3 – Fig 5), this system employs a backwash filter unit mounted directly in the main ballast pipeline to eliminate the organisms and suspended matter larger than 40 µm. Auto-back-flushing occurs when the difference between inlet and outlet pressure of the filter exceeds 0.5 bar.

#### **Customer Service Center**

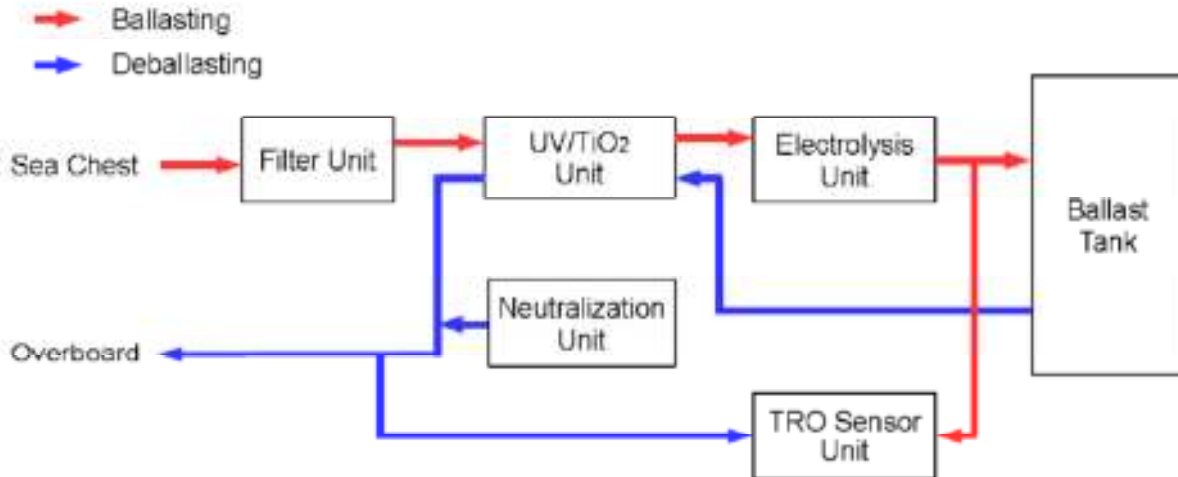
5201 Blue Lagoon Drive, 9<sup>TH</sup>. Floor,  
Miami, Fl., 33126  
Tel: 1 (305) 716 4116,  
Fax: 1 (305) 716 4117,  
E-Mail:

[joel@conarinagroup.com](mailto:joel@conarinagroup.com)

#### **Technical Head Office**

7111 Dekadine Ct.  
Spring, Tx., 77379  
Tel: 1 (832) 451 0185,  
1 (713) 204 6380

E-Mail: [cbozenovici@vcmaritime.com](mailto:cbozenovici@vcmaritime.com)



**Fig 5 – ECS-HYBRID Schematic**

After filtration by the filter unit, the remaining organisms are disinfected by UV radiation, which is automatically adjusted to maintain constant intensity. After UV, the electrolysis unit disinfects the remaining organisms by generating hypochlorous acid and hypobromous acid with a maximum concentration of TRO of 15 mg/L TRO as Cl<sub>2</sub>. Before discharging overboard, the treated water is passed through the UV unit again and then neutralized by using sodium thiosulfate. The maximum allowable discharge concentration is 0.2mg/L TRO as Cl<sub>2</sub>.

**VARUNA BWT System**

Submitted by Singapore (MEPC 68/2/6 – Fig 6), which combines filtration (a 40µm self-cleaning backwash), electrochemical treatment and neutralization processes that are monitored by a control unit to optimize the treatment of ballast water. Primary and secondary treatment is performed during ballast intake and tertiary treatment is carried out during deballasting.

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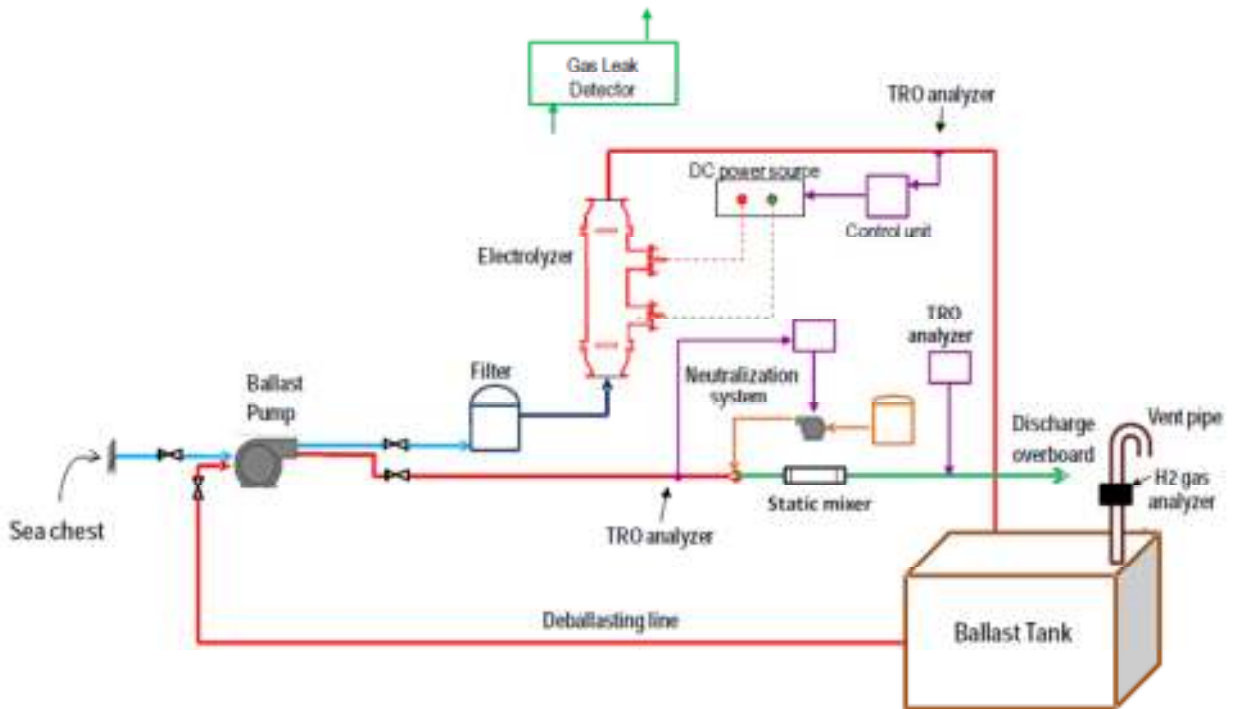
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1 (713) 204 6380

E-Mail: [cbozenovici@vcmaritime.com](mailto:cbozenovici@vcmaritime.com)



**Fig 6 – VARUNA BWT System**

**REFERENCES:**

- BWM Convention

**ATTACHMENTS: No.**

Kindest Regards,  
 Cosmin Bozenovici  
 Naval Architect – Conarina Technical Head Office

**Customer Service Center**

5201 Blue Lagoon Drive, 9<sup>TH</sup>. Floor,  
 Miami, Fl., 33126  
 Tel: 1 (305) 716 4116,  
 Fax: 1 (305) 716 4117,  
 E-Mail:

[joel@conarinagroup.com](mailto:joel@conarinagroup.com)

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 Tel: 1 (832) 451 0185,  
 1 (713) 204 6380

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