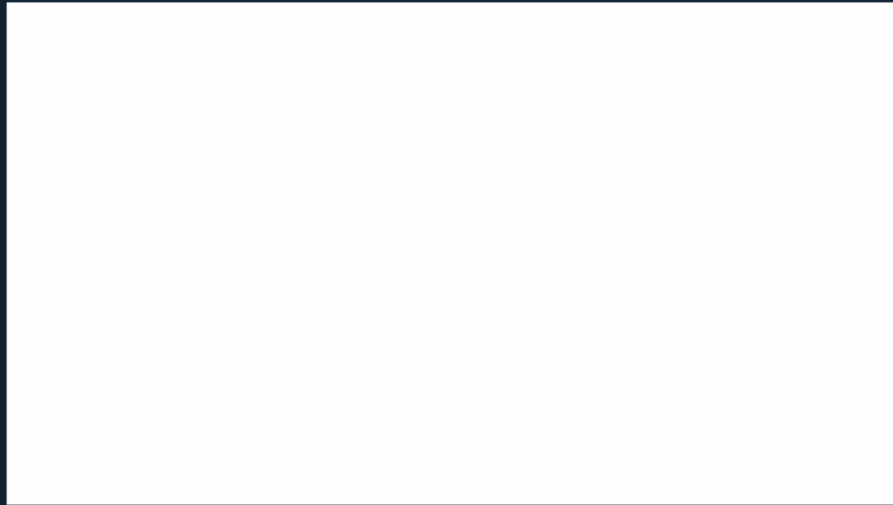




Good afternoon; My name is Karli Boschitsch, Ballast Water consultant at Venteville. I will tell you something about the operational phase of Ballast Water Treatment. This presentation will go a little bit broader than global maintenance as mentioned in the program.

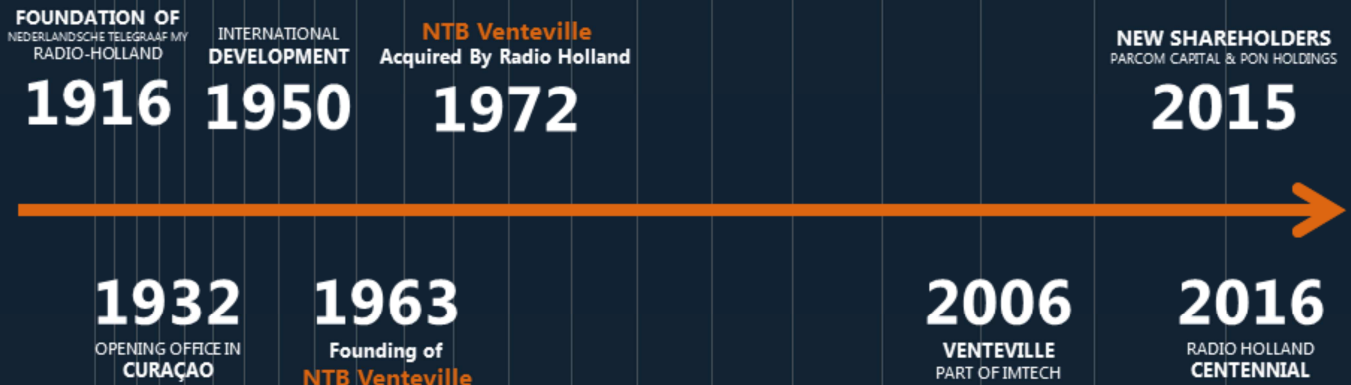
Venteville & Ballast Water Treatment



Introducing Venteville:

The Venteville Ballast Water Treatment teaser explains about the Ballast Water Treatment Products & Services

Short history



For those of you who don't know; we are part of Radio Holland, the Navcom company. Track record shows almost 55 years of Venteville; in combination with over 100 years of Radio Holland. We are part of Radio Holland since 1972. This clearly shows there is no "HIT AND RUN" mentality here. We are here to stay, and long term commitment is in our DNA.

Introduction to Venteville

Trade & Service Maritime Market

Portfolio : Secondary technical installations in and around the engine room related to water treatment and LED applications

- Marine Growth Prevention Systems (MGPS)
- Integrated Ballast Water Treatment solutions
- Impressed Current Cathodic Protection (ICCP)
- LED Navigation lighting
- Helideck automation



Not much to add to the video I suppose. We are founded and still based in Rotterdam. Venteville provides sales and service of secondary installations in and around the engine room.

Relevant example is the Legendary Chloropack MGPS by Electrocatalic (Evoqua); which is in our portfolio since the 1970's.

Ballast Water Treatment Venteville proposition

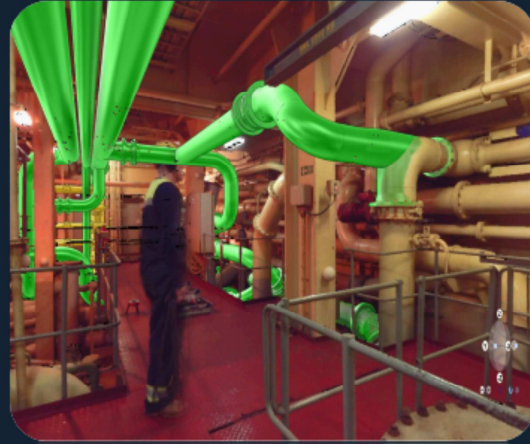
- UV & Electrochlorination
- 30-5.000 m³/h capacity
- NB & Retrofit Concept
 - Feasibility Study
 - Turn-key offer
- Operational Concept



Our BWT proposition is based on two treatment technologies. We work with Evoqua for Electrochlorination and our other partner is BioSea with an UV based treatment system. The standard treatment range is 30-5.000m³/h. This is suitable for NB & Retrofit. In our retrofit concept the feasibility study is the basis for a turn key offer. The main topic for this presentation is the operational concept.

Ballast Water Treatment Venteville proposition

- UV & Electrochlorination
- Retrofit Concept
 - Feasibility Study
 - ✓ 3D Laser scan
 - ✓ Study case C+E+ AMS integration & alternatives
 - ✓ Cloud Engineering
 - Turn-key offer
- Operational Concept



Our feasibility study includes constructional and electrical integration. In addition, Alarm & Monitoring System integration can be included. We will also report any feasible installation alternatives.

Our cloud engineering process allows for a reduction of engineering hours which results in a cost effective process.

Ballast Water Treatment Venteville proposition

- **UV & Electrochlorination**
- **Retrofit Concept**
 - **Feasibility Study**
 - **Turn-key offer**
 - ✓ **BWT plant**
 - ✓ **Piping and fittings**
 - ✓ **E / AMS integration**
 - ✓ **Class Counseling**
 - ✓ **Installation**
 - ✓ **Commissioning/training**
- **Operational Concept**



Our offer can be tailored to the required elements; up to the point a turn-key package arises. In this case we will also include Certified project management (PRINCE 2 / IPMA), and a Single Pointy of contact within Venteville.

Ballast Water Treatment Operational concept

Compliant system \neq discharge compliance



I now want to get to the core of our presentation: The operational phase.

Having an approved system on-board does not automatically lead to discharge compliance.

What are your thoughts? Anyone any comments?

** - Untrained operation may lead to non-compliant water discharge

** - Bad maintenance may also lead to unexpected failure of the system, with the risk of non-compliance

Ballast Water Treatment Operational concept

Non-compliant
performance or operation
of BWT Equipment
will interfere with schedule
and cost money



I wonder if everybody is aware of this one-liner.

Think about Unscheduled longer port stay; (last minute port treatment solutions) fines, port bans...

Ballast Water Treatment Operational concept



1. Training
2. Monitoring
3. Service
4. Global availability SpareParts



For Ballast Water Treatment; four elements will be crucial to optimally manage the compliance risks.

IN OUR VISION:

Training; monitoring; service and availability of spare parts will play an important role.

Ballast Water Treatment Training

Target group:

- Service Engineers
- Crew
- 3rd party installation personnel

How:

- Computer Based Training
- Practical Training

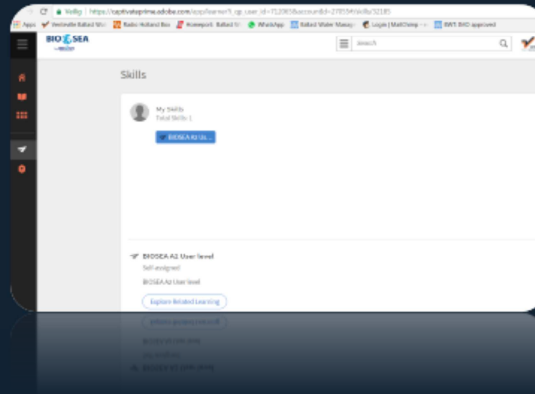


For training we target service engineers, crew and 3rd party installation personell

Ballast Water Treatment Training

Computer Based Training:

- **Online at own time and pace**
- **Always up-to-date**
- **Different levels:**
 - **System User**
 - **Service**
 - **Installation**
 - **Commissioning**
- **Online management views**



The first training step is a Computer Based Training.

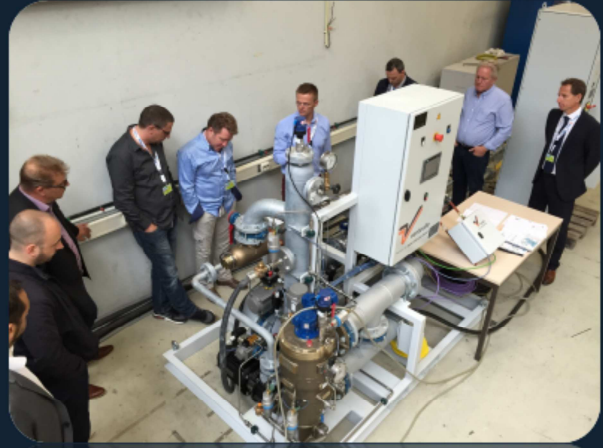
The biggest benefit is training without travelling, and the content is always up-to-date.

In our CBT training environment we offer various knowledge levels, and in the management view the status of each trainee can be monitored.

Ballast Water Treatment Training

Practical Training:

- Available after completion CBT
 - Onboard
 - Training Center Rotterdam



After passing the CBT test the practical training can be scheduled.
This can be done on-board; or at the Venteville Training Center in Rotterdam

Ballast Water Treatment Training

1. Service Engineers

Creating a global service network.

Service centers:

- Houston
 - Hamburg
 - Rotterdam
 - Cape Town
 - Dubai
 - Singapore
 - Hong Kong
- Other 80 Radio Holland locations will follow market developments



Venteville is building a global service network. A prominent role is reserved for six Radio Holland offices. This enables quick access to service & parts on all mayor trading routes. Following the implementation of more systems, the Radio Holland offices will follow the market with respect to training and stock strategy.

Ballast Water Treatment Training

2. Crew

- **Initial training during commissioning**
 - Little operational knowledge yet
 - Coverage entire crew
- **Follow-up training**
 - Secure compliance during life cycle



We see that crew training is usually offered in combination with commissioning. Although this seems effective, there are a number of considerations:
There is little operational knowledge yet
This training will not include the entire crew
Our recommendation is to invest in a recurring training schedule during the vessel lifecycle.

Ballast Water Treatment Training

3. 3rd party installation personnel

- **Shipyard, piping company**
 - **Limited experience**
 - **Short retrofit timing**
- **Who:**
 - **Project Managers**
 - **Installation Supervisors**



We receive inquiries for 3rd party training as well. This can be a shipyard, but also a piping company, that wants to have better knowledge of the treatment technology. Note that there is typically little experience and little time for installation. (Turn-key: Yard no engineering, thus little knowledge)

Ballast Water Treatment Operational concept



1. Training
2. Monitoring
3. Service
4. Parts



I now want to talk about monitoring.

Knowing the status of the system will help you to perform preventative maintenance, and it may also help with trouble shooting.

In a situation in which the general knowledge level on-board decreases, we are introducing a totally new technology on-board. It might be a good idea to remotely look over the shoulder of the crew. And assist, where needed.

Ballast Water Treatment Remote Monitoring

The Global Technical Assistance Center (GTAC) of Radio Holland facilitates remote vessel monitoring.



24/7 coverage :

- Rotterdam
- Houston
- Singapore



For exactly this purpose Radio Holland has a dedicated department. The

Ballast Water Treatment Remote Monitoring

Access management

- Owner always in the lead!
- Ownership of data
- Cyber security

Data volume management

- Size of data packets, and communication planning

Content management

- who will monitor, and which action scenarios

Remote data logging

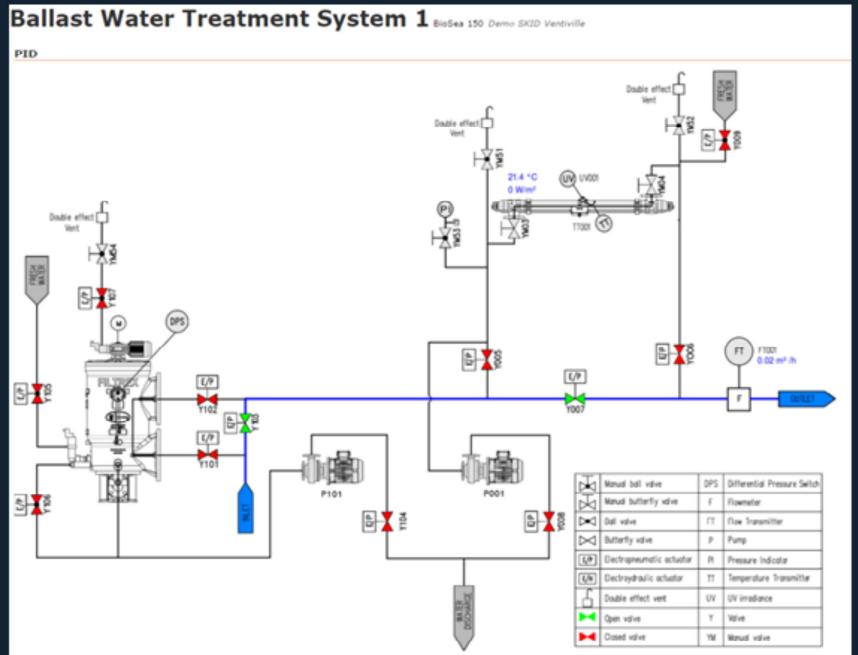
- Data back-up



For Ballast Water Treatment we can offer a tailor made remote monitoring package. Simply pick the required blocks to achieve the desired support level. In case of any worries concerning data security, please contact us for a cyber security health check.

Ballast Water Treatment

Remote Monitoring



We have mimicked the user interface as shown on-board to ease communication with Crew. In this image you see a the PID with the position of the valves, and indication of flow, UV intensity and temperature.

Ballast Water Treatment Remote Monitoring

Temperature transmitter -

TT001 -

Temperature

Temperature21.999996185 °C

History: ⓘ

UV Sensor -

UV001 -

UV Irradiance

UV Irradiance0.0188078712672 W/m²

History: ⓘ

UV Lamp and controllers -

UV1.1 -

ELC status

Default statusOff ⓘ

Statusundefined ⓘ

ELC Alarm

AlarmNo alarm ⓘ

ELC consumption data

Current Amperage0.0 A

Current Voltage0 V

Current Power0 W

General -

General -

Status

2nd-ary PLC PresenceNo

Mode statusAutomatic

Operation0

Measurements

Consumption1054417074 kw/h

Volume measurement0 m³

History: ⓘ

General alarms and warnings -

General alarms and warnings

Emergency stopNo alarm

FilterNo alarm

FlowNo alarm

General stateNo alarm

HMINo alarm

Secondary PLCNo alarm

UV irradianceNo alarm

WashingWarning - Made a washing of installation

Y ship bypassNo alarm

Y ship TransferNo alarm

History: ⓘ

We can drill into more detail if required.

Ballast Water Treatment Operational concept



1. Training
2. Monitoring
3. Service
4. Parts



Another big consideration is Service.

Ballast Water Treatment Service

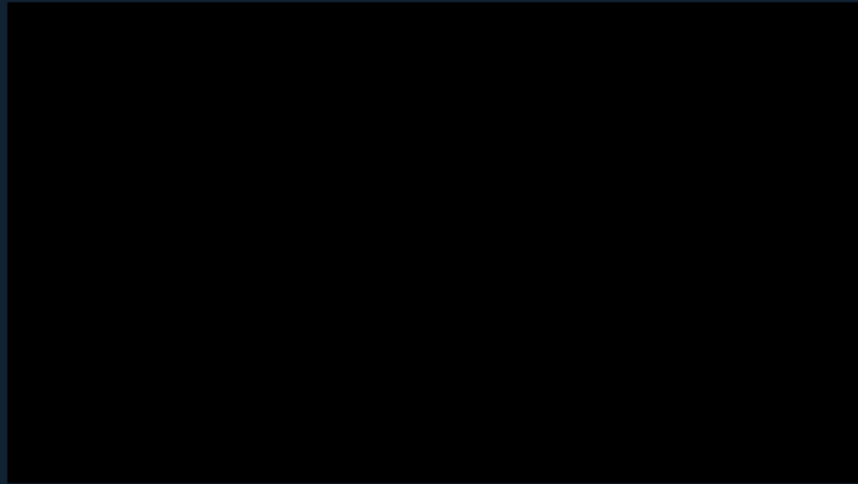


1. BWT needs annuals like GMDSS or Gyro
2. Collaboration with Radio Holland
 - Global presence
 - Fast Contract experience



With the preventative mandatory agreement Radio Holland takes care of all mandatory surveys. We may include any obligatory elements for Ballast Water Treatment in here as well. For some systems it is mandatory to periodically calibrate sensors, this can easily be included; and provides carefree compliance!

Ballast Water Treatment Service video RH



Ballast Water Treatment Conclusion

Find your partner:

- UV & Electrochlorination
- 30-5.000 m³/h capacity
- NB & Retrofit Concept
- Operational Concept
 - ✓ Training
 - ✓ Remote monitoring
 - ✓ Service
 - ✓ Parts



I want to finalise summing up our recommendations.

The obvious is that you will need to find and implement a suitable treatment system.

But find yourself a partner that can provide training, monitoring, service and parts. And take your trading patterns into consideration here.

Contact
Venteville:

Contact
Radio Holland
Germany:



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QUESTIONS



Any questions?