The Software Package

Marine Training Software
Part 9

UNITEST Marine Training Software Part 9 are software packages consisting of several independent educational modules.

The following modules are included:

1. Alfa Laval PureBallast 3
2. Alfa Laval PureBilge - Bilgewater Cleaning System
3. Fixed Firefighting Systems
Alfa Laval PureBallast 3

A ballast water treatment system based on Alfa Laval PureBallast 3. The new module contains a presentation part and a simulator.

A ballast water treatment system is required by the new Convention for the Control and Management of Ships’ Ballast Water and Sediments, commonly referred to as the BWM. The convention requires ballast water to be treated to specific standards prior to discharge, and permits national, regional and local authorities to apply their own regulatory framework in their respective territorial waters.

The presentation part covers basic information related to ballast water management rules, configuration of the system and describes working principles.
Alfa Laval PureBallast 3 simulator supplements the theoretical information from the presentation parts and enables practical training on the system. The following processes are implemented in the simulator:

- ballast
- deballast
- striping
- cleaning on place CIP

the simulator has got the original Alfa Laval PureBallast 3 HMI and is equipped with very realistic 3D graphics.
PureBilge - Bilgewater Cleaning System

Bilge water must be treated to reduce the oil content to levels that meet international regulations for release into the environment. This is critical to keep the world’s oceans and vast marine and land ecosystems healthy and productive.

The Unitest PureBilge system simulator based on an Alfa Laval solution is a reliable and fully automated, single-stage centrifugal separation system to clean oily water onboard vessels at sea and at land-based power plants. PureBilge is approved by Class societies and the U.S. Coast Guard based on International Maritime Organization (IMO) test protocol.

PureBilge is able to reduce the oil-in-water content of bilge water to less than 15/5ppm. Depending on size, it operates at flow rates of up to 2500 or 5000 litres per hour to handle even the toughest bilge water treatment applications.
1. SYSTEM DESCRIPTION
1.1 INTRODUCTION

Mechanisms for emulsion breakdown

There are different mechanisms for emulsion destabilization and breakdown, including coalescence and flocculation.

- Coalescence is a process where two or more droplets collide, resulting in the formation of one larger droplet.
  - A high centrifugal force induced in a centrifugal separator greatly contributes to the coalescence of small droplets.
  - Elevated temperature accelerates the rate of coalescence by increasing the probability of the droplets to collide and by decreasing the viscosity of the continuous phase.
  - Chemical demulsifiers decrease or cancel the repulsive electrostatic forces between droplets in an emulsion, causing droplet coalescence.

- Flocculation is a process by which two or more particles aggregate without losing their individual identities.
  - A high centrifugal force induced in a centrifugal separator greatly contributes to the flocculation of small particles.
  - A high alkaline pH value promotes flocculation. The pH value provides a measure on a scale from 0 to 14 of the acidity or alkalinity of a solution.
  - Chemical flocculants decrease or cancel the repulsive electrostatic forces between particles in a suspension, thus promoting flocculation.
Fixed Firefighting Systems

Marine Convention SOLAS and Classification Societies require all seagoing ships to be equipped with a firefighting system. Different types of firefighting systems, also named extinguishing systems or appliances, are used on board ships.

Unitest Fixed Firefighting Systems CBT module describes basic rules related to marine firefighting systems and also presents a series of movies related to their operational procedures.

The module concerns the following issues:

- Crew responsibilities in case of fire
- Fire detection and alarm system
- Hydrant firefighting system
- Water mist firefighting system
- CO2 firefighting
- High expansion foam firefighting system
Fire detection and alarm system

Fire detection system serves for detection, location and alarming about the fire on board the ship; an example of the system is shown at this diagram.

The system consists of Master Monitoring Panel equipped with computerized control, Slave Panels, smoke, heat and flame detectors and manual call points.

Water mist system diagram

by isolating valves on proper branch line; isolating valves can be remotely operated from Fire Control Station or locally by push button nearby protected compartment; manual operation is possible by remote controlled valve by-passing.

1 – fresh water tanks
2 – high pressure pump
3 – isolating valves