



## MARINE SOLUTIONS

CONSULTATION DESIGN INSTALLATION and SERVICE

### BALLAST TANK MONITORING & CONTROL SYSTEMS

#### Introduction

The Marine industry, long ago recognized that efficient and safe ballasting would provide significant advantages to operators and owners of vessels.



before

The photo above shows a typical 20 to 30 year old ballast system. These systems normally employed Mercury filled manometer display gauges with air flow "purge" flow-meters to provide individual tank level measurements.

*Servicing* and *maintaining* these legacy ballast systems can be *very difficult*.

#### Special Points of Interest...

- Ballast Tank information can be integrated into ship's information system
- Additional display panels can be provided as needed
- Staged Implementation: monitor to start... full automation of ballasting system later
- Original parts are no longer available and the use of mercury gauges has been restricted
- FRS provides complete solution:  
**consult, design, installation and service**

#### Solution

Working with our Marine customers FRS developed a migration path for upgrading older ballast systems to current technologies:

- Upgrade bubbler air purge systems for precision measurement.
- Remove mercury manometers and replace with SMART electronic level transmitters
- Provide a PLC based monitoring and alarm system
- Operator interface is a colour TFT touch screen display
- Full system overview with adjustable tank alarm settings



after