



# **Cavotec Alternative Maritime Power supply**

**AMP Conference – San Pedro April 24-25, 2006**

**By Ottonel Popesco, President and COO of Cavotec Group**



## Alternative Maritime Power

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# **Cavotec**

## **AMP Systems**

**Solutions for a clean  
environment**

## Alternative Maritime Power

### Shore-to-Ship power

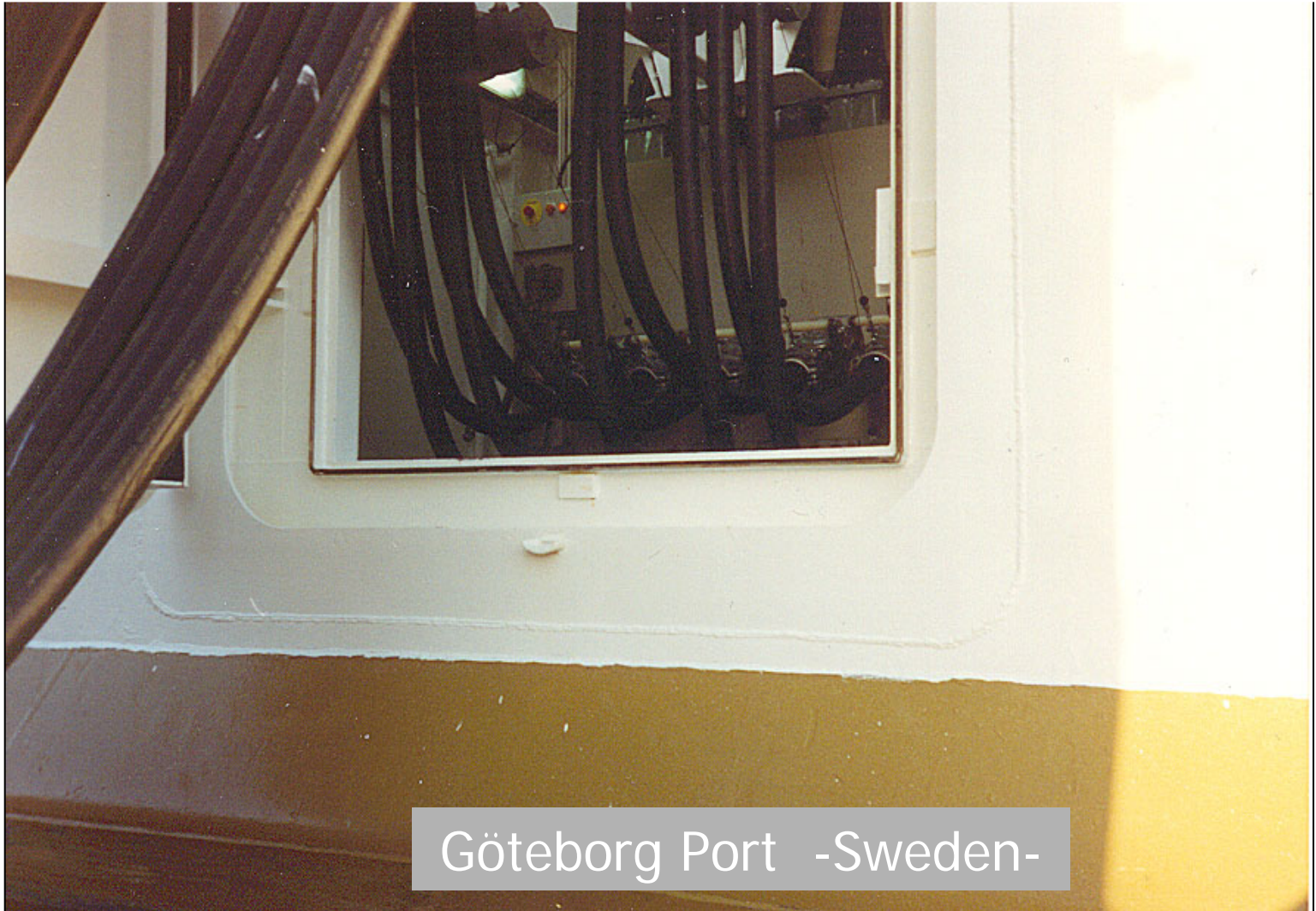
**Shore-to-Ship power is not a new technology, but has application on different type of ships since many years**

**The Cavotec Group now has more than 18 years of experience in this matter and is involved in sales and the development for shore-to-ship electrical power supply.**



## Alternative Maritime Power

Shore-to-Ship power for Ferries since 1988



Göteborg Port -Sweden-



## Alternative Maritime Power

Shore-to-Ship power for icebreakers since 1992





## Alternative Maritime Power

Shore-to-Ship power for US Cost Guard since 2001

Sockets





## Alternative Maritime Power

- **3 different maritime applications**
- **One common request:**
  - **a quick and easy connection**



## Alternative Maritime Power

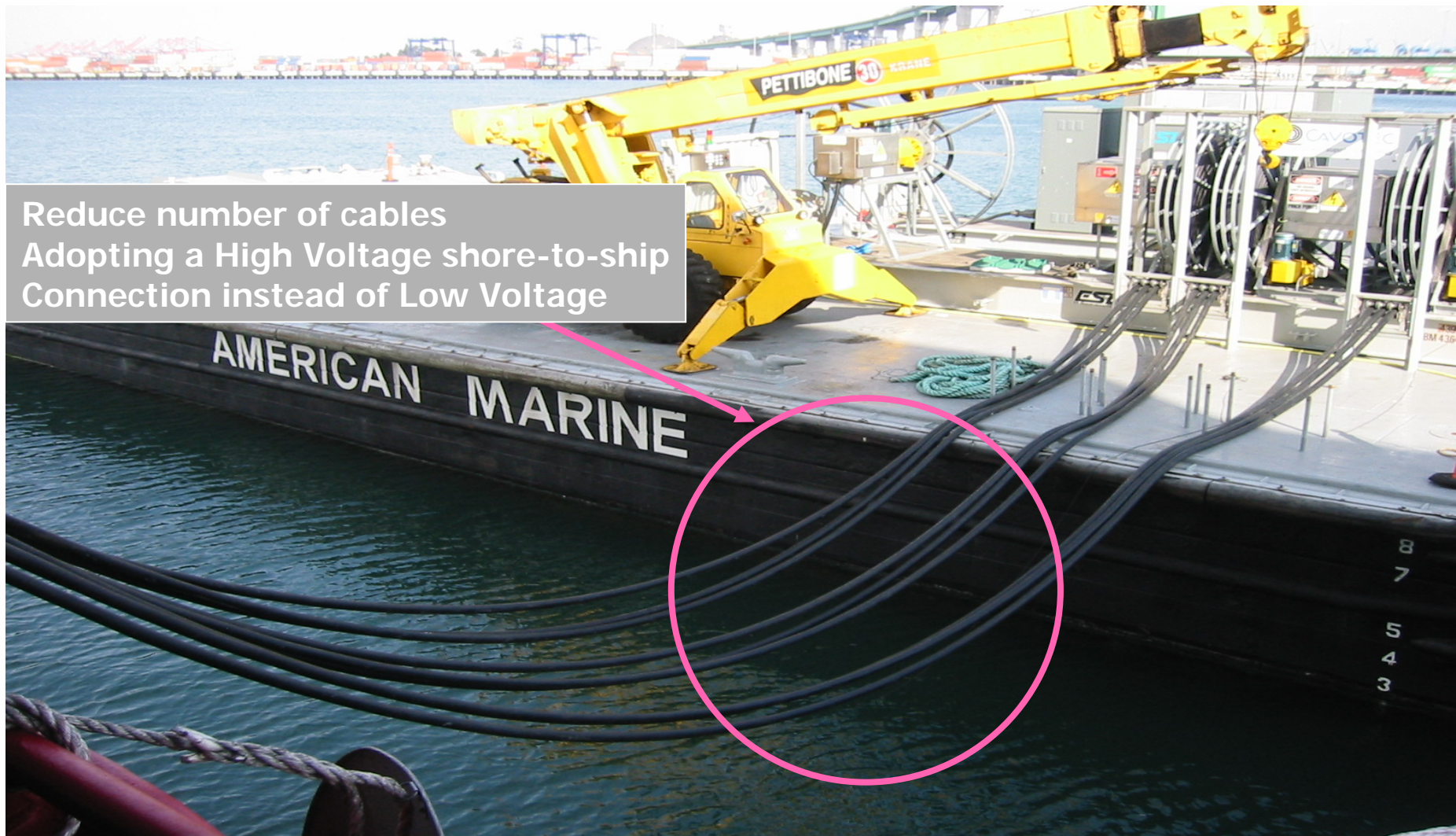
**What did we learn from our maritime experiences for the container industry ?**



## Alternative Maritime Power

### Experience from Pier 100 Project

Reduce number of cables  
Adopting a High Voltage shore-to-ship  
Connection instead of Low Voltage

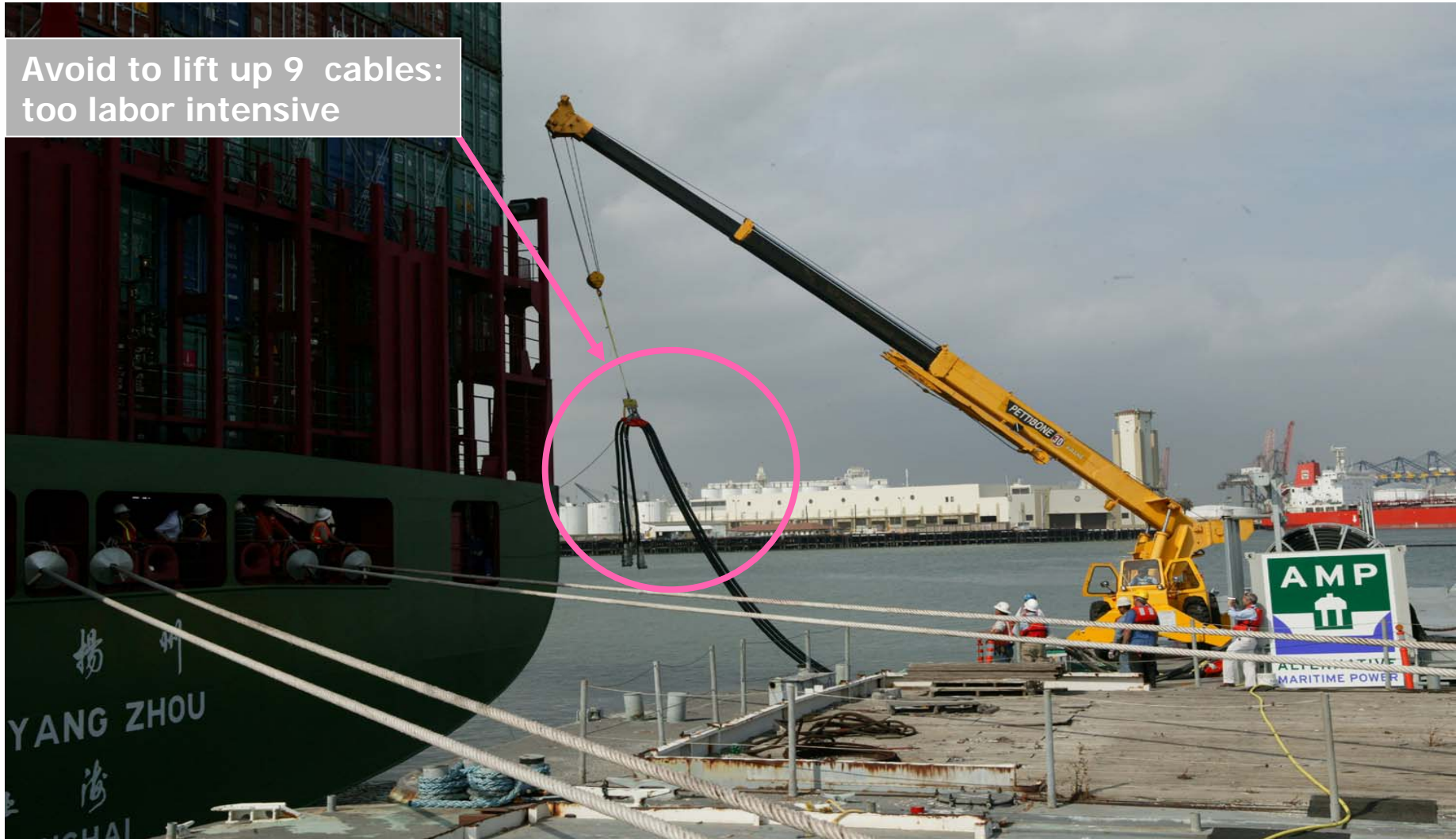




## Alternative Maritime Power

### Experience from Pier 100 Project

Avoid to lift up 9 cables:  
too labor intensive





## Alternative Maritime Power

### Experience from Pier 100 Project

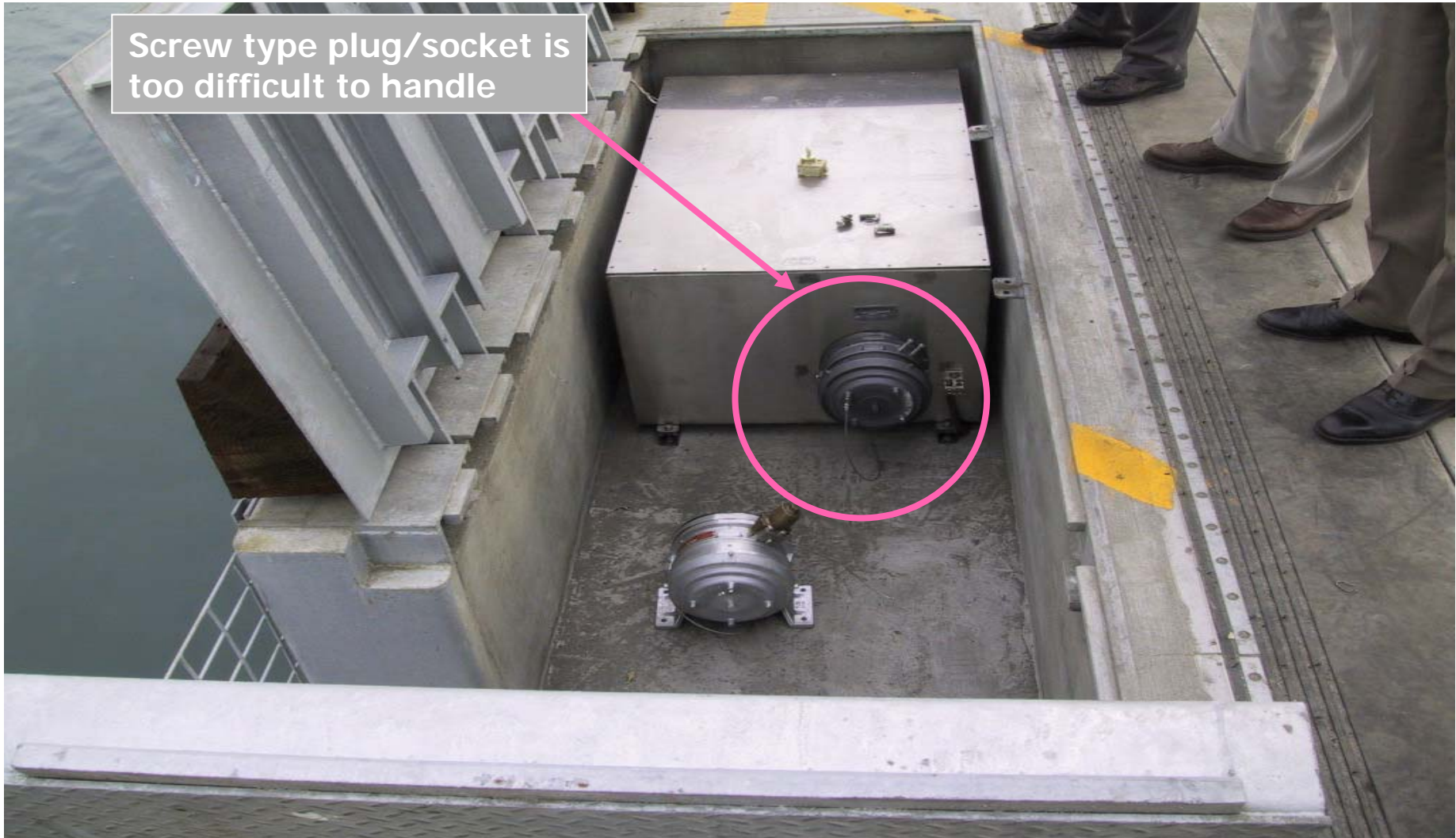
Reduce size of the plugs.  
They must be easy to handle





## Alternative Maritime Power

### Shore connection facilities in POLA



Screw type plug/socket is too difficult to handle

## Alternative Maritime Power

### Solution

- **Safety**
- **Standardization**
- **Simplification**

**A must**



## Alternative Maritime Power

### Solution

- ❖ **Shore-to-ship power 6,6 kV up to 8 MVA**

### Ship

- ❖ **Cable Management System placed on board of the ship. One or two cables depending from the Ship size**

### Shore

- ❖ **Shore Junction Boxes with 2 receptacles up to 350A each**
- ❖ **Push-pull system for plug/socket connection**
- ❖ **Optical fibers communication integrated in the power Plug/socket**



## Alternative Maritime Power

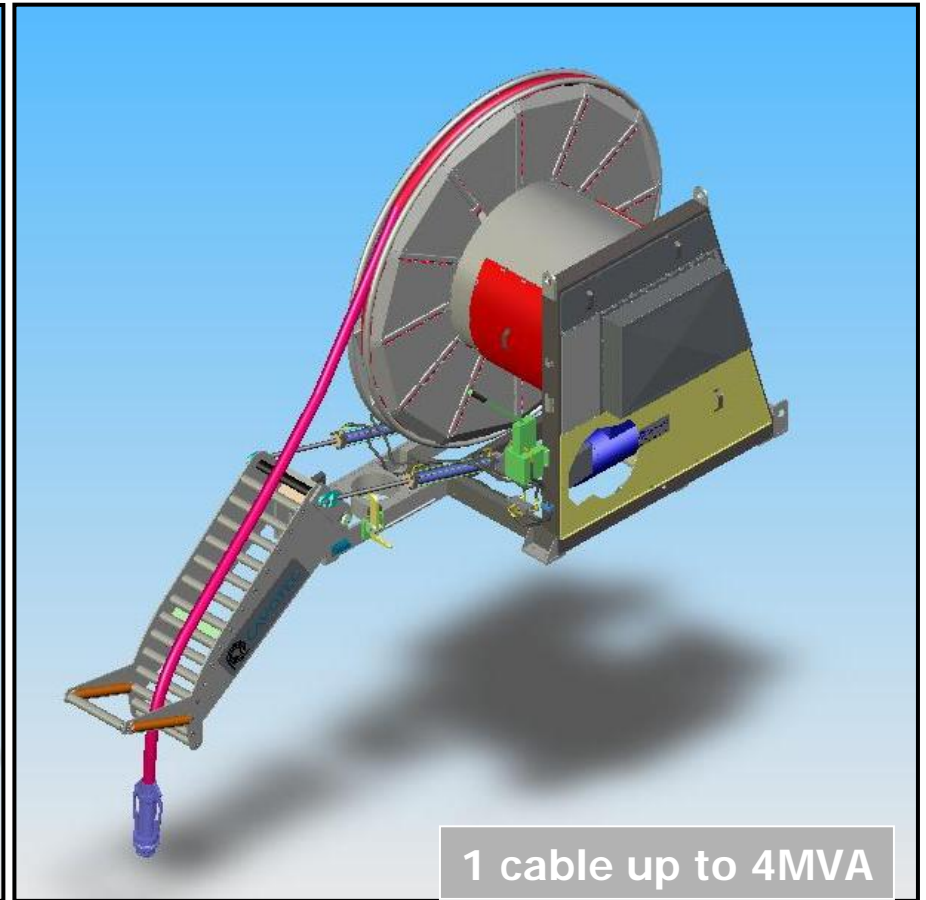
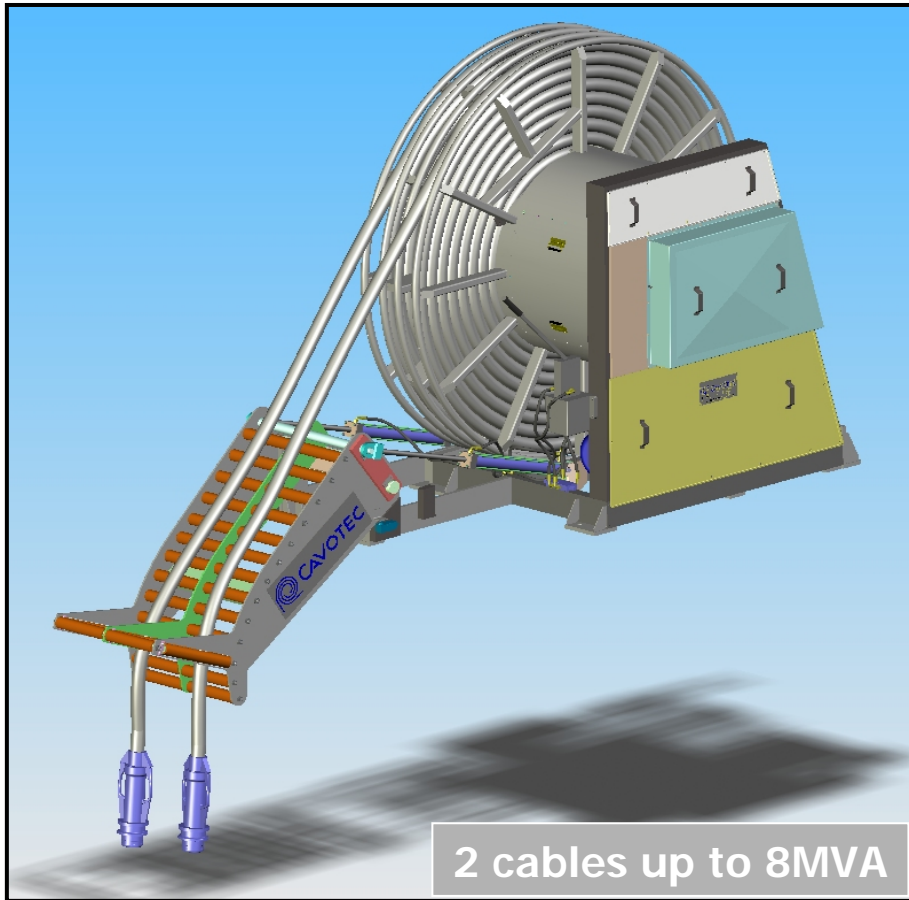
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**Ship side**



## Alternative Maritime Power

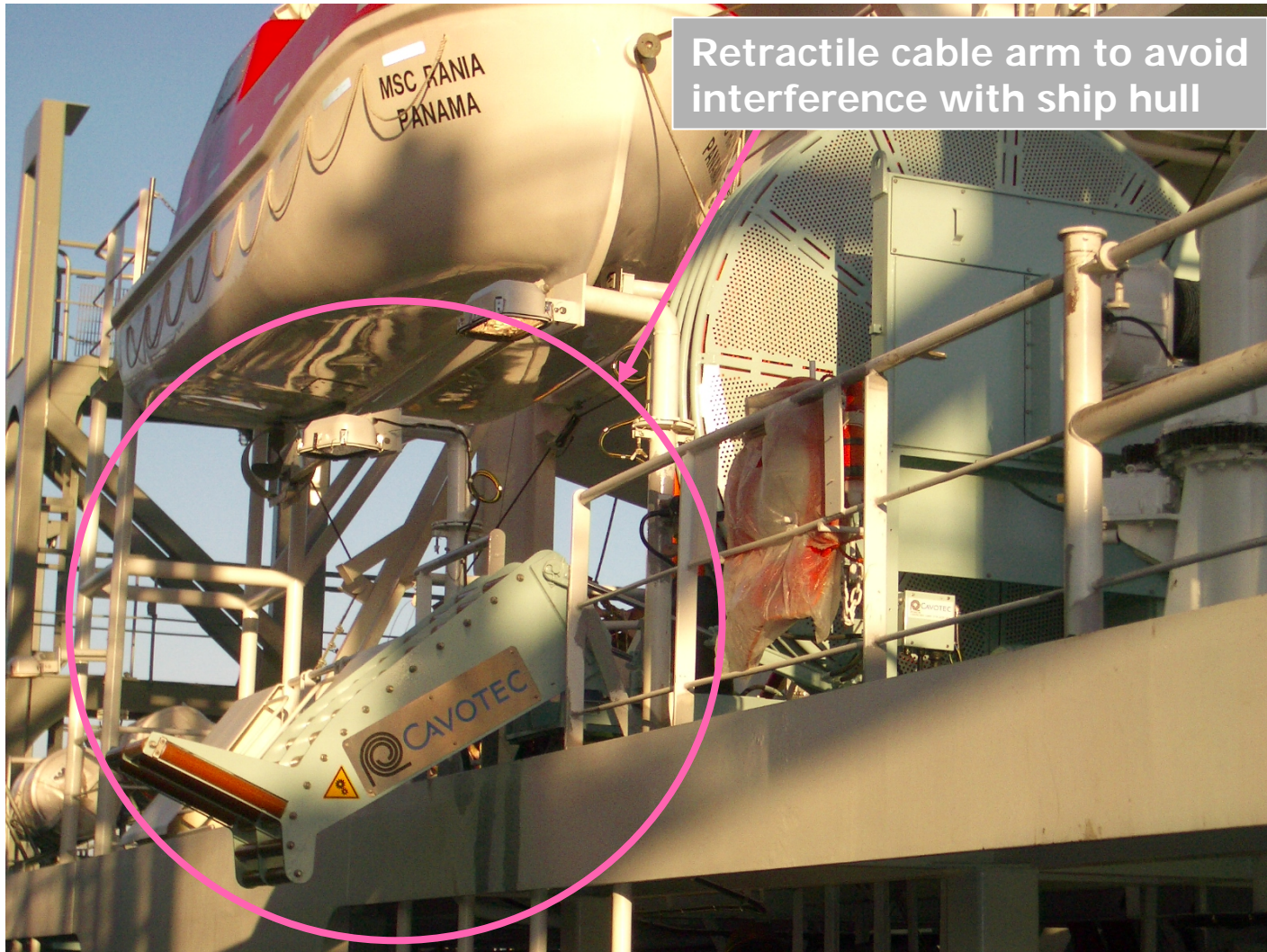
### Cable Management System on board





## Alternative Maritime Power

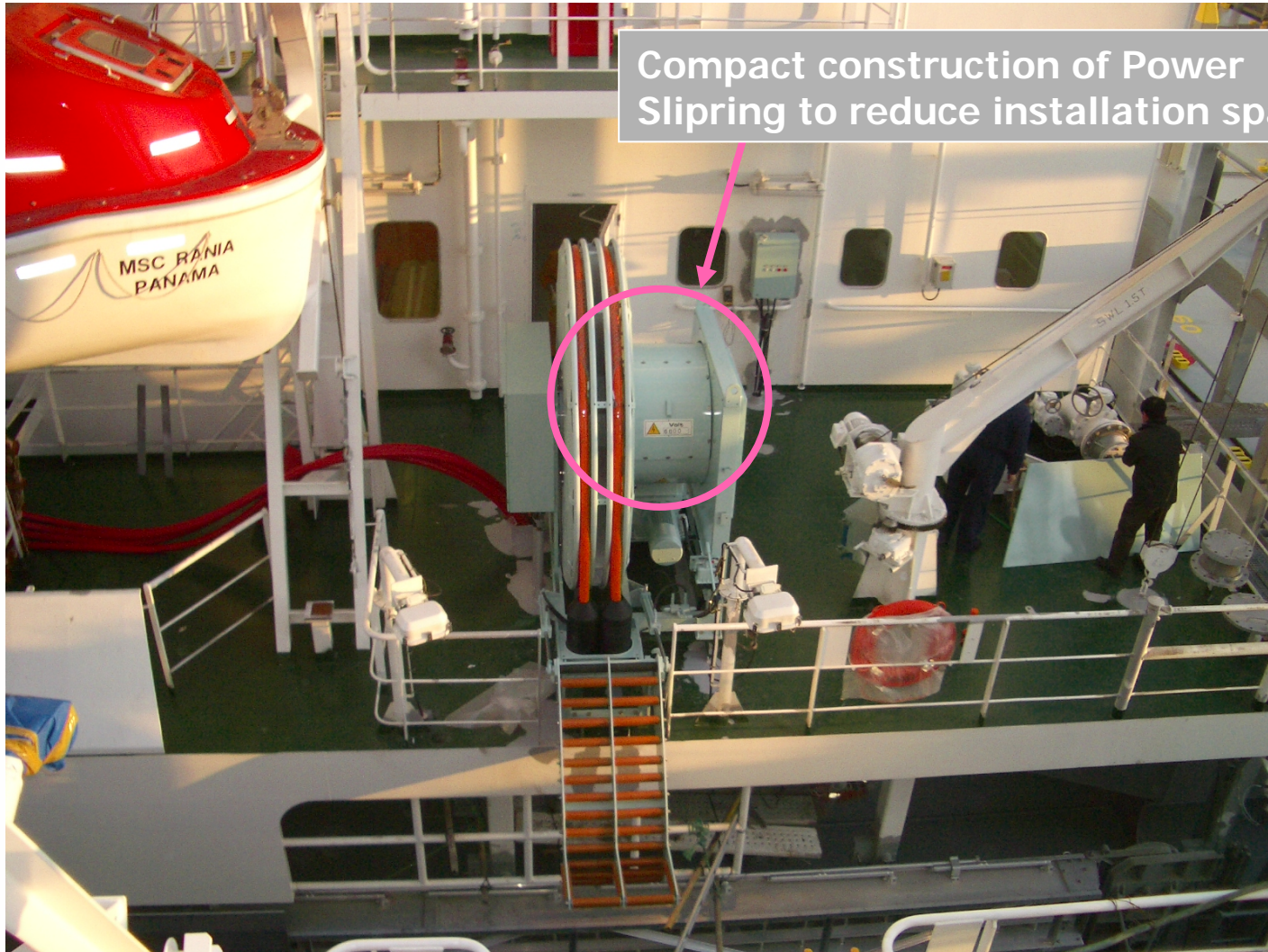
### Cable Management System on board





## Alternative Maritime Power

### Cable Management System on board



Compact construction of Power Slipping to reduce installation space



## Alternative Maritime Power

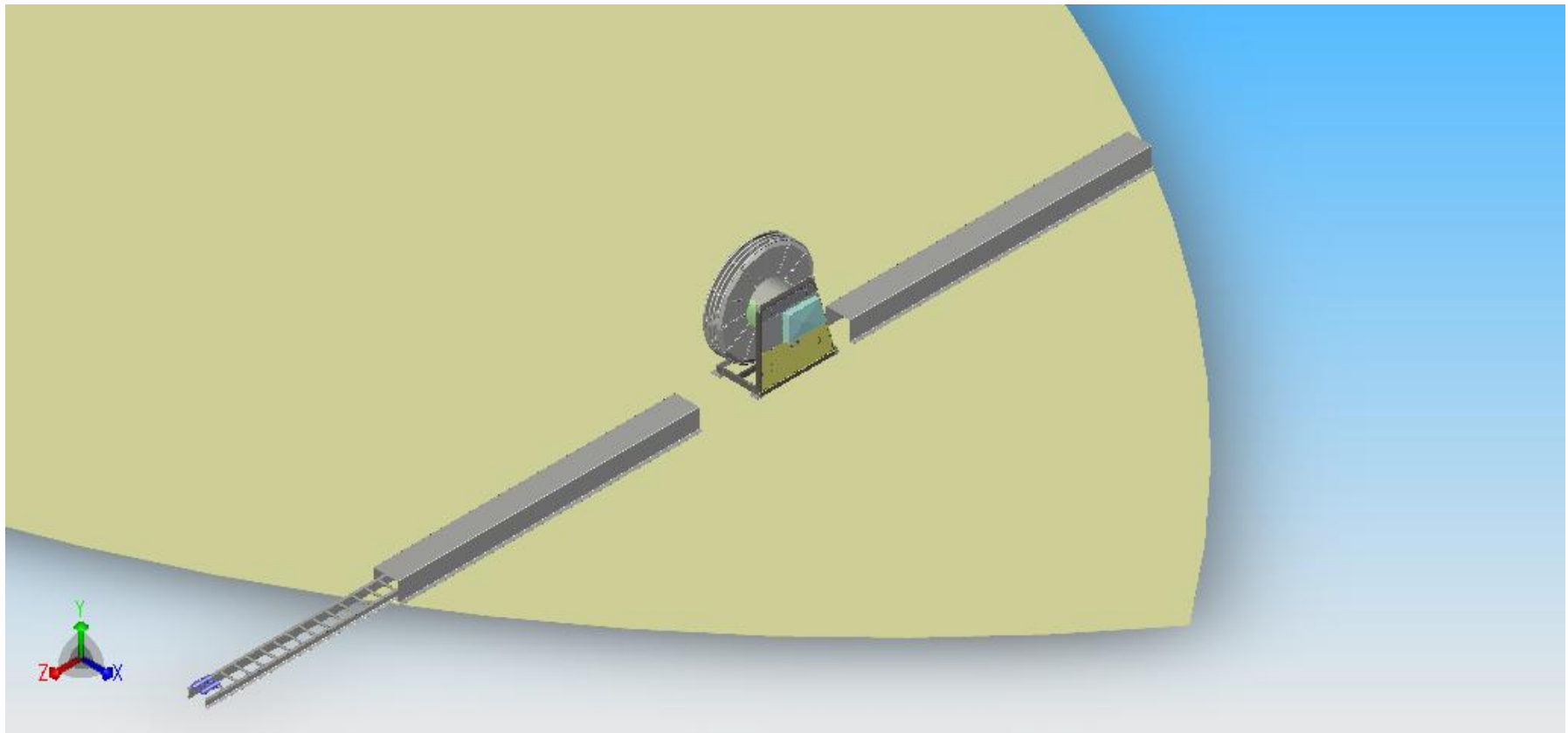
### Cable Management System on board





## Alternative Maritime Power

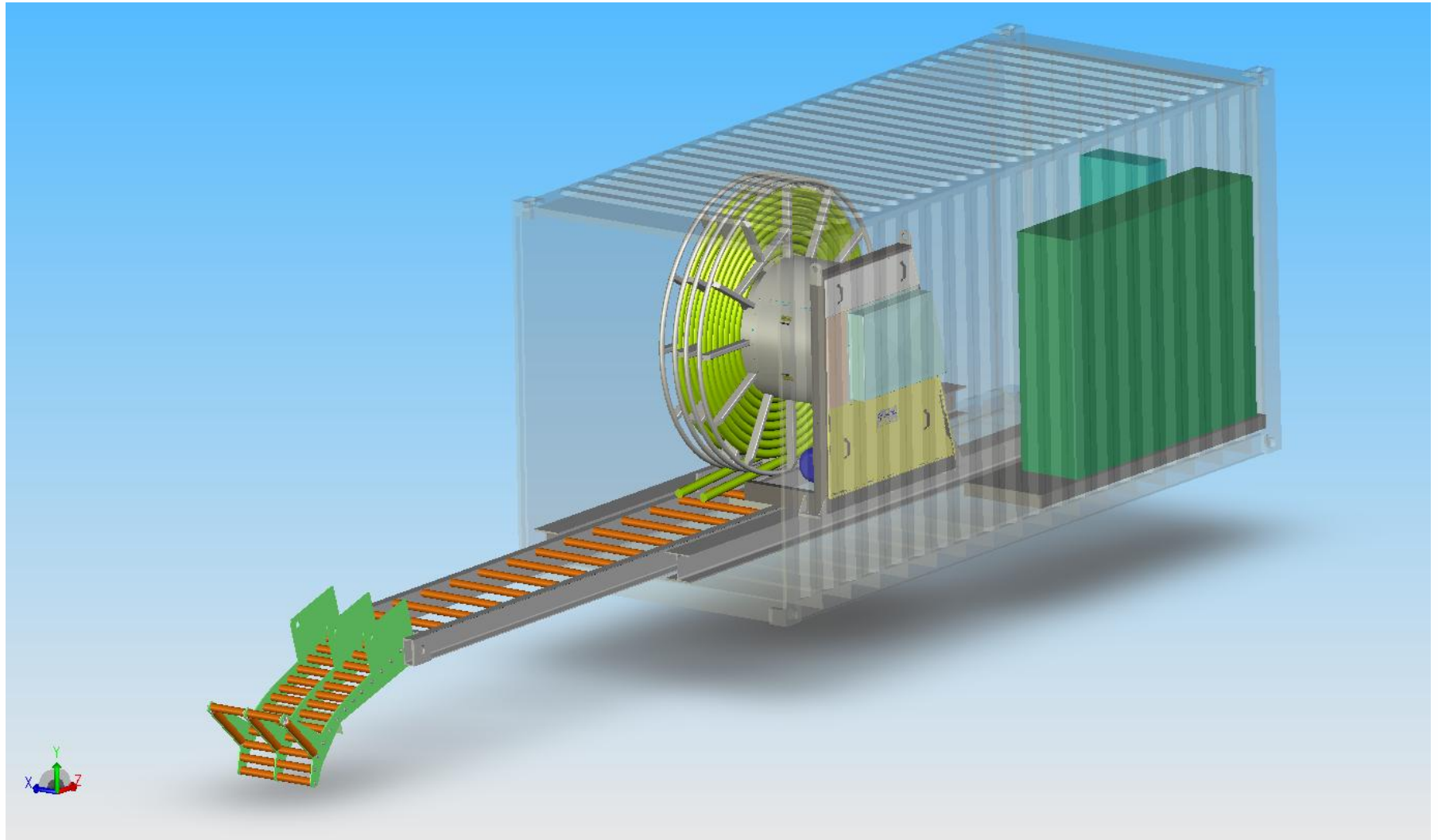
### Cable management system under deck





## Alternative Maritime Power

### Cable management system in container on ship





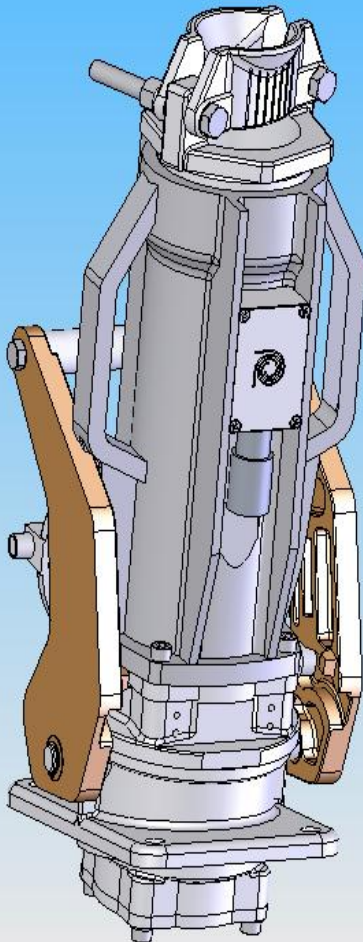
## Alternative Maritime Power

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**Shore side**

## Alternative Maritime Power

### Shore Junction Box



#### Plug/Socket

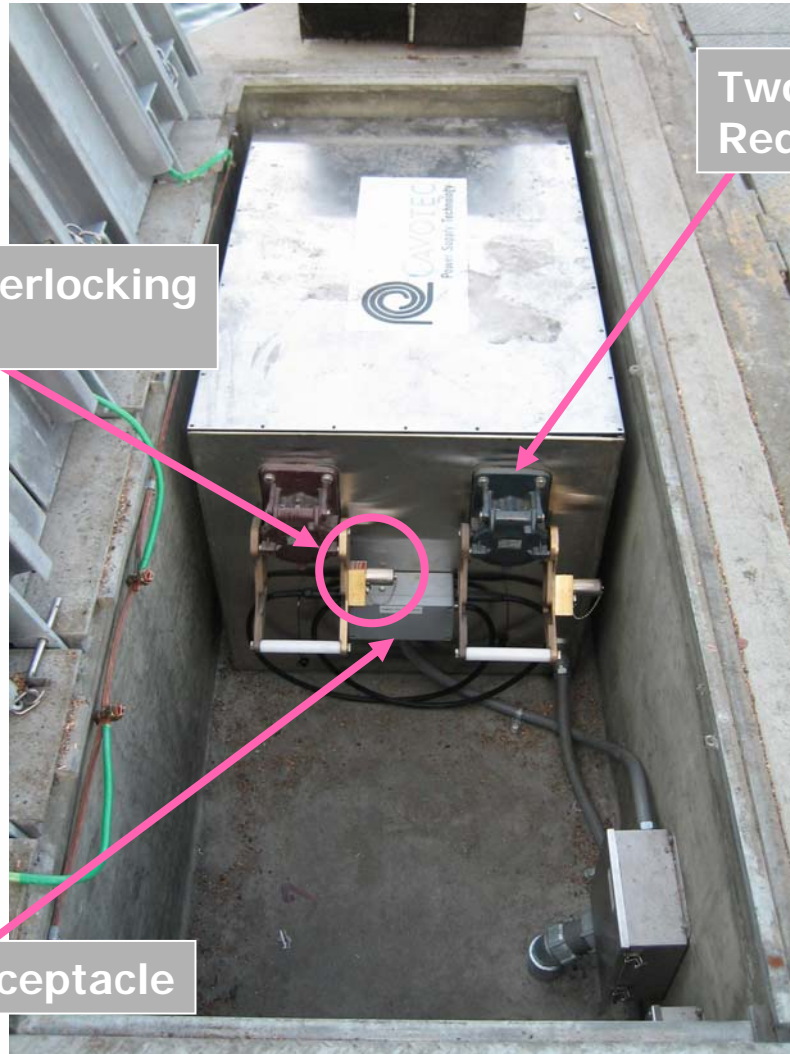
- Housing in tempered cast marine grade aluminium
- Weight less than 7 Kg
- IP 66 when connected and properly closed
- Fiber optic integrated in the plug housing

**Standard in POLA/POLB**



## Alternative Maritime Power

### Shore Junction Box



Two push-pull receptacle  
Red and Blue

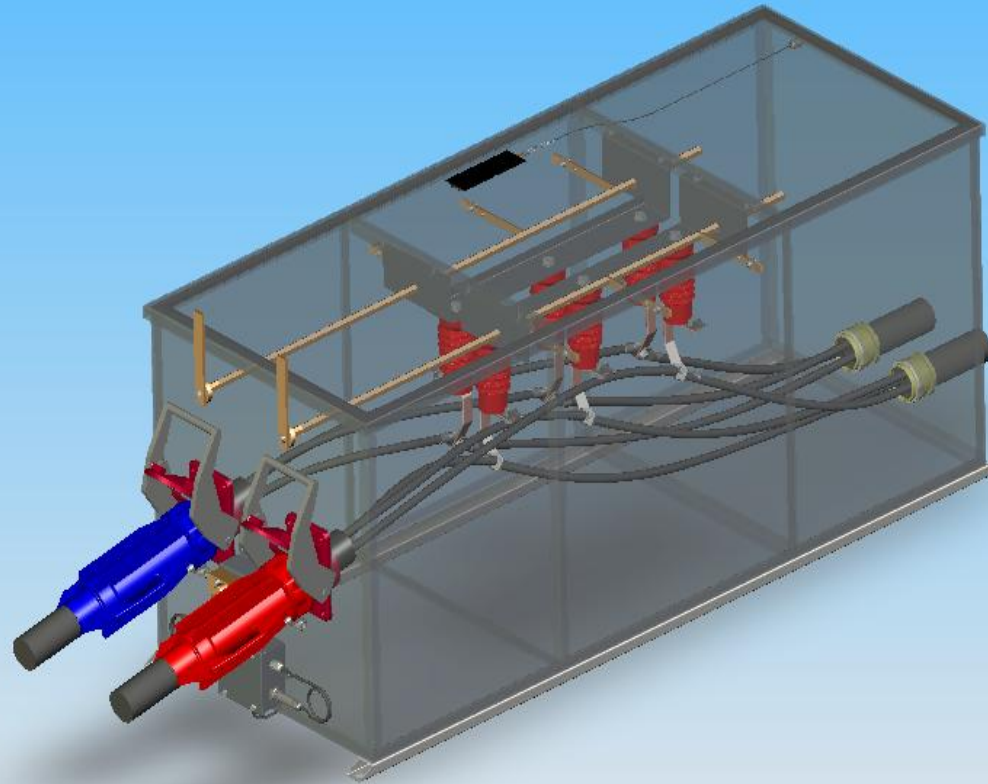
Kirk-Key safety interlocking  
system

Fibre Optic receptacle



## Alternative Maritime Power

### Junction box with electric static discharger



## Alternative Maritime Power

**An update of the AMP concept initiated  
by POLA 3 years ago**

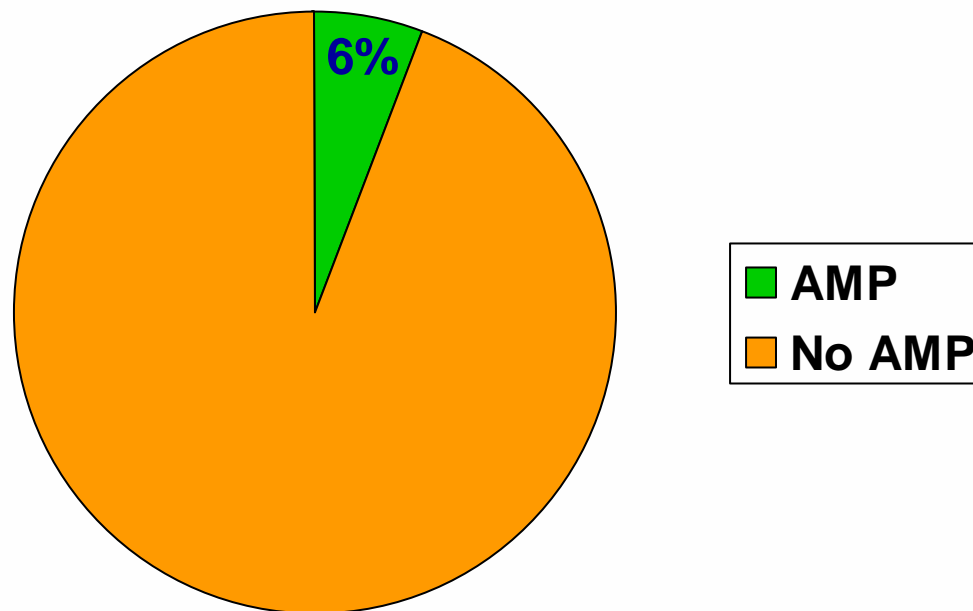


## Alternative Maritime Power

### Some statistics

### Container ships newbuildings, in units

From 2005 to 2008 the total newbuildings to be delivered are 896 ships of which 52 ships with AMP systems



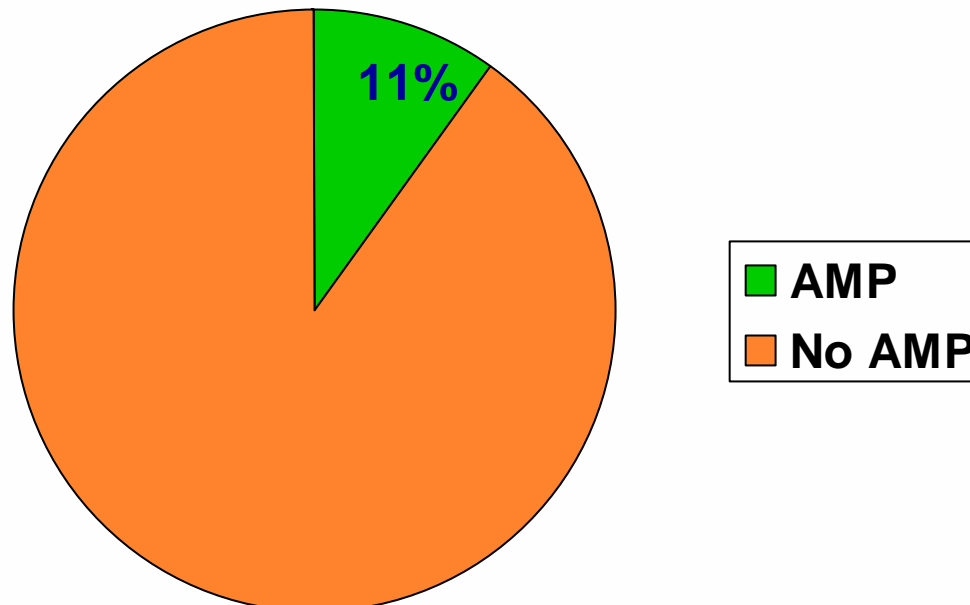


## Alternative Maritime Power

### Some statistics

## Container ships newbuildings, in units

From 2005 to 2008 the newbuildings over 5.000 TEU capacity to be delivered ,are 360 ships of which 40 ships with AMP systems



## Alternative Maritime Power

### Some statistics

#### Ocean going carriers committed/fitted with AMP

- NYK Japan
- CSL China
- Peter Doehle Germany
- NSB-Conti Germany
- Evergreen Taiwan
- MSC Switzerland
- CP Offen Germany for P&O
- Patjens Germany for P&O
- Yang Ming Taiwan
- B & N Transocean Finland
- China Shipping Lines
- Hansa Shipping
- Lloyd Triestino
- K-Lines

**Total 75 container ships delivered , on order or prepared for AMP**



## Alternative Maritime Power

### Shore Connection Solution for Aircrafts

**For aircrafts  
Shore Power  
Supply is a  
standard since  
40 years.**



**Cavotec Connectors  
2 x 260A**





## Alternative Maritime Power

**Airbus A 380 with Cavotec... AMP:  
Power is 360 KW ,shore 200 V to aircraft 200 V**





## Alternative Maritime Power

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**Will the container ships follow ???**



## Alternative Maritime Power

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**Thank you !**