

RV KILO MOANA FLOODING CASUALTY, JANUARY 6, 2012



A PLATFORM ON TWO SUBMARINES



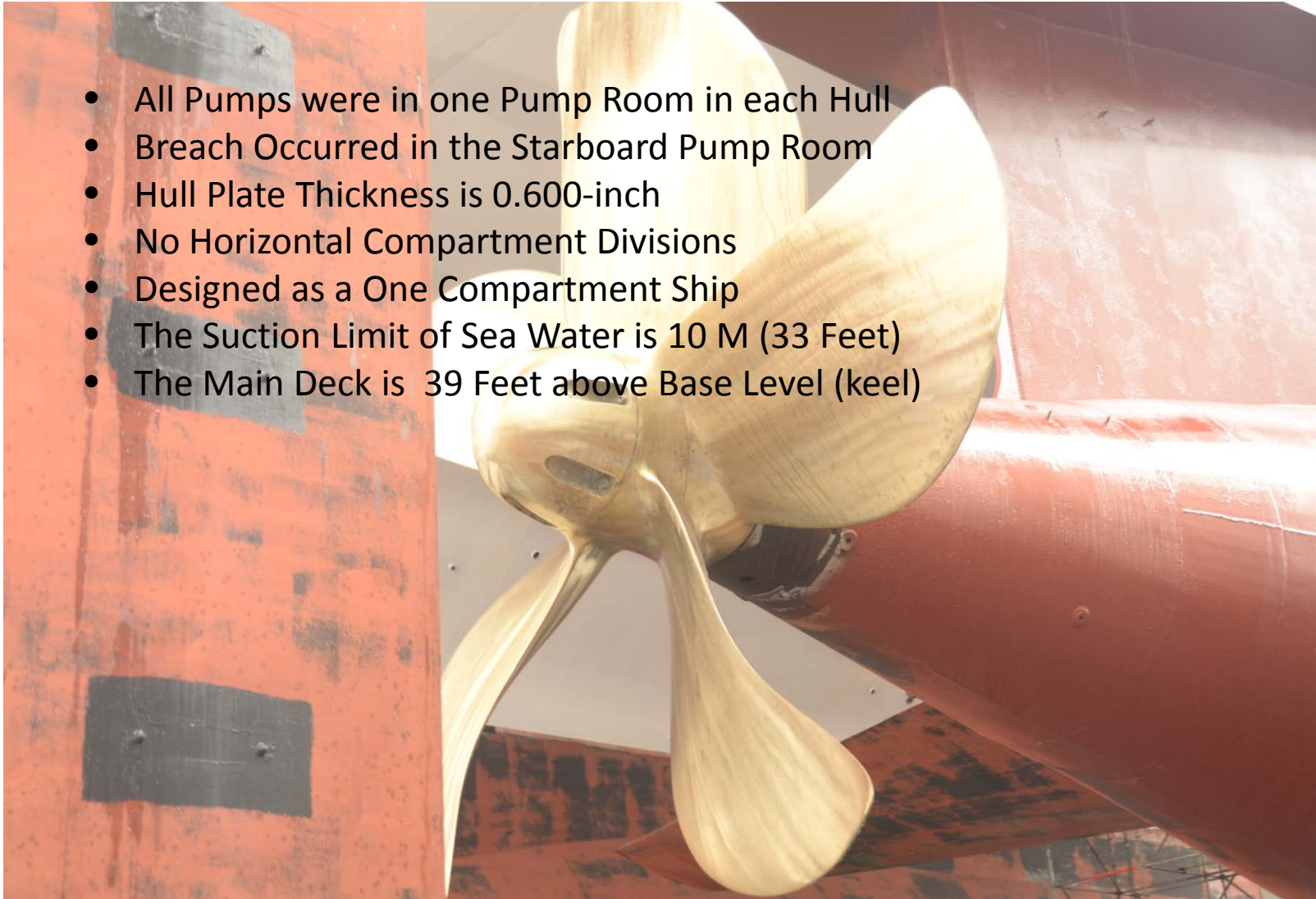
Small Water Area Twin Hull

- Beam – 88 Feet, Length 186 Feet
- Deep Draft – 25 Feet
- Extremely Sensitive to Weight Shifts
- Stable in Higher Sea Conditions
- Weight was a Prime Design Consideration

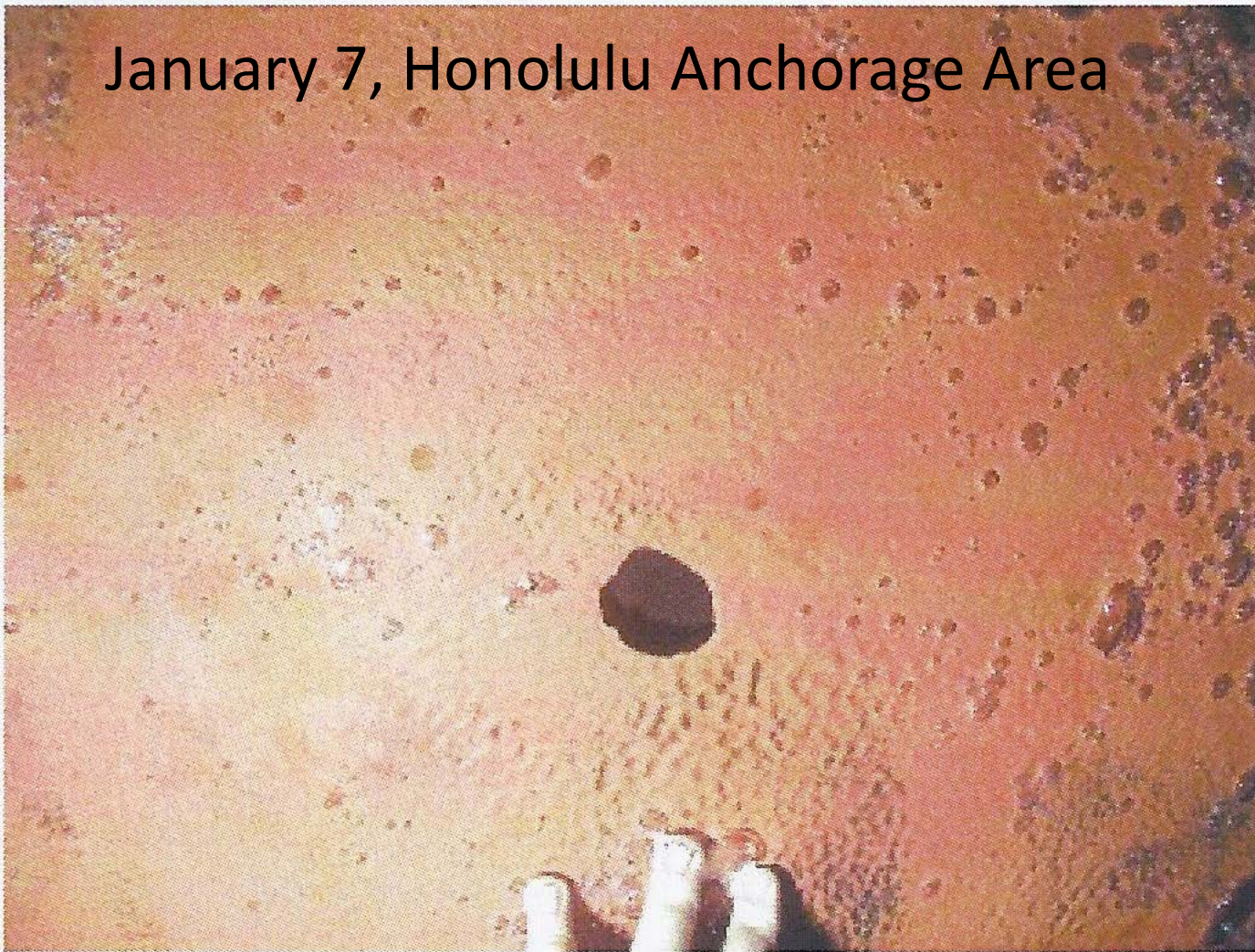


KILO MOANA DESIGN ISSUES

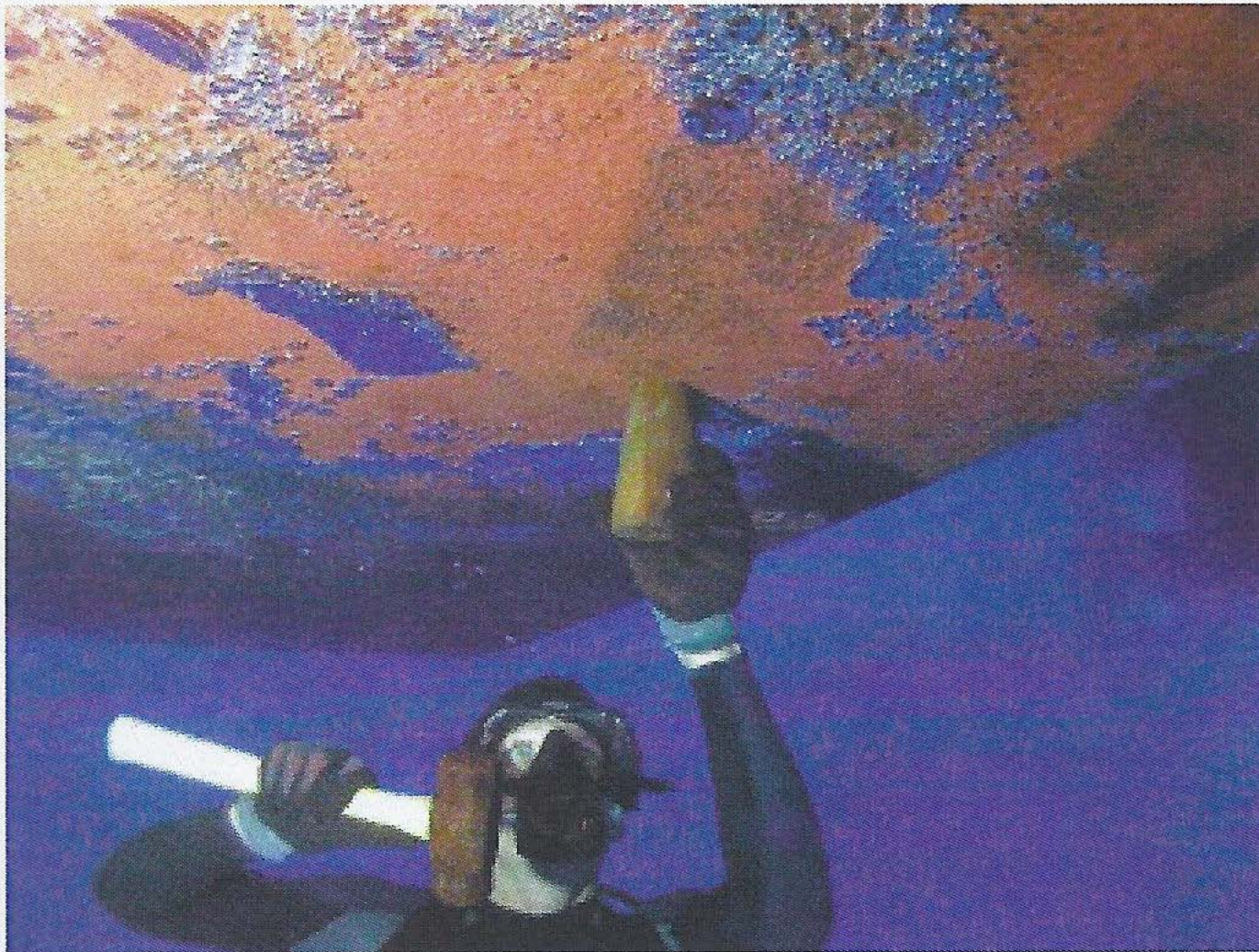
- All Pumps were in one Pump Room in each Hull
- Breach Occurred in the Starboard Pump Room
- Hull Plate Thickness is 0.600-inch
- No Horizontal Compartment Divisions
- Designed as a One Compartment Ship
- The Suction Limit of Sea Water is 10 M (33 Feet)
- The Main Deck is 39 Feet above Base Level (keel)



January 7, Honolulu Anchorage Area



2. The hole as found.



3. Installing the damage control plug. Point of view is looking aft (the port running gear is visible in the background).



5. Duct seal was used to fill in the gaps at the edges of the hole. At this point water was no longer entering the hull.

Bilge deck with suction foot valve removed. Note coffer dam and plug.



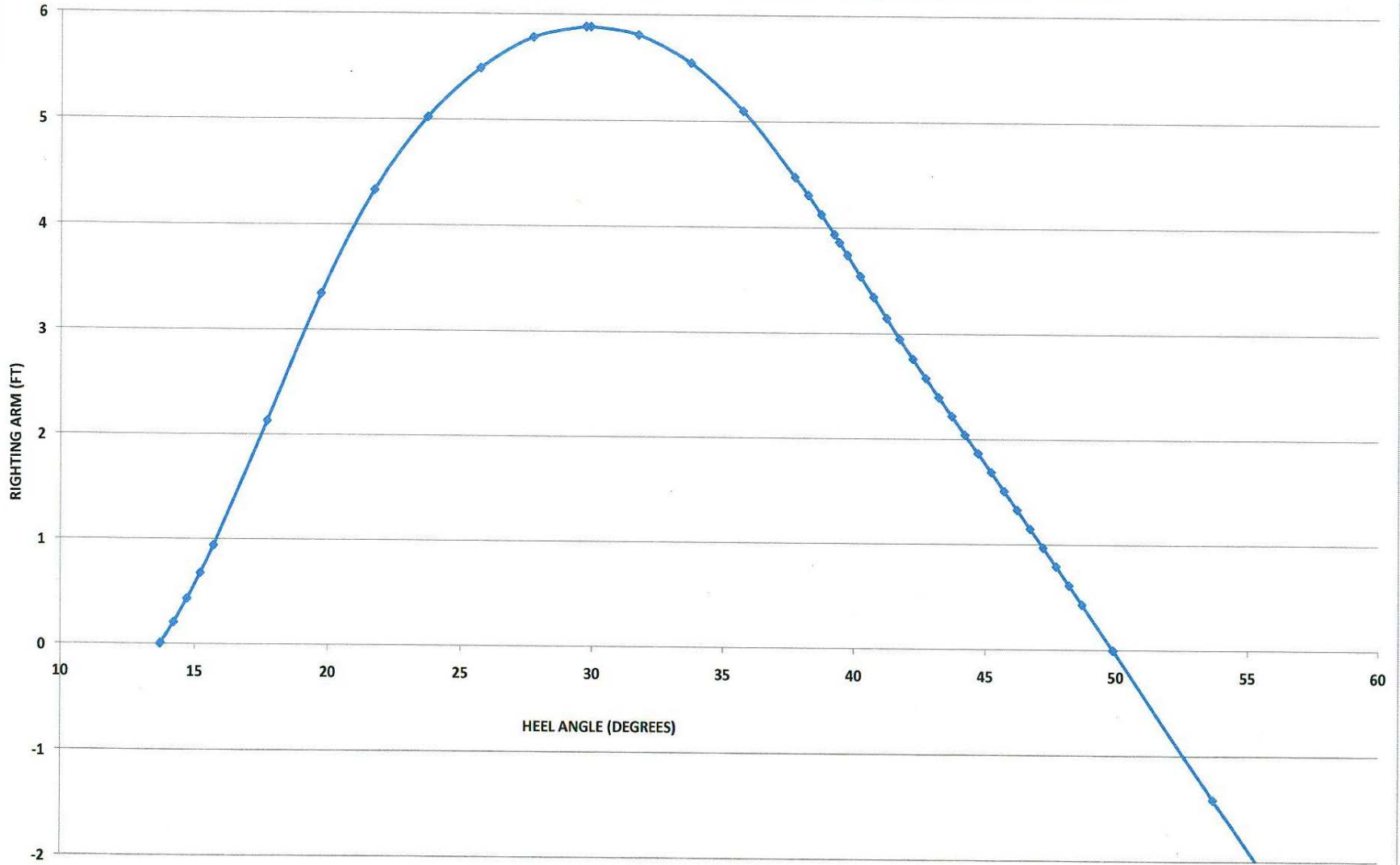
Causes?

- Galvanic Corrosion
- Electric Cell During High Velocity Flow
- Erosion
- Stray Currents
- Other Sites, only slight pitting

THE PLUGGED HOLE



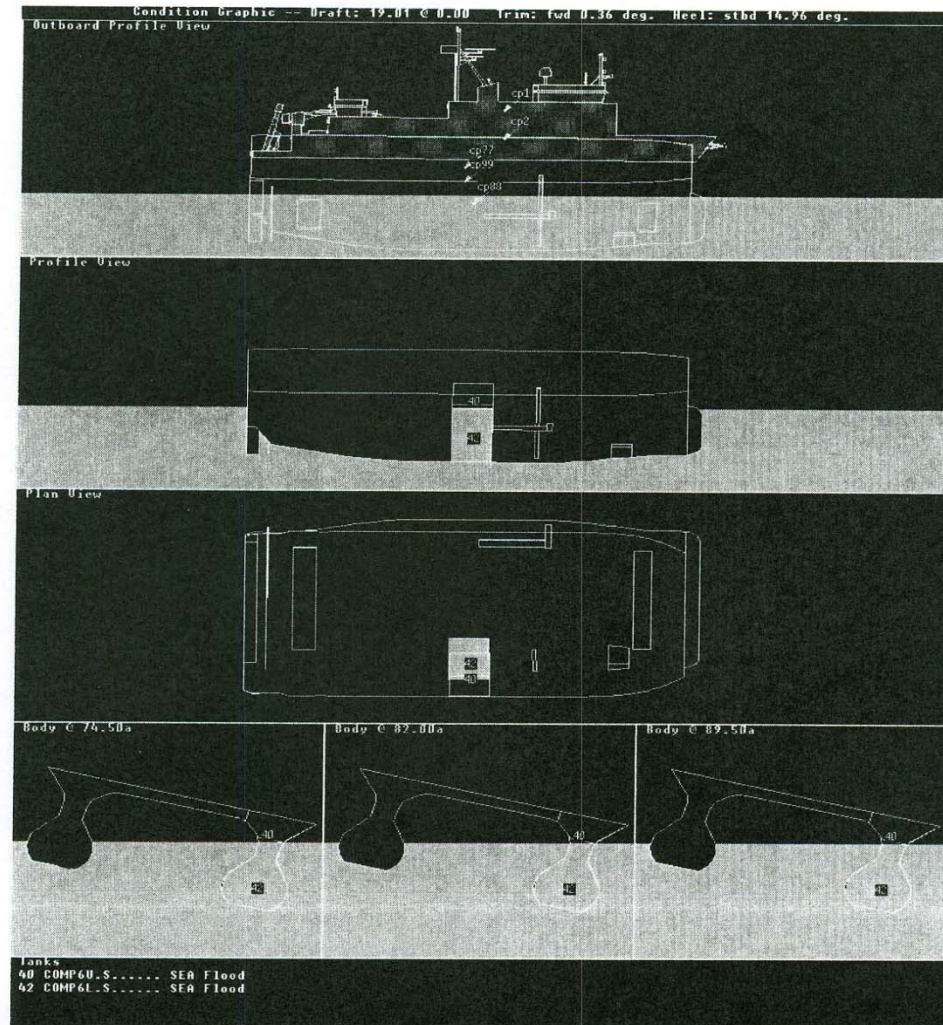
KILO MOANA RIGHTING ARM WITH FLOODED STARBOARD PUMP ROOM



DAMAGE SCENARIO

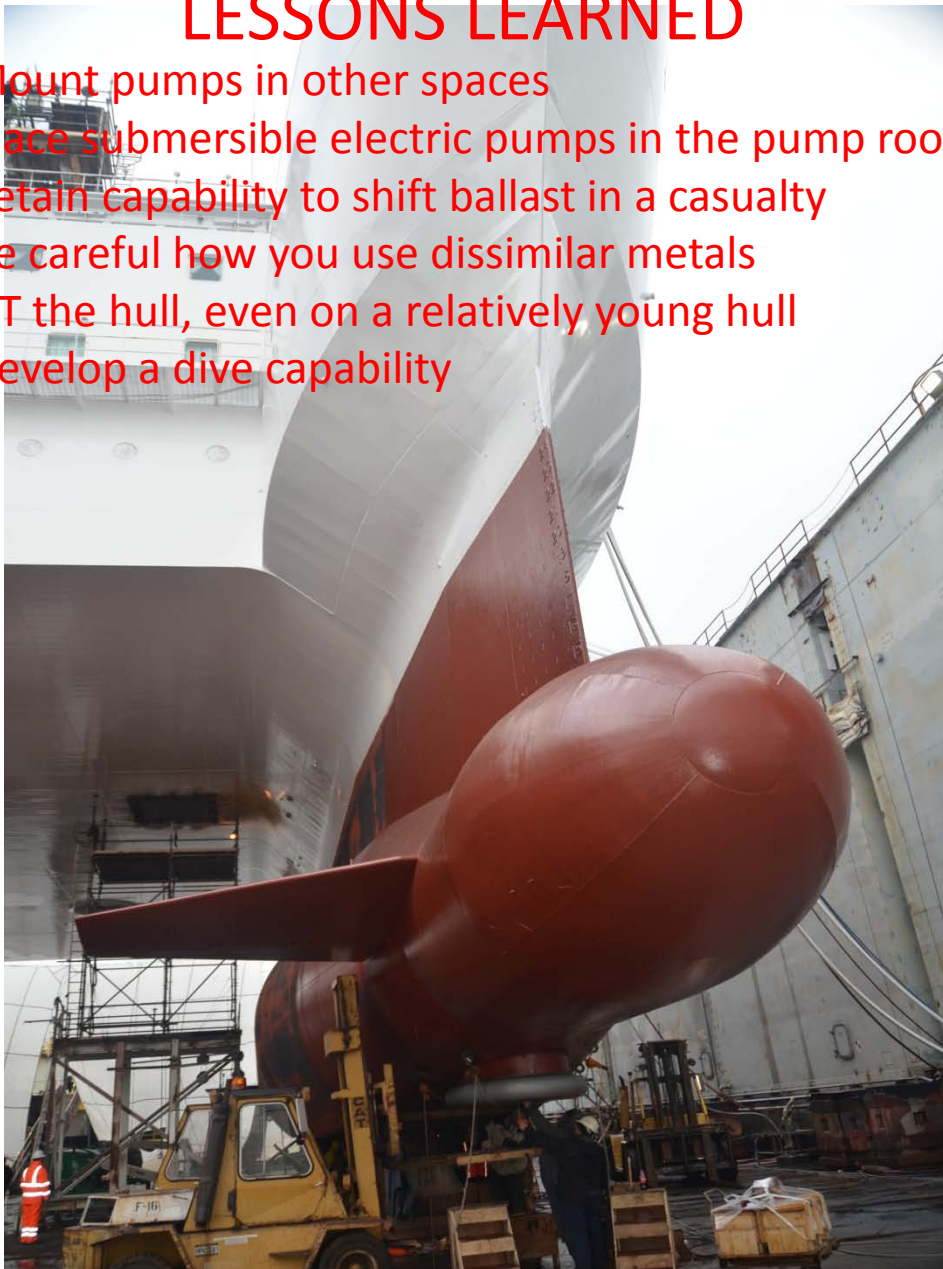
** DAMAGE:

1. MACHINERY ROOM NO.3 (S) FLOODED. (PERMEABILITY = 95%)
2. PUMP ROOM NO.1 & ACCESS (S) FLOODED. (PERMEABILITY = 95%)



LESSONS LEARNED

- Mount pumps in other spaces
- Place submersible electric pumps in the pump room
- Retain capability to shift ballast in a casualty
- Be careful how you use dissimilar metals
- UT the hull, even on a relatively young hull
- Develop a dive capability



ALOHA AND MAHALO

