DEFENCE R&D DÉFENSE

CFAV QUEST – Getting back to sea

Modifications to correct damaged stability issues

Brief to 2011 Research Vessel Operator's Committee

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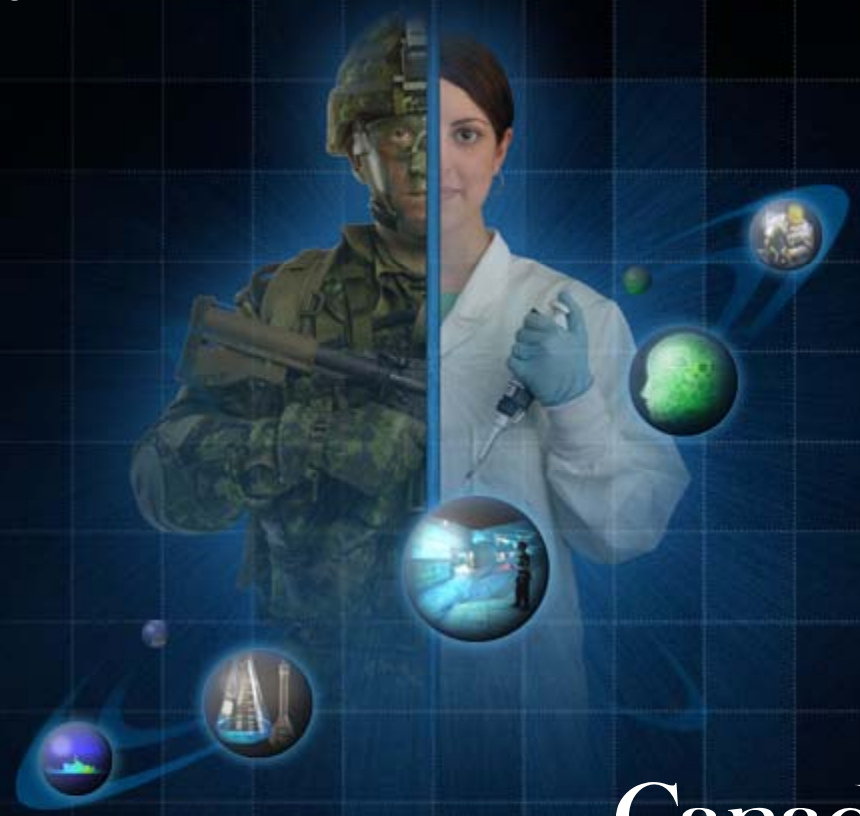
Manager / Technical Services

26-28 April 2011



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Outline

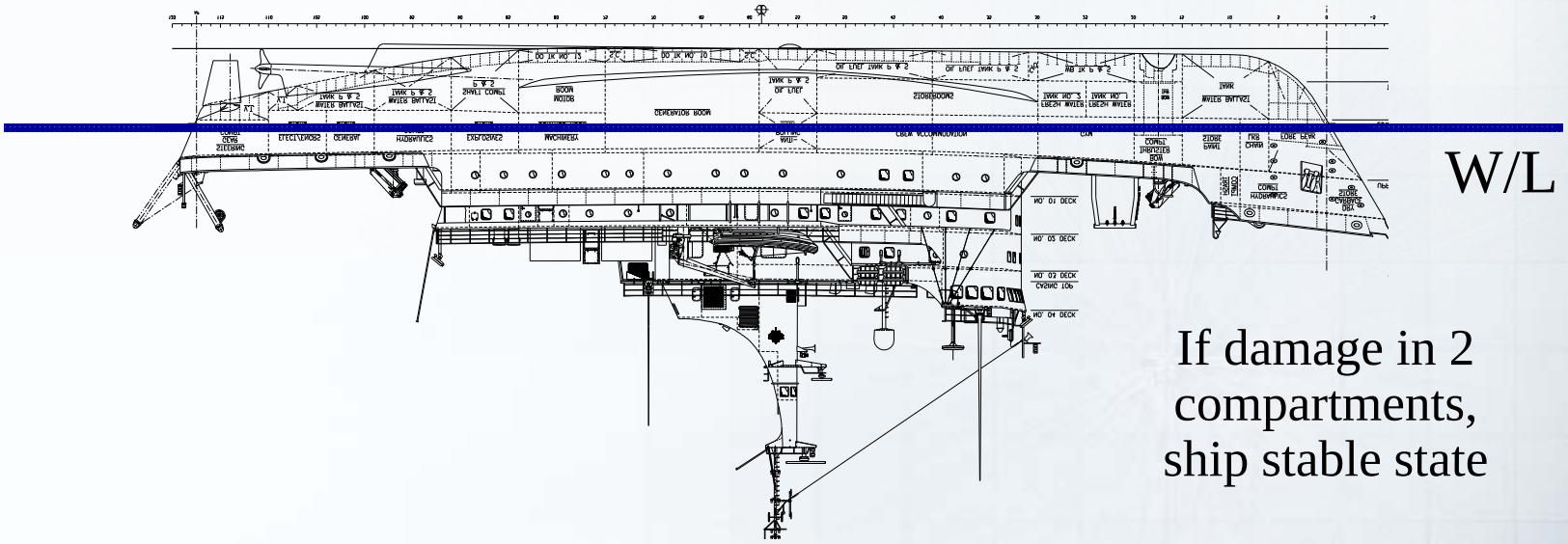
- Introduction – Problem Definition
- The Engineering Solution
- The work diary
- Questions

Introduction – Problem definition

- Ship underwent an inclining experiment in June 08
- When performing stability analysis following the incline, data obtained from experiment did not align with the last Manual of Trim and Stability done following the refit of 1999 (Sept 2009)
- Further analysis revealed that:
  - Assumptions made in the past were wrong and did not relate to any acceptable stability standards
  - Stability problems identified in 1986, but not correct in the 1997-1999 refit
  - New stability calculations exposed risk to ship and crew when ship in damage state (Nov 09)

Introduction – Problem definition

- Further analysis revealed that
  - Stability standard on 2 compartments flooding in a damage state not met



If damage in 2 compartments, ship stable state

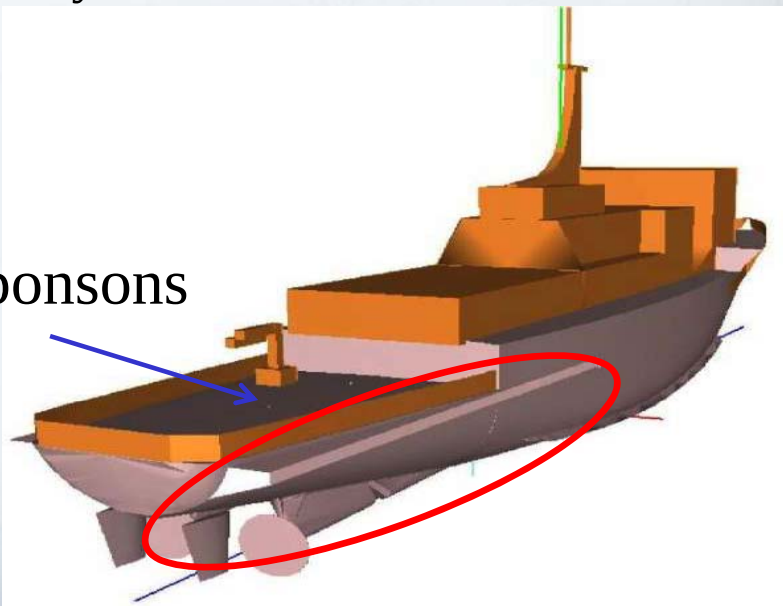
- Outcome: Dec 09 – Naval authorities order CFAV QUEST alongside pending resolution

The Engineering Solution

- Need for no.1 deck sub-division, increased buoyancy, reduction of weights
  - Part 1: Fitment of sponsons (water wing)
  - Part 2: Anti-roll tanks disabled
  - Part 3: Removal of fitted equipment
    - Forward LAT Frame
    - General Purpose Oceanographic system

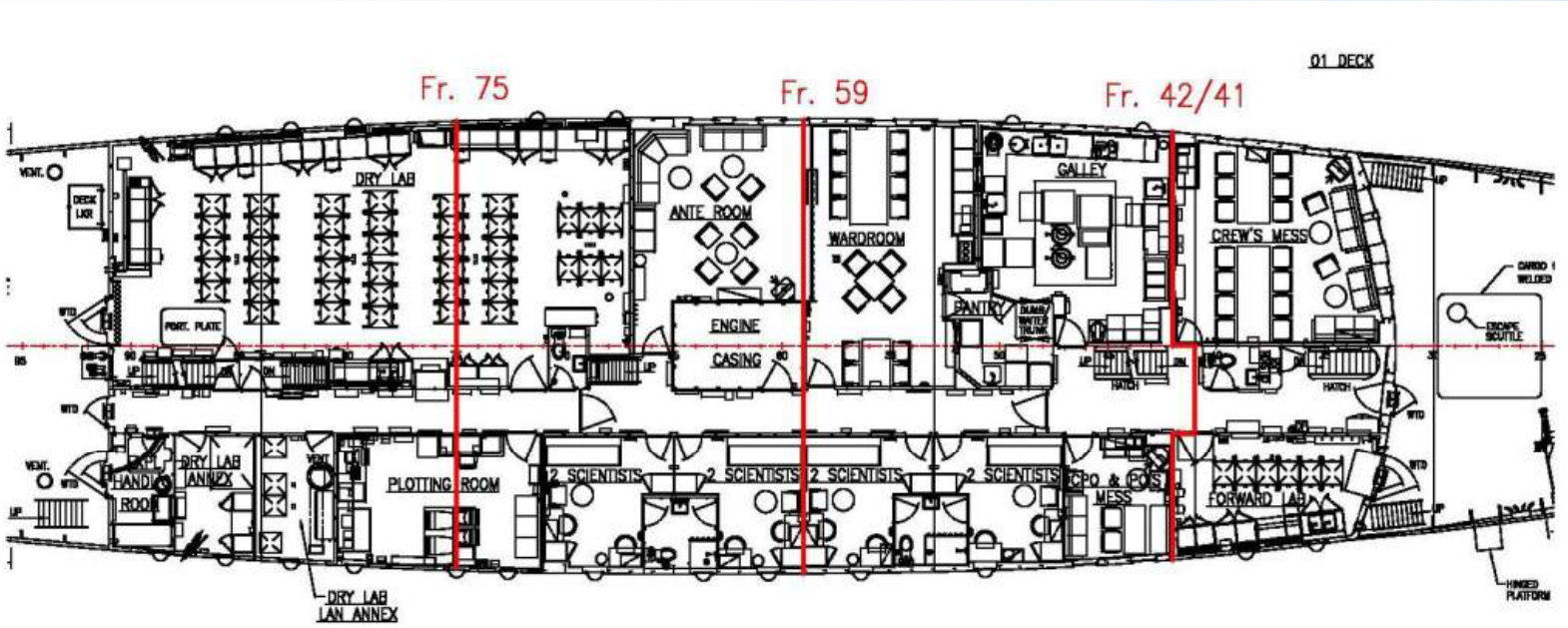
Fwd
Lat
Frame

Sponsons



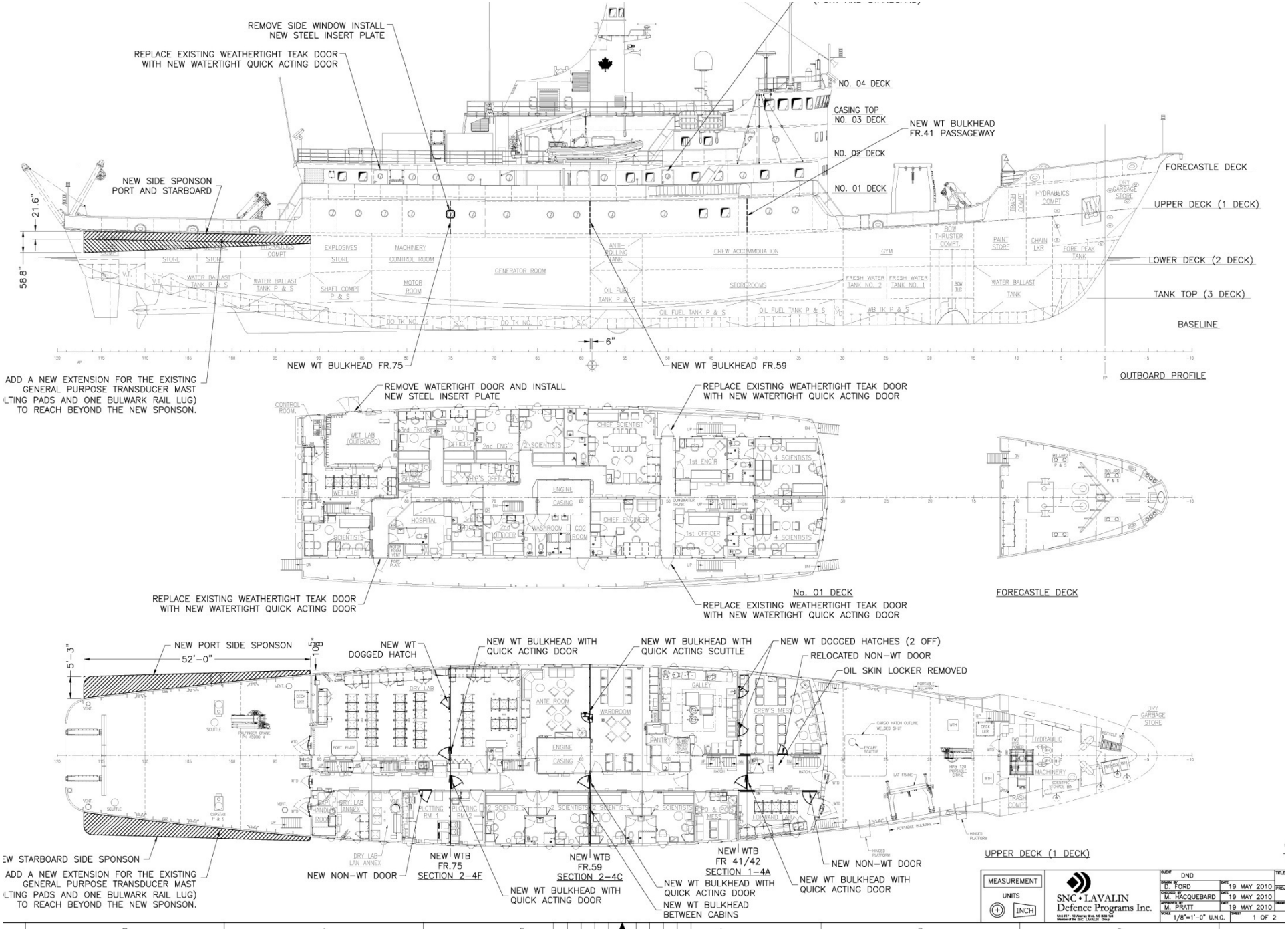
The Engineering Solution

- Need for no.1 deck subdivision, increased buoyancy, reduction of weights
  - Part 4: Limitation of the scientific payload (from 70LT to 50LT) – 20LT max on flight deck
  - Part 5: Insertion of subdivisions
  - Part 6: Mushroom vent isolation (weld deck / Quarter deck)

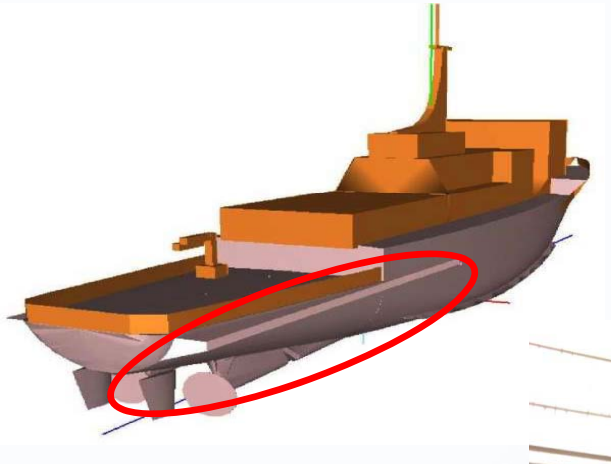


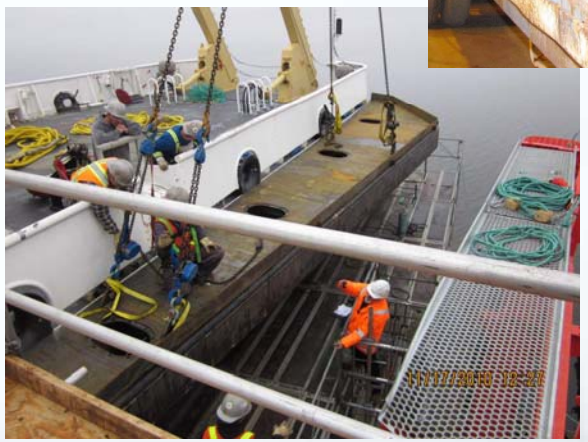
The Engineering Solution

- Take the opportunity to improve ship while ship alongside for the stability work
  - Change switchboard and electrical cable to generators
  - Modify ship's mast in support of Q340 trial on signature management
- Prepare ship for trials upon return to service

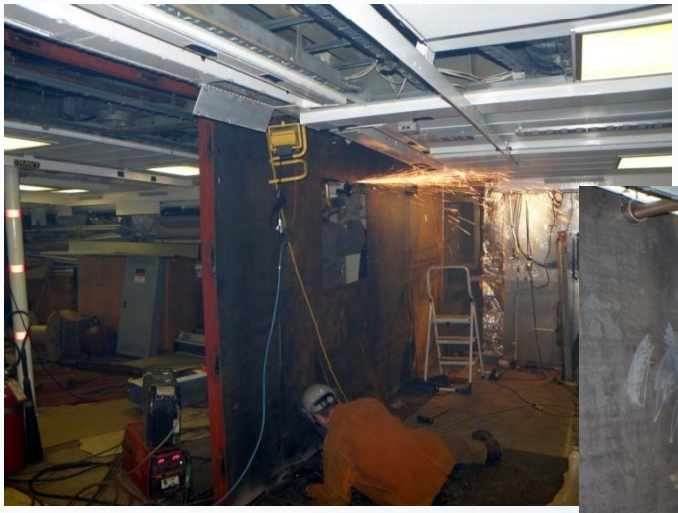

REMOVE SIDE WINDOW INSTALL NEW STEEL INSERT PLATE
REPLACE EXISTING WEATHERTIGHT TEAK DOOR WITH NEW WATERTIGHT QUICK ACTING DOOR
NO. 04 DECK
CASING TOP NO. 03 DECK
NEW WT BULKHEAD FR.41 PASSAGEWAY
NO. 02 DECK
NO. 01 DECK
NEW SIDE SPONSON PORT AND STARBOARD
21.6"
58.8"
FORECASTLE DECK
UPPER DECK (1 DECK)
LOWER DECK (2 DECK)
TANK TOP (3 DECK)
BASELINE
6"
NEW WT BULKHEAD FR.75
NEW WT BULKHEAD FR.59
OUTBOARD PROFILE
ADD A NEW EXTENSION FOR THE EXISTING GENERAL PURPOSE TRANSDUCER MAST ILTING PADS AND ONE BULWARK RAIL LUG) TO REACH BEYOND THE NEW SPONSON.
REMOVE WATERTIGHT DOOR AND INSTALL NEW STEEL INSERT PLATE
REPLACE EXISTING WEATHERTIGHT TEAK DOOR WITH NEW WATERTIGHT QUICK ACTING DOOR
REPLACE EXISTING WEATHERTIGHT TEAK DOOR WITH NEW WATERTIGHT QUICK ACTING DOOR
REPLACE EXISTING WEATHERTIGHT TEAK DOOR WITH NEW WATERTIGHT QUICK ACTING DOOR
No. 01 DECK
FORECASTLE DECK
NEW PORT SIDE SPONSON
52'-0"
5'-3"
10.5"
NEW WT DOGGED HATCH
NEW WT BULKHEAD WITH QUICK ACTING DOOR
NEW WT BULKHEAD WITH QUICK ACTING SCUTTLE
NEW WT DOGGED HATCHES (2 OFF)
RELOCATED NON-WT DOOR
OIL SKIN LOCKER REMOVED
NEW STARBOARD SIDE SPONSON
ADD A NEW EXTENSION FOR THE EXISTING GENERAL PURPOSE TRANSDUCER MAST ILTING PADS AND ONE BULWARK RAIL LUG) TO REACH BEYOND THE NEW SPONSON.
NEW NON-WT DOOR
NEW WTB FR.75 SECTION 2-4F
NEW WT BULKHEAD WITH QUICK ACTING DOOR
NEW WTB FR.59 SECTION 2-4C
NEW WT BULKHEAD WITH QUICK ACTING DOOR
NEW WT BULKHEAD BETWEEN CABINS
NEW WTB FR 41/42 SECTION 1-4A
NEW WT BULKHEAD WITH QUICK ACTING DOOR
NEW NON-WT DOOR
UPPER DECK (1 DECK)
MEASUREMENT UNITS INCH
SNC • LAVALIN Defence Programs Inc.
CLIENT DND
DRAWN BY D. FORD 19 MAY 2010
CHECKED BY M. HACQUEBARD 19 MAY 2010
APPROVED BY M. PRATT 19 MAY 2010
SCALE 1/8"=1'-0" U.N.O.
SHEET 1 OF 2

Sponsons fitment



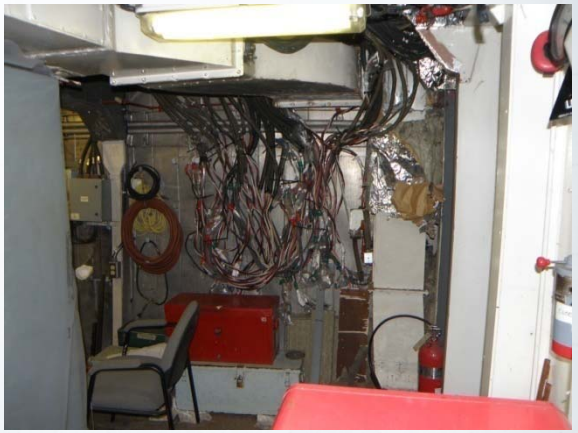


Bulkhead Insertion – Scientific Spaces



Bulkhead Insertion – Crew Mess / Wardroom

Switchboard work

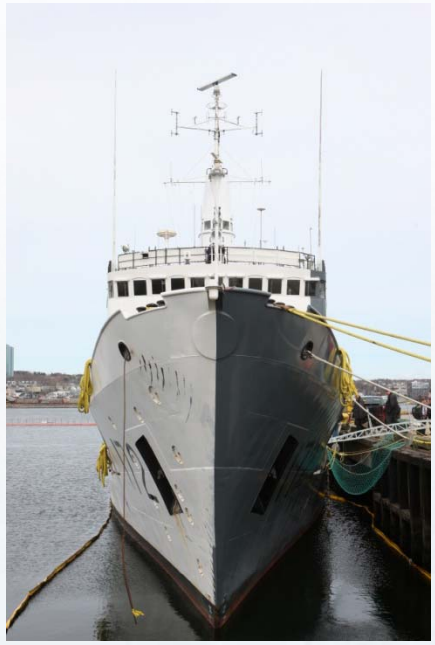


Upper Deck Vents

Doors and access ways

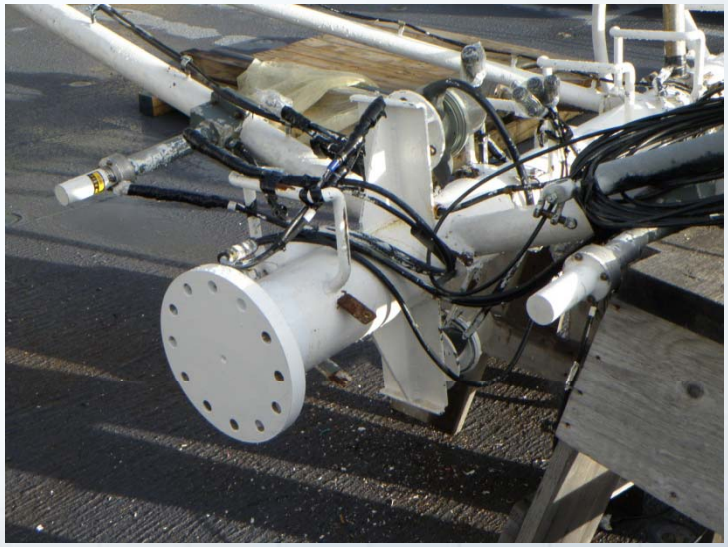
Trials Preparations
Q340 Signature Management

- Ship painting – Port side Grey



Trials Preparations
Q340 Signature Management

- Mast modifications (reduce length of pole)

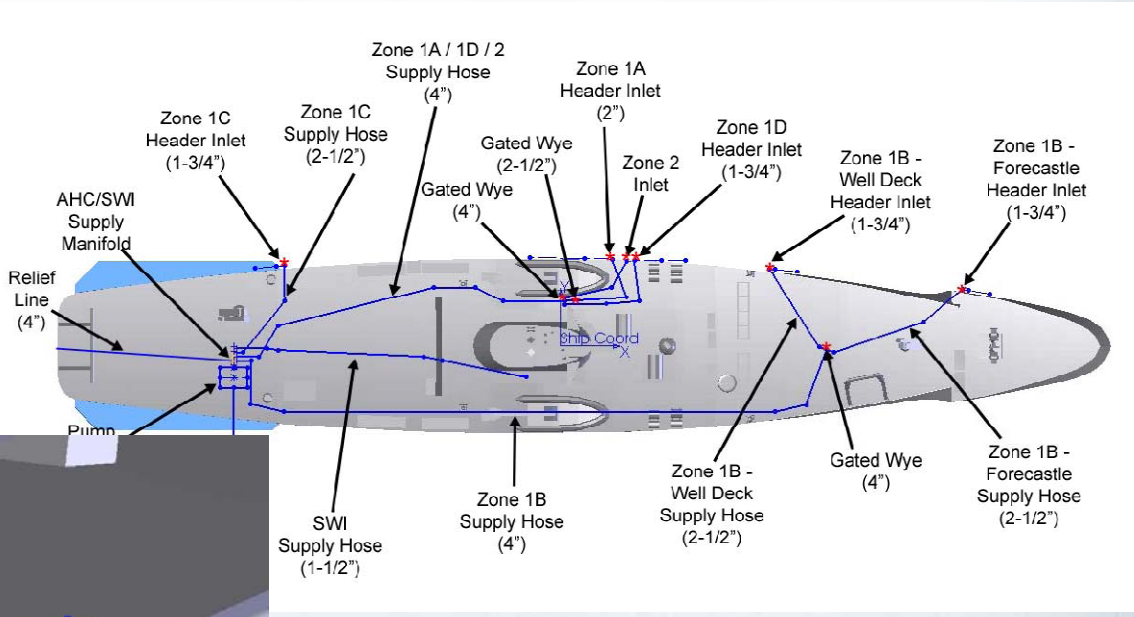


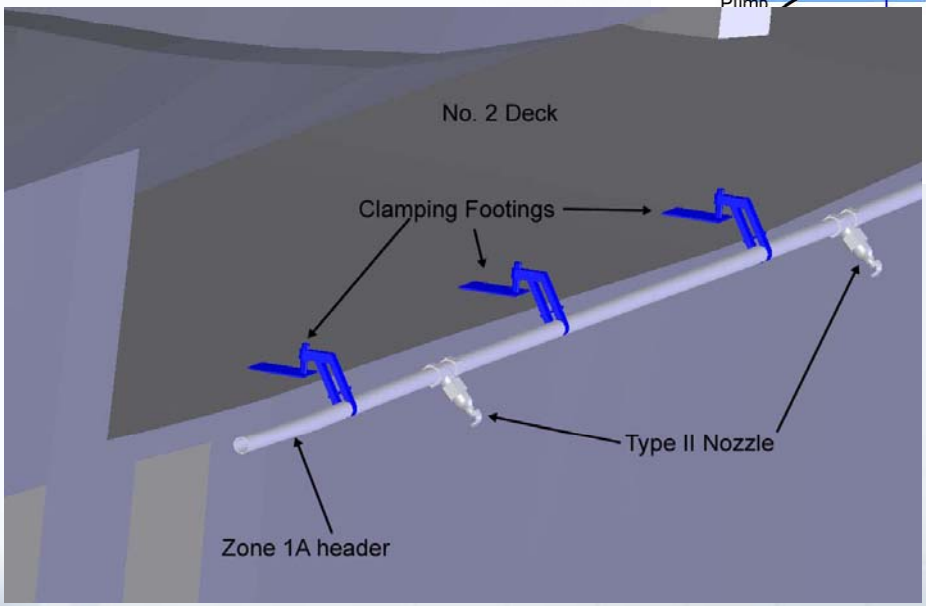
Trials Preparations
Q340 Signature Management

- IR curtains

Trials Preparations
Q340 Signature Management

- Active hull cooling piping system

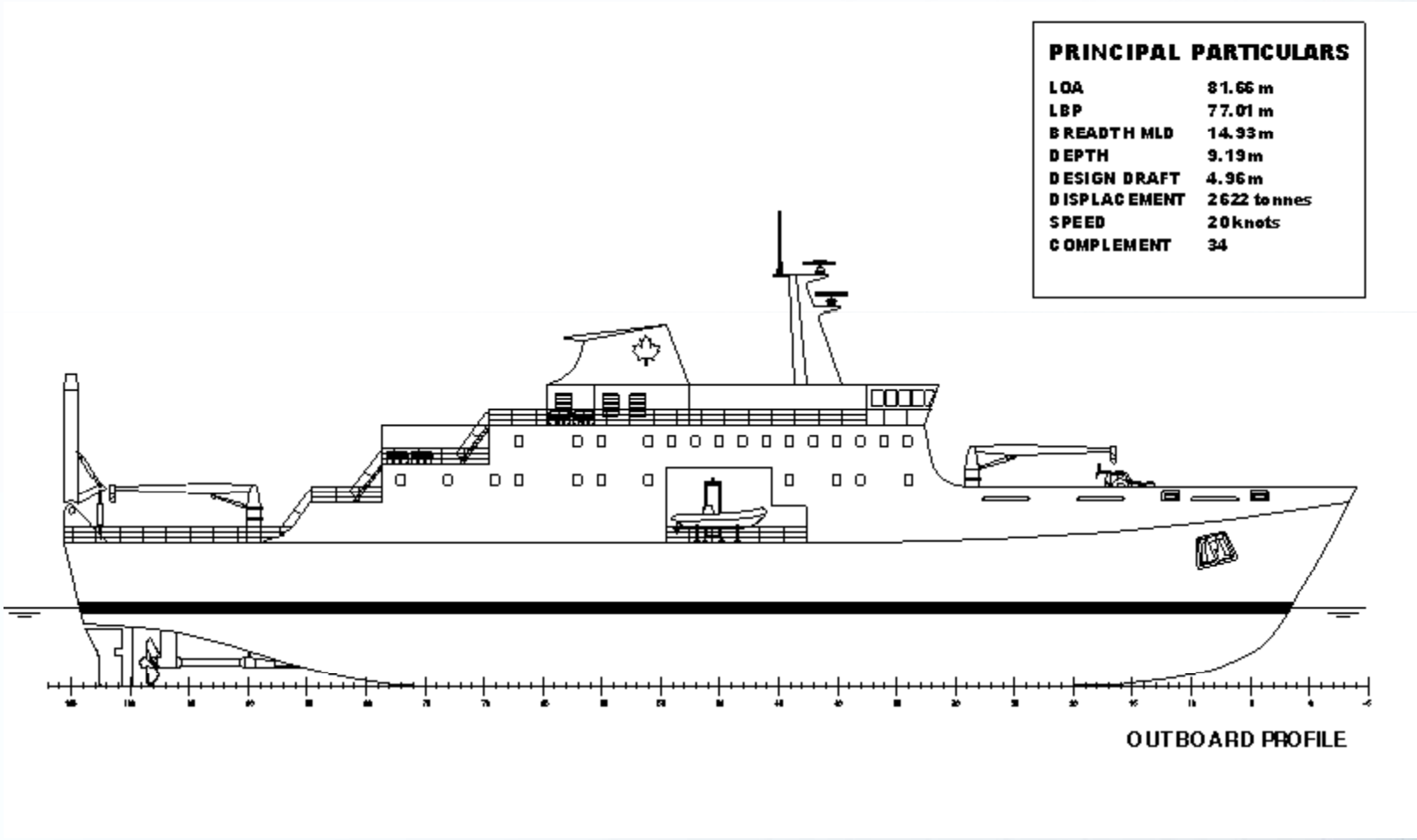




What's Next?

- Inclining Experiment: 18 – 22 April 2011
- Harbour and Sea trials: 25 – 29 April 2011
- MOSH/SOLAS survey: April 2011
- Trials Q338 start: 9 May 2011
- Procurement delayed due to Canadian election
  - Marine Sanitation Device (MSD): ?
  - New Radars – Vision Masters: ?
  - UPS cooling system: ?
  - 400KW Generators: ?

New RV Concept – QUEST Replacement



Questions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