

NAVY AND COAST GUARD VESSELS



The Queen Elizabeth Class Aircraft Carrier

Royal Navy

2008 - 13

Clients: BVT Surface Fleet Ltd.,
BAE Systems Surface Ships Ltd and
Babcock International.

ICE Scope of work:

Technical assistance - Piping &
Outfitting.



Mid-Shore Patrol Vessel (MSPV)

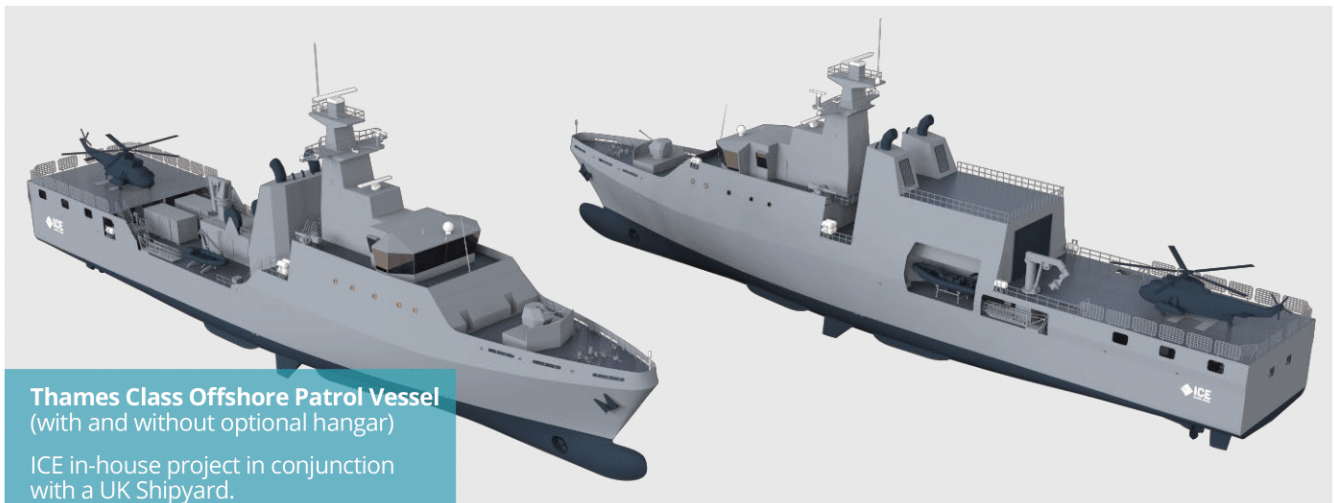
Canadian Coast Guard

2010 - 13

Client / Shipyard: Irving Shipbuilding
Inc. (ISI) Halifax, Nova Scotia, Canada

ICE Scope of work:

Basic design (Class: LR), 3-D model,
all detail design, production
information, procurement assistance
and general trouble-shooting during
construction and commissioning.



Thames Class Offshore Patrol Vessel (with and without optional hangar)

ICE in-house project in conjunction
with a UK Shipyard.



Apa P121 - Amazonas-class Offshore Patrol Vessel (OPV)

Offshore Patrol Vessel (OPV) 90m

2007 -09

Brazilian Navy

Client: VT Shipbuilding , UK

Main contractor at time of commissioning:

BVT Surface Fleet Ltd., UK

ICE Scope of Work:

Detail Design for Hull and Outfitting for complete ship, incl. technical assistance on-site.

Frigate Type 22 Upgrade

2004 -05

Romanian Navy

Customer: BAE Systems, UK

ICE Scope of Work:

Basic design hull, various structural analyses, 3-D Tribon model, technical assistance on-site.

The work was performed in Portsmouth, England and Galati, Romania.



Regele Ferdinand F-221 - Type 22 Class Frigate



74.8m FAC/OPV/Missile Vessel

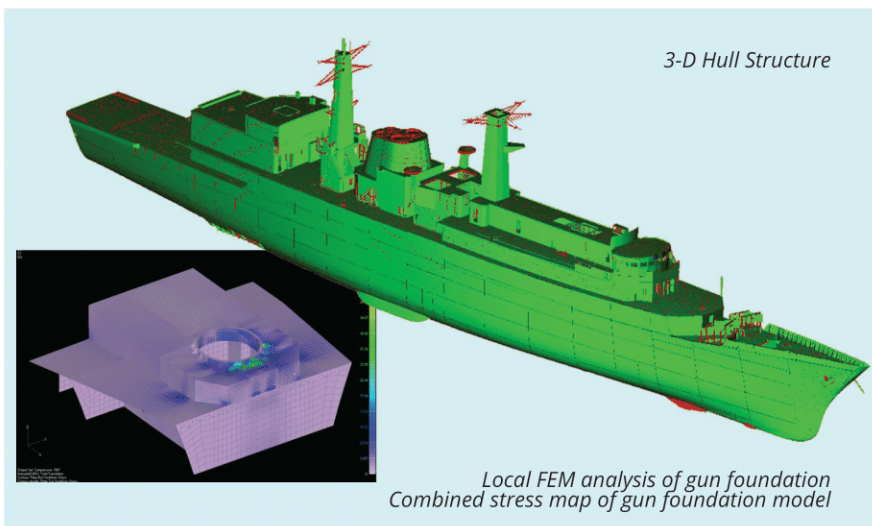
2007 -08

Client/Shipyard: ThyssenKrupp Marine Systems, Germany / Hellenic Shipyard S.A. Greece

ICE Scope of work:

Basic design, steel and aluminium hull drawings and calculation reports for Class approval (GL).

Local static FEA and outfitting arrangements.



3-D Hull Structure

*Local FEM analysis of gun foundation
Combined stress map of gun foundation model*

Ocean Patrol Vessel (OPV) 99m

Royal Navy of Oman (RNO)

2007 -09

Client: VT Shipbuilding , UK

Main contractor at time of commissioning: BVT Surface Fleet Ltd., and BAE Systems, UK.

ICE Scope of Work:

Detail Design for Hull and Outfitting, 3-D model, production info, on-site technical assistance.



Al-Rahmani - Khareef-class Ocean Patrol Vessel (OPV)

Type 45 Destroyer

2000 -01

Royal Navy

Clients: BAE Systems, UK &

VT Shipbuilding, UK

ICE Scope of Work:

Detail design for several hull units.

The work was performed in ICE's project office in Wallsend, England.



HMS Duncan - Type 45 Destroyer



F-111 Mărășești Frigate

Frigate "Marasesti"

Romanian Navy

Shipyard: Mangalia Shipyard SA ,
Romania

Ship Delivery: 1985

ICE Scope of Work:

All design stages and towing tank tests.

Gunboat / Patrol Vessel (P266 - P269)

2001 -04

Hellenic Navy

Shipyard: Hellenic Shipyards SA, Greece (a subsidiary of ThyssenKrupp, Germany)

ICE Scope of Work:

Basic design electrical - AutoCAD;

Detail design for complete ship - Tribon;

Global 3-D FEM Analysis - Hull Deflection / Distortion;

Shipyard assistance and follow-up.



P268 Aittitos Αήττητος - Patrol Vessel



Regina Maria F-222 - Type 22 Class Frigate



Cpt.Cdor.Alexandru Cătuneanu - Maritime Hydrographic Vessel



Contraamiral Eustatiu Sebastian F-264 - Tetral II Class Corvette



F-274 Minelayer



Lt. Lupu Dinescu - Minesweeper

ICE GROUP CAPABILITIES AND RESOURCES

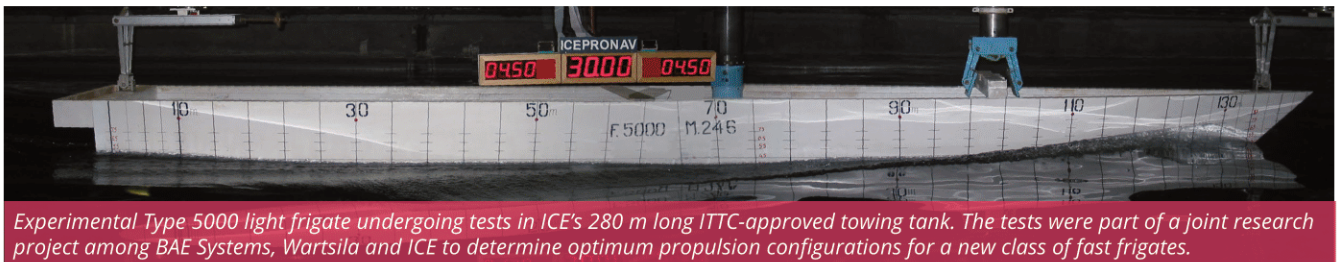
ICE is behind the basic and detail design and tank testing of the majority of the ships for the Romanian Navy including torpedo boats, patrol boats, missile patrol vessels and minesweepers. ICE's UK subsidiary participated in the joint "NATO frigate" development programme and more recently in the new air defence Type 45 destroyers for the UK's Royal Navy as well as in the two new Queen Elizabeth Class Aircraft Carriers. ICE has also done basic and detail design for Offshore Patrol Vessels (OPVs) for the Middle East and the Americas as well as basic design assistance for a series of vessels for the US Navy. ICE executives have personal experience from managing design, construction and refit of many naval vessels ranging from submarines to helicopter carriers.



ICE Main Design Office



ICE Design Office - Typical Project Room



Experimental Type 5000 light frigate undergoing tests in ICE's 280 m long ITTC-approved towing tank. The tests were part of a joint research project among BAE Systems, Wartsila and ICE to determine optimum propulsion configurations for a new class of fast frigates.



ENGINEERING CERTAINTY

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With a 55-year track record and an annual output having exceeded 700,000 professional engineering man-hours, the International Contract Engineering (ICE) Group is Europe's largest independent ship design consultancy. We provide high-calibre multi-discipline design services to yards and owners in the commercial shipping, defence and offshore energy industries, ranging from conceptual studies and Class drawings to detail design and production information. We cover a full range of naval architecture and marine engineering disciplines such as hydrodynamics, structural, mechanical, piping, electrical, instrumentation, outfit and HVAC. Our experience includes gas carriers, passenger vessels, navy and coast guard ships, chemical tankers, drill ships, FSO/FPSOs and a range of other vessels. We also have available proprietary designs that can be adapted to clients' requirements.

With our head office in the Isle of Man and engineering facilities in Romania and Croatia, we provide high quality design and engineering at very competitive prices.