



What Price an Ice Patrol Ship?

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Agenda

Icebreaker ☺



1. Queen Elizabeth Class – Global Combat Ship Workload Gap
2. Ice Patrol Ship History
3. 1990 Endurance Replacement
4. 2010-11 BAE Study
5. Questions



QEC – GCS Gap: Consequences

BAE Systems is to cut 1,775 jobs at its yards in Scotland and England and end shipbuilding altogether at Portsmouth

Three new ocean-going offshore patrol vessels for the Royal Navy will also be built at BAE's Govan and Scotstoun yards in Glasgow.



Hansard: The cost of the contract for the three offshore patrol vessels, including initial spares and support, is expected to be £348 million. A unit cost for these vessels has not yet been calculated.



HMS Endurance Flood



In December 2008, while on an 18-month deployment, *Endurance* suffered extensive flooding to her machinery spaces and lower accommodation decks deck. The Royal Navy inquiry found that the flood happened while a sea water strainer was being cleaned, in an attempt to improve the production of fresh water. The air lines controlling a hull valve were incorrectly reconnected, resulting in the valve opening and an inability to close it.

It was announced on:25 March 2011 that HMS Endurance is to be replaced; 7 October 2013 that *Endurance* will be sold for scrap





Ice Patrol Ship History



HMS Protector 1936-1968



HMS Protector Netlayer

1936 – 1954

Conversion in Devonport to Falkland
island Guardship/ Antarctic Patrol Ship

1955 - 1968





HMS Endurance 1956 - 1992



Anita Dan 2,900 tons

Conversion in Harland & Wolff

HMS Endurance 3,600 tons

1968 - 1992





1990 Endurance Replacement Study

- 1990 – Concept Design
- Costed as £52M using Landing Ship Logistic [Replacement] Sir Galahad parametrics.
- Budget had been £40M, cut to £25M a few years previously.
- MoD MB critical. Natural Environment Research Council vessel £37M - price not cost!!



1991 RRS James Clark Ross

The Survey developed a Statement of Requirements which brought together the scientific, logistic and ice breaking requirements into a single document. Previously they had selected consultants to develop this into a specification suitable for shipbuilders to tender against. The tendering consultants were also asked to provide an estimate of the cost to build the vessel: five submissions were received, all produced estimates in the region of £20 million. A consultant was duly appointed. When the build tenders were received they were in the range £37 million to £45 million. The funding gap necessitated a submission for increased funding, which was considerably delayed in being granted. The ship was built at Swan Hunter Shipyard at Newcastle.



- the replacement of the oldest of the Survey's two supply/science ships, the RRS *John Biscoe*. The RRS *James Clark Ross* was delivered to the Survey in 1991 for proving trials at a total cost of £42.6 million at 1992-93 prices, of which some £6 million was funded from elsewhere in

£37½M + £17M at 1990 ECs is
£96M at 2012 ECs.

FT 20 JUL 94 / Time to play the very last song
Needing work, Swans took the contract for the James Clark Ross, a British Antarctic Survey ship. A technological triumph, it was a financial disaster, losing Pounds 17m in 1991 and wiping out the reserves. This meant Swans could not obtain underwriting for the performance bonds required by the MoD, and consequently could not tender on its own for the MoD helicopter carrier order then vital to its survival.



HMS Polar Circle/ Endurance



My Lords, the Government announced on 14th October (1991) that MV "Polar Circle" had been chartered to replace HMS "Endurance" in the Antarctic this season. "Endurance" is no longer fit to deploy in Antarctic water; and is to be decommissioned.

Gross Tonnage 5129
Displacement 6,500 Te
DWT 2,500 Te

Rieber are ready to sell the *Polar Circle* at around £25 million as the charter market has not developed as expected since her delivery, especially for such a ship at the upper end of the charter market; there has also been a change of business strategy within the company.



Ice Patrol Ship Tasks

- To provide a UK Sovereign presence in the British Antarctic Territory, South Georgia and the South Sandwich Islands and their surrounding maritime areas, to underpin their security and good governance; and meet the UK treaty obligations and exercise rights under the Antarctic Treaty System through inspections, hydrographic charting and support to scientific research

Public Domain - Icebreakers



Public Domain – Ice Capable Ships






Class Notations : Ice

- Variety of Ice Notations by Classification Societies

DNV Rules and other requirements - Hull

MANAGING RISK 

DNV Class Notations	Equivalent Baltic Ice class	Vessel Type	Ice Conditions	Impact Limits
ICE-C			Very light ice condition	
ICE-1C	1C		- First year ice and broken channel	
ICE-1B	1B			
ICE-1A	1A			
ICE-1A*	1A Sup			
ICE-1A**				
ICE-05				
ICE-10				
ICE-15				
POLAR-10				
POLAR-20				
POLAR-30				
ICEBREAKER				

Ship	Country	Rating	DNV Equivalent
RRV James Clark Ross	UK	LR ICE-1AS	ICE-03
Nathaniel B Palmer	USA	ABS Ice Class A2	ICE-10
Laurence M Gould	USA	ABS Ice Class A1	ICE-03
Varandey	Singapore	KM LL7 2A1	POLAR-20
RV Araon	Korea	KR PL-10	POLAR-10

Version



Cost Data Quality

Vessel	Owner	Country of Build	Role	Ice Classification	Comment	Quality Rank	Summary
KV Svalbard	Norwegian Coast Guard	Norway	Coast Guard Vessel/ Icebreaker	DNV Polar 10 Icebreaker	Shipbuild & total price	1	Yes
Varanday	LUKOIL – Kaliningradmorneft	Singapore	multi-purpose ice-breaker	RMG KM LL7 2 A1 Icebreaker	Shipbuild price	2	Yes
Toboy	LUKOIL – Kaliningradmorneft	Singapore	auxiliary ice-breaking tug	RMG KM LL7 2 A1 Icebreaker	Shipbuild price	2	Yes
SA Argulhas II	South African Government	Finland	polar supply and research vessel	DNV 1A1 Polar Class -5	Shipbuild price	1	Yes
ARRV Sikuliaq	US National Science Foundation	USA	Ice capable research ship	IACS PC-5	Shipbuild & total price	1	Yes
USS Mackinaw	US Coast Guard	USA	icebreaker/buoy tender	Not in Class - Icebreaker	Shipbuild price	2	

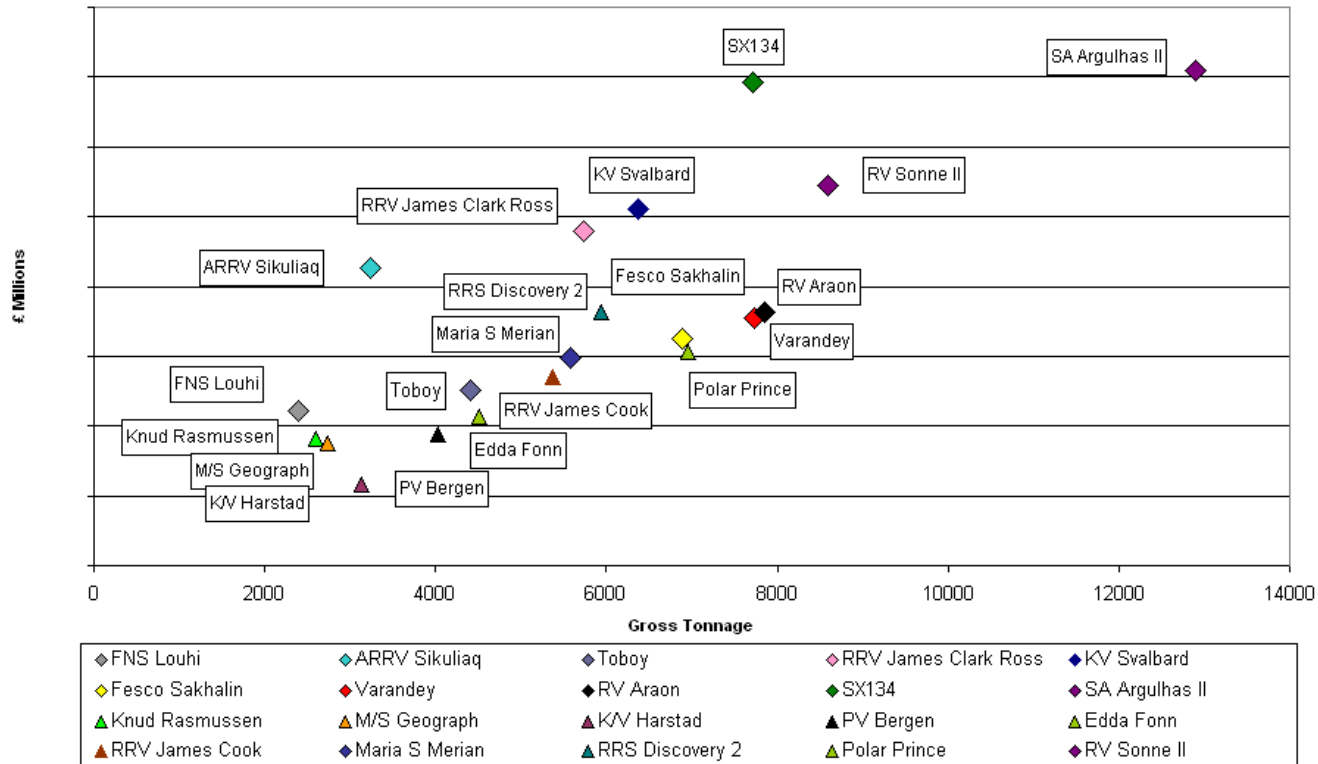
Ranking:

- 1. Government/ Customer report.**
- 2 Customer/ Contractor Press Release/ Statement**
- 3. Industry Publication (Janes/ Orderbook for Norwegian Shipyards)**
- 4. Press/ Internet report**



Size v Cost

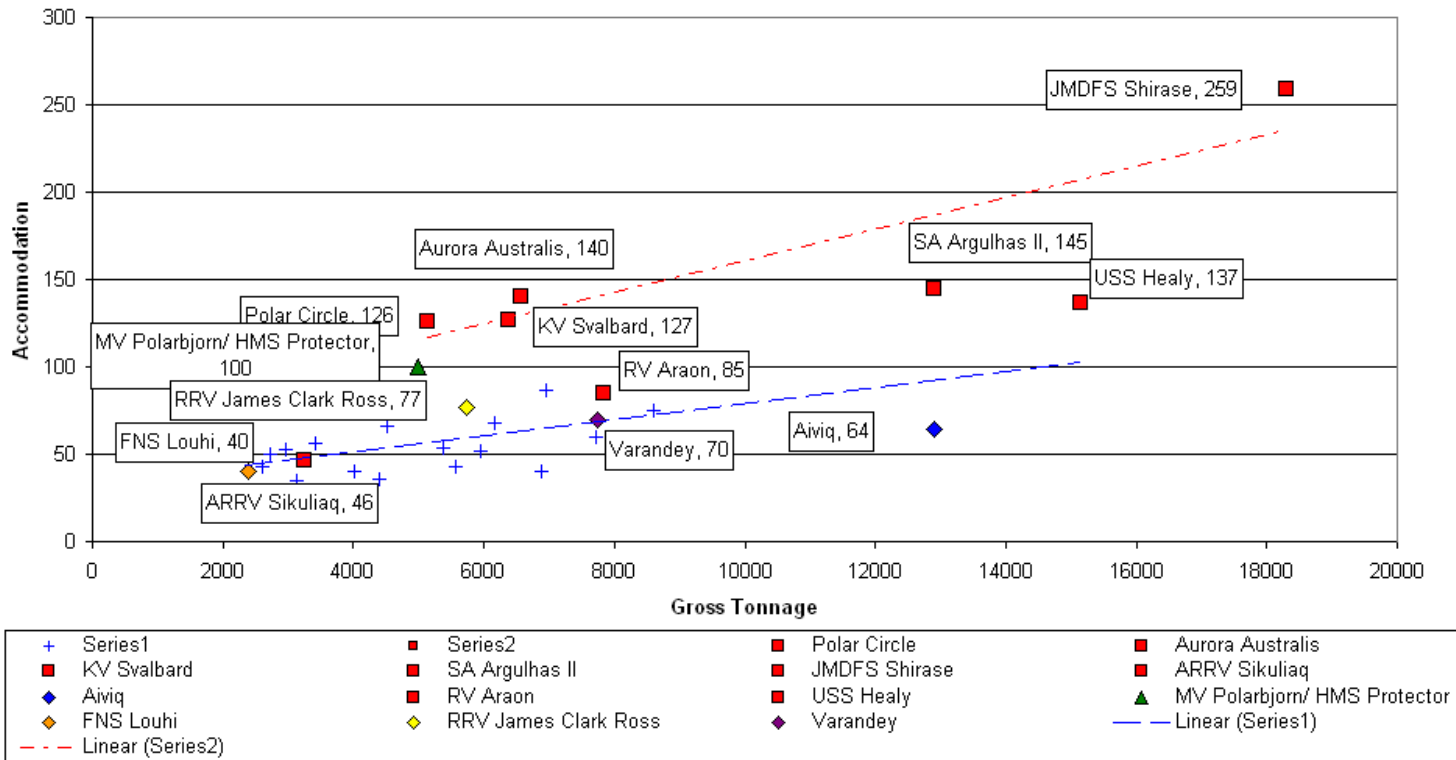
Cost @ 2012 ECs v Gross Tonnage





Numbers v Size

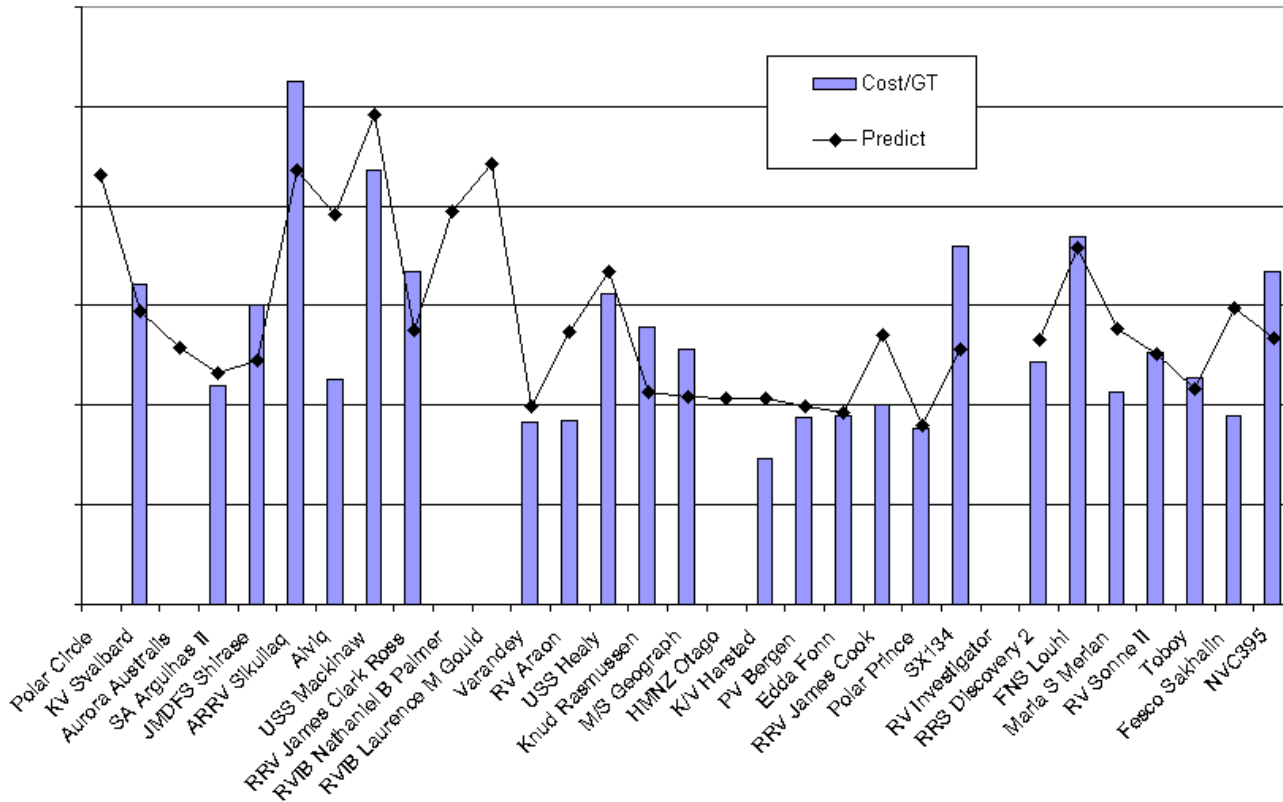
Correlation of Berths with Gross Tonnage





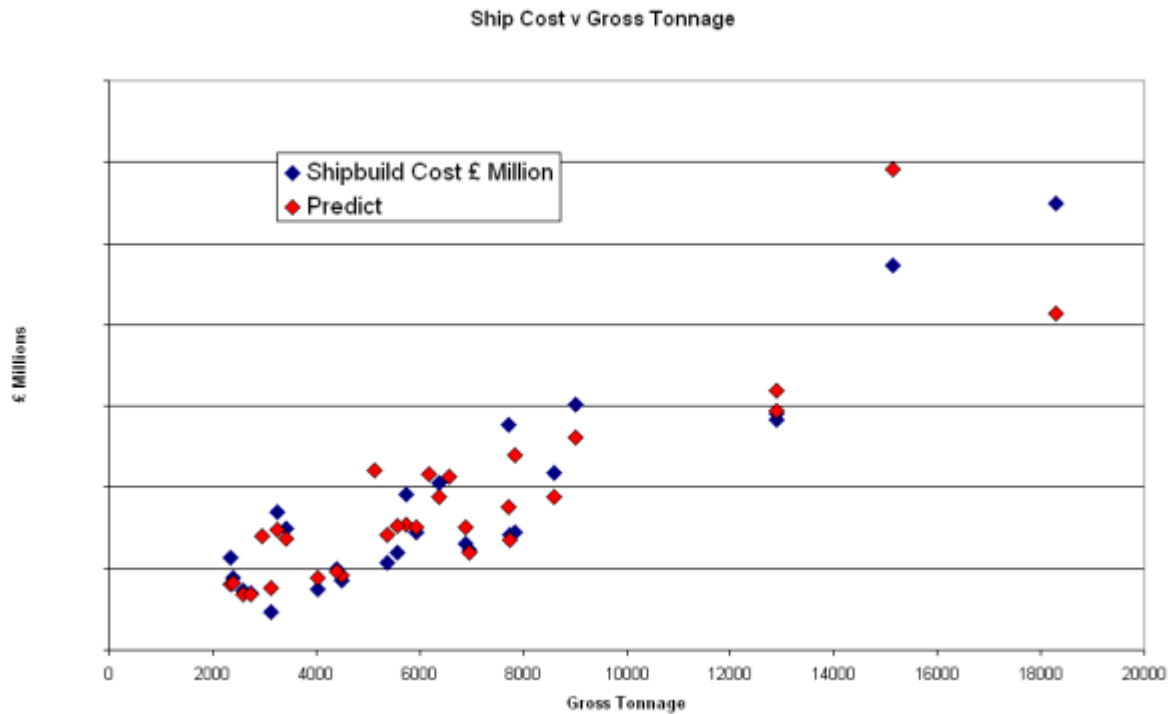
Ice Ships Plot

Specific Cost £K/GT





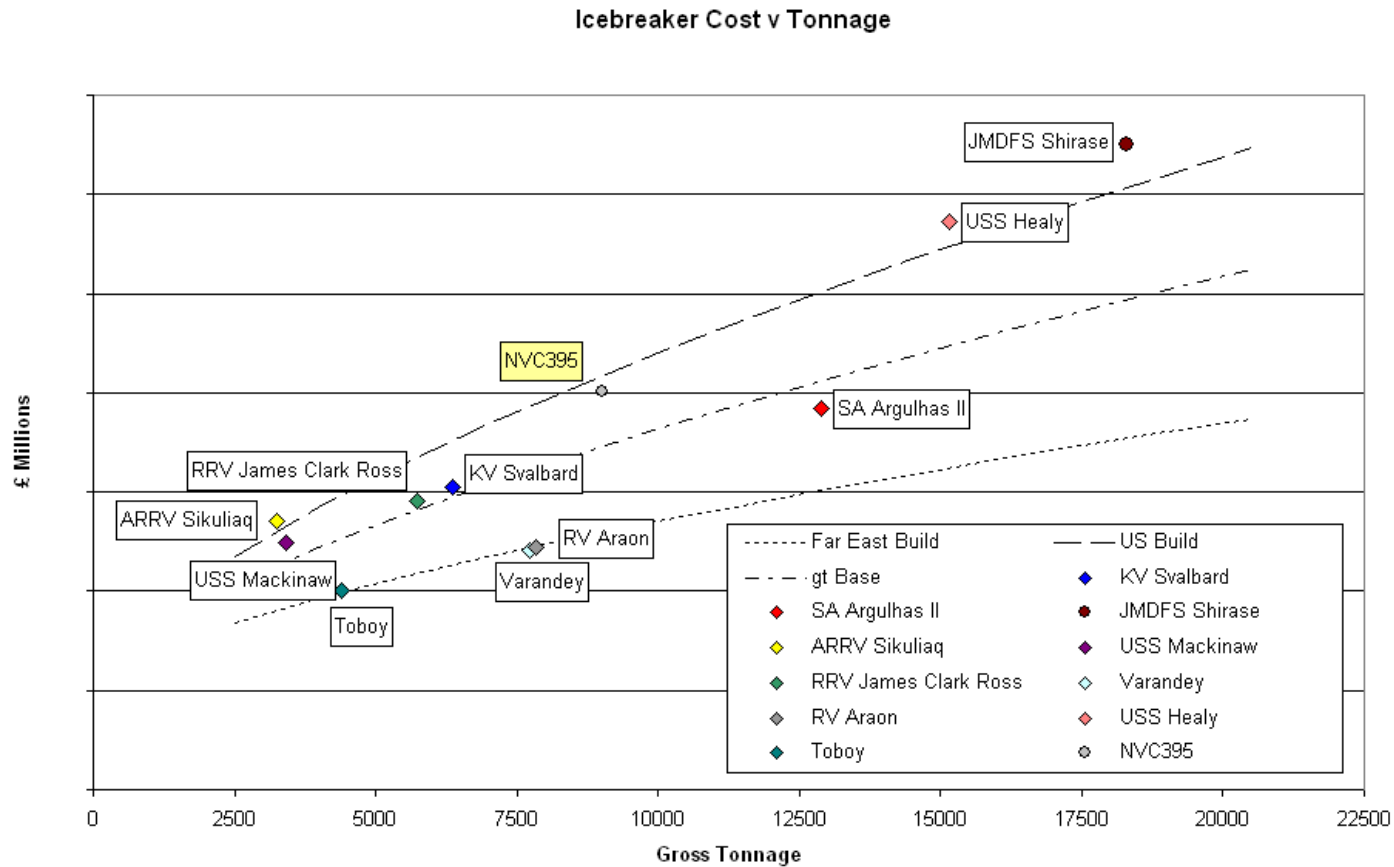
Cost v Prediction



- Note that fit is good at sizes of interest but divergent at higher sizes



Simplistic Plot of Icebreakers





HMS Protector Timeline





HMS Protector Costs

- HMS Protector (2001 Polarbjørn)
- 4985 GT

BAS Statement:

HMS Endurance is the Royal Navy's ice patrol ship. She patrols Antarctic waters carrying out operational duties for the Foreign and Commonwealth Office and UK Hydrographic Office as well as providing science logistics support to BAS.

Two Lynx helicopters onboard enable BAS scientists and support staff to get to remote field sites that BAS aircraft can't access around the British Antarctic Territory and South Georgia.

•(plus conversion to hangar helos?)

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list
ent
torboat.
plus £3M

Questions?

