Dream, Reality and Some Aspects of Arctic Shipping Concern in Japan

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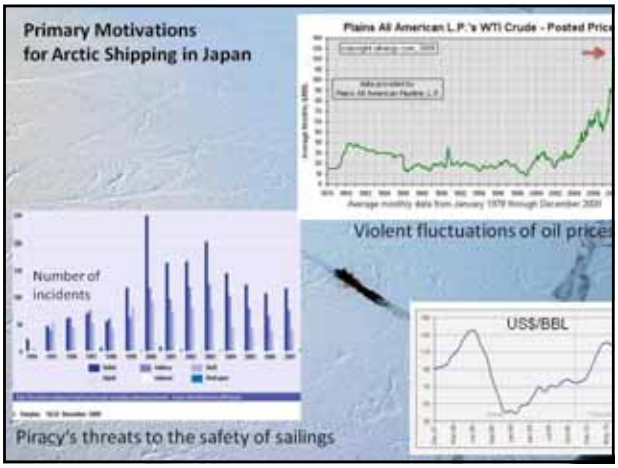
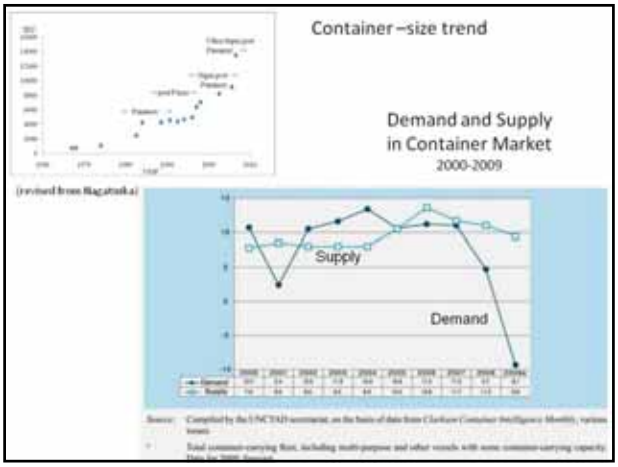
2010 NTNU Japan Seminar
Trondheim, 16 March, 2010

OPRF





OPRF's Periodical Journal, and Journals and Magazines carried the articles on Arctic shipping

Quarterly Journal on Arctic Issues: Ocean Policy Research Foundation

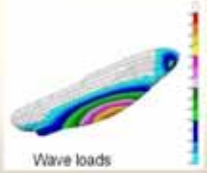
Japan Captains' Association

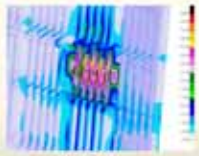
The Ports and Harbours Association of Japan

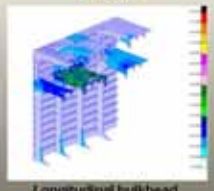
Weathernews INC's Global Ice Center on the Shirase (retired)

High Potential of Japan Industry for Energy Development and Shipping in the High North

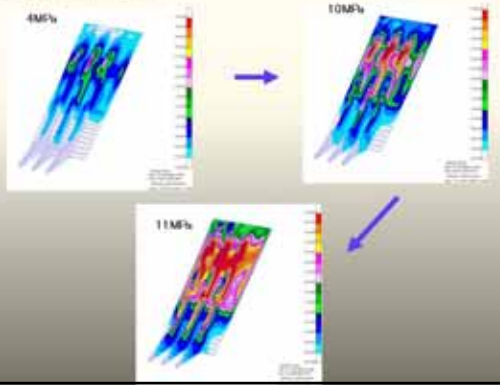
Elastic-plastic response analyses of an icebreaking ship hull, against wave loads and ice loads:Such analyses are quite common among ship designers.



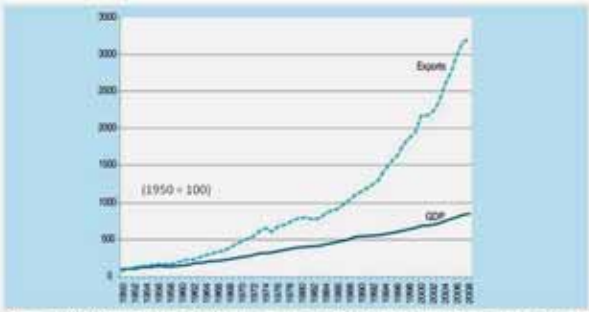




Accelerating plastic behaviours of a hull due to increase of ice load ; an example

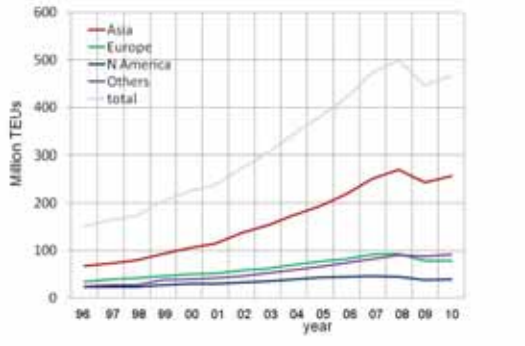


GDP and Exports



Source: UNCTAD, based on World Trade Organization, Table A1, Trade Statistics, 2008. Trade volumes data are derived from customs values deflated by standard unit values and adjusted price index for electronic goods.

Regional Developments of Container Throughputs at Ports

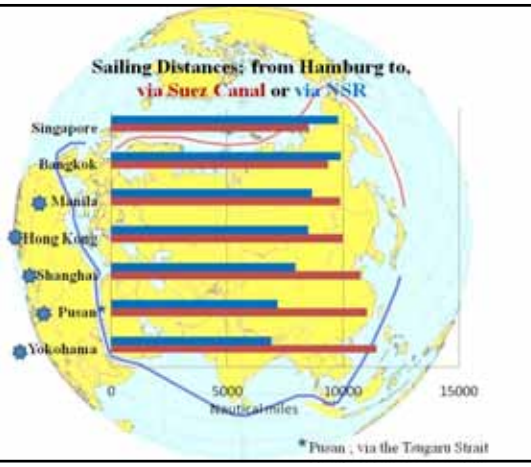


(after Container Intelligence Monthly, Nov. 2009)

The Top 30 Ports in the World in Container Throughputs in 2007; 1,000TEUs

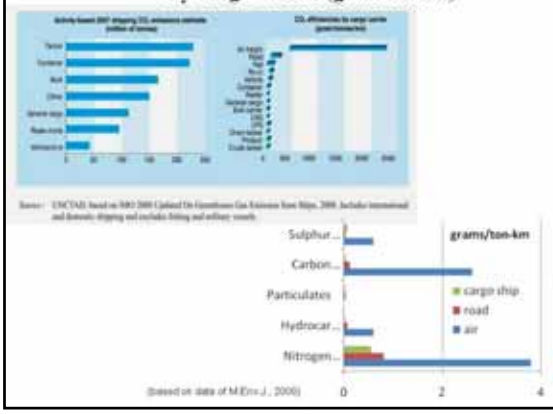
(MLITT J, 2009)

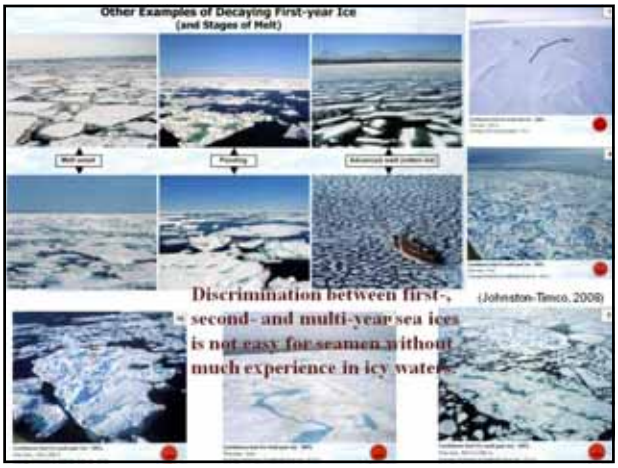
Sailing Distances: from Hamburg to, via Suez Canal or via NSR



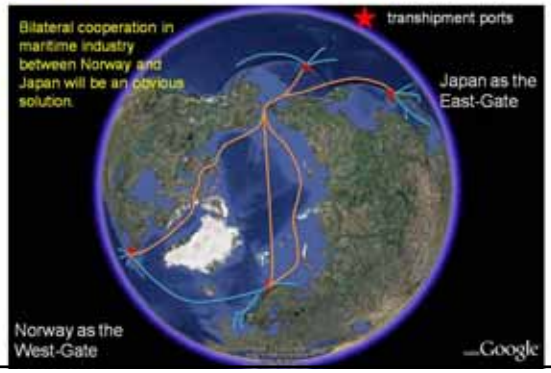
*Pusan ; via the Tsugaru Strait

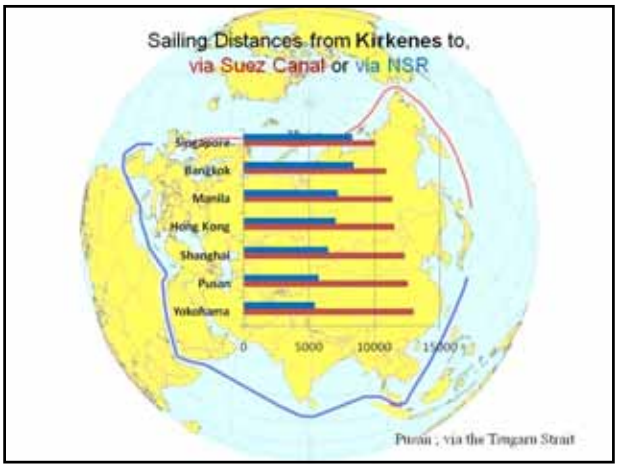
Shipping Sector CO_2 Emission and CO_2 Efficiencies By Cargo Carrier (gram/ton/km)

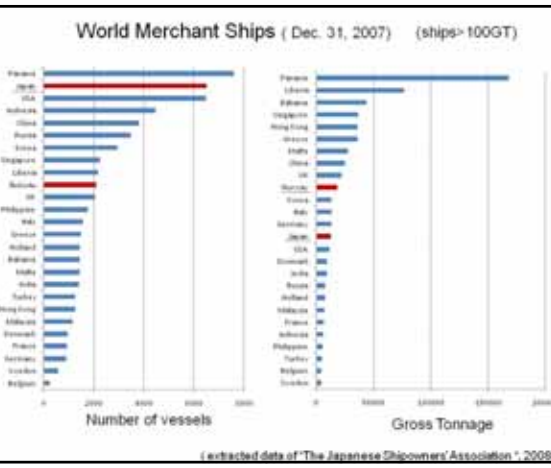


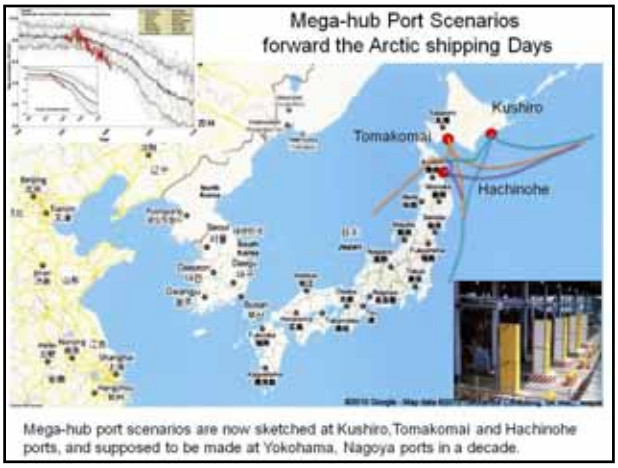


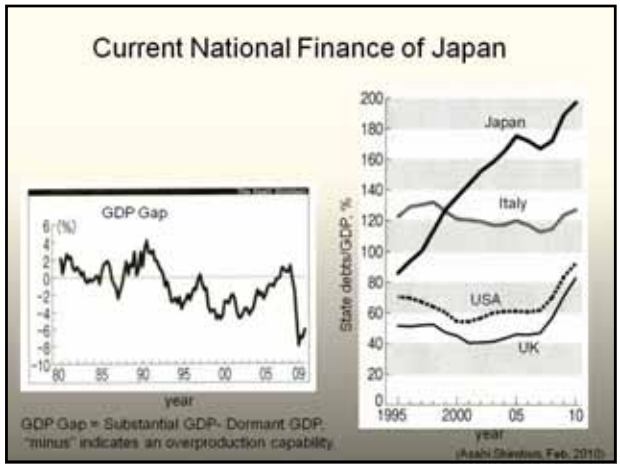
The Arctic Shipment should be carried out by alliances or consortia, with environmentally safe and reliable vessels and certificated and/or well-trained crew.

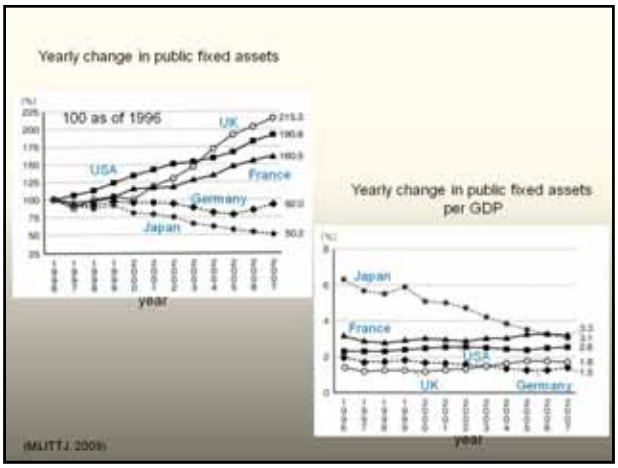


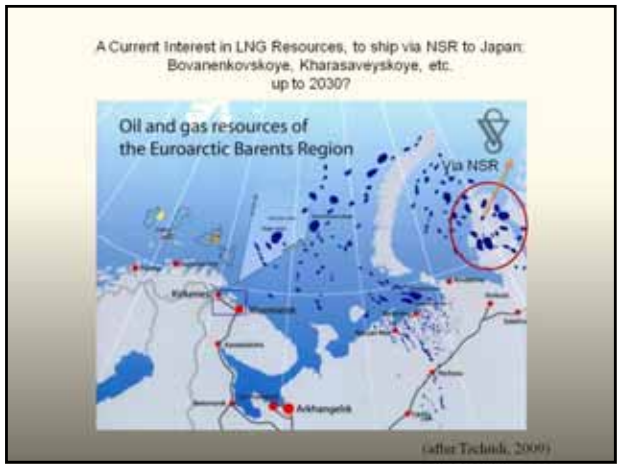





Mega-hub Port Scenarios
forward the Arctic shipping Days
Kushiro
Tomakomai
Hachinohe
Mega-hub port scenarios are now sketched at Kushiro,Tomakomai and Hachinohe ports, and supposed to be made at Yokohama, Nagoya ports in a decade.


Current National Finance of Japan
GDP Gap
year
GDP Gap = Substantial GDP- Dormant GDP;
"minus" indicates an overproduction capability
Japan
Italy
USA
UK
State debts/GDP, %
year
(Asahi Shimbun, Feb. 2010)


Yearly change in public fixed assets
100 as of 1996
UK
USA
France
Germany
Japan
year
Yearly change in public fixed assets per GDP
Japan
France
USA
UK
Germany
year
(MLITTJ 2008)


A Current Interest in LNG Resources, to ship via NSR to Japan:
Bovanenkovskoye, Kharasaveyskoye, etc.
up to 2030?
Oil and gas resources of
the Euroarctic Barents Region
Via NSR
Arkhangelsk
(after Technip, 2009)

In some days in future when melting of sea ice goes beyond the NSR's rim, we would be able to fully enjoy the Arctic shipping, except for the SAR issues and the deep anxiety about our globe in consequence of the climate change.

(MachiaN,00)

Save the Arctic Ocean through a bilateral cooperation of Norway and Japan !

OPRF

numerous data added onto "Atlas of the Oceans, Times Book in 1983")

MHI develops new generation MOSS type LNG Carrier

Mitsubishi Heavy Industries, Ltd. (MHI) has developed a new generation MOSS type LNG carrier nicknamed SAYAENDO (literally means "peas in a pod") LNGC, which has obtained AIP (Approval in Principal) from DNV, LR, and NK.

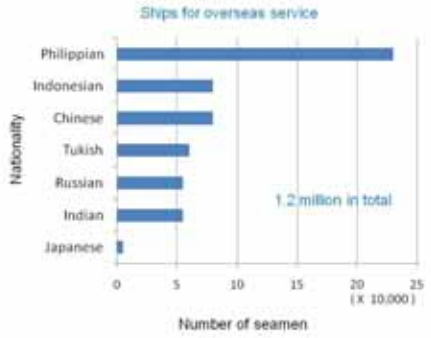
In contrast to the conventional MOSS type LNGC, SAYAENDO LNGC has a continuous tank cover in place of the conventional independent ones for the spherical aluminum alloy tanks. This innovative feature contributes to reducing the hull steel weight by about 10%, improved fuel consumption, higher terminal compatibility, and less maintenance.

The structural design is more effective than the conventional LNGC since the tank cover is utilized as the ship's longitudinal strength member. This structural optimization enables the SAYAENDO LNGC to be more compact and use steel materials effectively.

SAYAENDO LNGC can also attain higher compatibility with LNG terminals in the world through its compact dimensions and better maintainability because the flying passage supporting structures can be eliminated.

Furthermore, SAYAENDO LNGC has realized reduction of fuel consumption by more than 20% in combination with the higher efficiency propulsion system called "MHI UST (Ultra Steam Turbine)" compared with the conventional steam turbine plant. Therefore, the SAYAENDO LNGC is a more environmentally friendly LNGC design.

Summary of
SAYAENDO 165LNGC
Lo.a.) x B x D x ddldc abt. 298m x 50.4m x 25.0m x 11.5m/12.5m
Cargo tanks capacity: abt. 165,000m³
Main engine: Mitsubishi UST x 1 set
Designed ship speed: abt. 19.5kt



(data :MLITTJ, 2008)

Environmentally Friendly Car-Carrier, "Ishin" (image)

(MOL, 2010)

Korea's Activities on Arctic Shipping Issues

in education

in building icebreaking vessels

in research and development

KORDI

MOERI Ice Tank