

The Finnish Draught System

PIANC AGA 2009

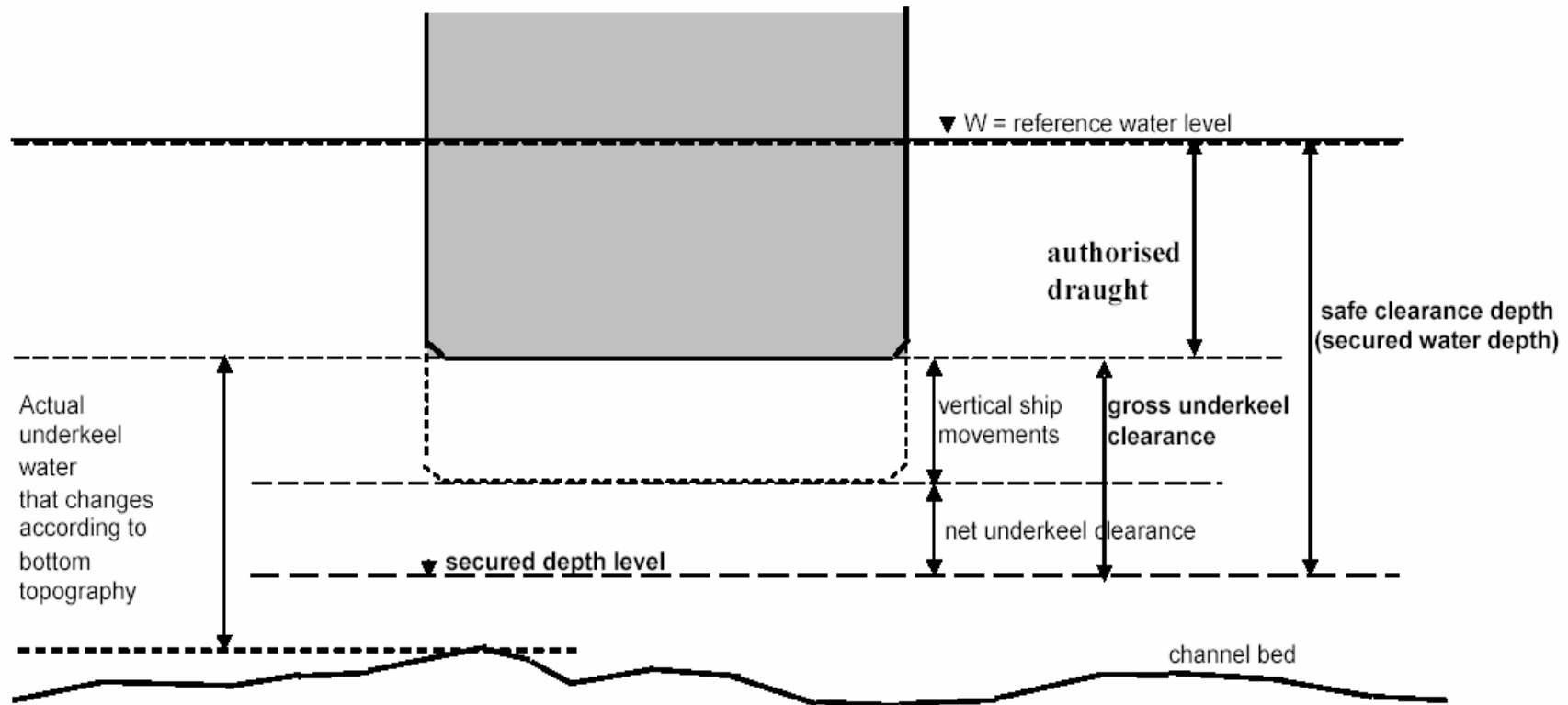
Helsinki

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**Finnish Maritime
Administration**

Draught concepts associated with channels



Authorized draught

- **The authorized draught of a channel refers to the maximum design draught at which a ship normally can use the channel. The authorized draught is determined from the reference level.**
- The authorized draught does not mean that any ship in any circumstances and conditions could use the channel without risk of touching bottom, even if her draught, taking the water level into consideration, does not exceed the draught of the channel.
- The draught of a public channel is confirmed by the Decision of the Finnish Maritime Administration. The authorized draught is shown on the nautical chart as a figure on the navigation line.

Recommended draught

- In certain shipping lanes on the coast, which have been declared pilotage areas, the authorized draught can be interpreted as a guideline (recommended draught). This means that the ship may, in certain circumstances and taking the conditions, ship properties, speed and channel data into consideration also use the channel when her draught exceeds the authorized draught.
- Attention should be paid on the following circumstances
 - Weather and wind conditions
 - Ship characteristics and speed
 - Gross underkeel clearance
 - Current water level

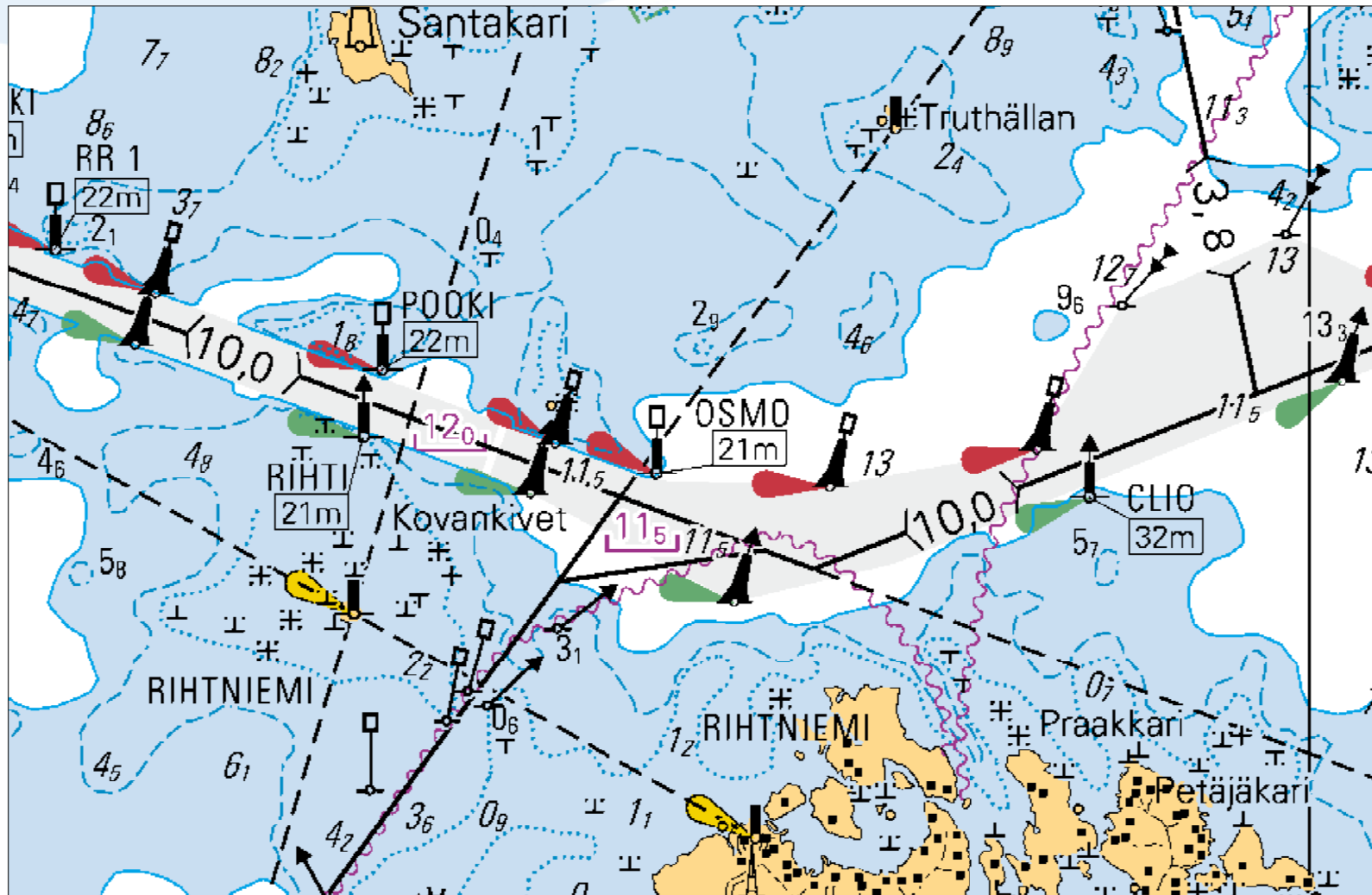
Reasons for the decision

- **Vertical ship movements are estimated according to more severe than normal conditions in the design stage, so the gross underkeel clearance is oversized in normal or mild conditions**
- **Squat is estimated by Huuska-Icorels formula, which appears to exaggerate the squat values**
- **Oversized underkeel clearance potential can be safely utilized in mild conditions by reducing the vessels speed (and squat) and correspondingly using bigger draught**
- **By average 0,3 m additional draught the savings in transporting expences would be about 3,5..7 M€ annually in Finland (Finnish foreign trade)**

Publications

- **On nautical charts, channel depth is shown on the navigation line by a figure indicating the authorized draught.**
- **With relation to the channels applied to the recommended draught also the safe clearance depth (secured water depth) of the fairway is represented on coastal charts.**
- **Authorized draught and safe clearance depth and their changeover points are also indicated on so called fairway cards, which include general information about the channel and the harbor.**
The dimensions of the design ship and the design speed are also represented on fairway cards.
- **Finnish Maritime Administration has also published a bulletin (8/12.7.2005) about the channel depth practice in Finland (www.fma.fi)**
- **A program (based on Huuska-Icorels formula) for calculating the squat is also available on the web site**

Nautical chart



Fairway Card

FAIRWAY CARD

15.6.2005

RAUMA CHANNEL (10.0 M)

CHANNEL DATA

Alignment and buoyage: V of Rauma Lighthouse – port. Four leading lines. Length approx. 26 km/14 nautical miles. Lateral marks. Lit.

Dimensions: Design ship: Ro-Ro ship, L = 210 m, B = 30 m, T = 10.0 m. Maximum authorised draught 10.0 m, safe clearance depth (MW95) in the outer channel -12.0 m, in the inner channel -11.5 m. Minimum width 120 m, in the passage of Kovankivet 160 m; minimum bend radius 1000 m; design speed in dredged passages 12 knots.

Anchorage and other special areas: In the outer channel, anchorage W of Rauma Lighthouse; beware of cable S of lighthouse. In the inner channel, anchorage and passage either in the widened area N of Rihtniemi or SW of Iso Järviluoto, approx. 1.5 km before arrival into port.

NAVIGABILITY

Navigational conditions: The outer channel to Rihtniemi is unsheltered and open to S-W-N winds. From Rihtniemi on, the channel continues as a narrow and densely marked channel, sheltered by isles, islands and mainland. Cross currents, which make the manoeuvring of large vessels more difficult, may occur when navigating the Urmluoto line in the passage of Kovankivet. Strong side winds also aggravate the side drift.

Ice conditions: In winter ice fields tend to move in the channel, outside Hylkikarta. Ice movement may cause buoys to be pressed beneath the surface and their lighting devices may be damaged.

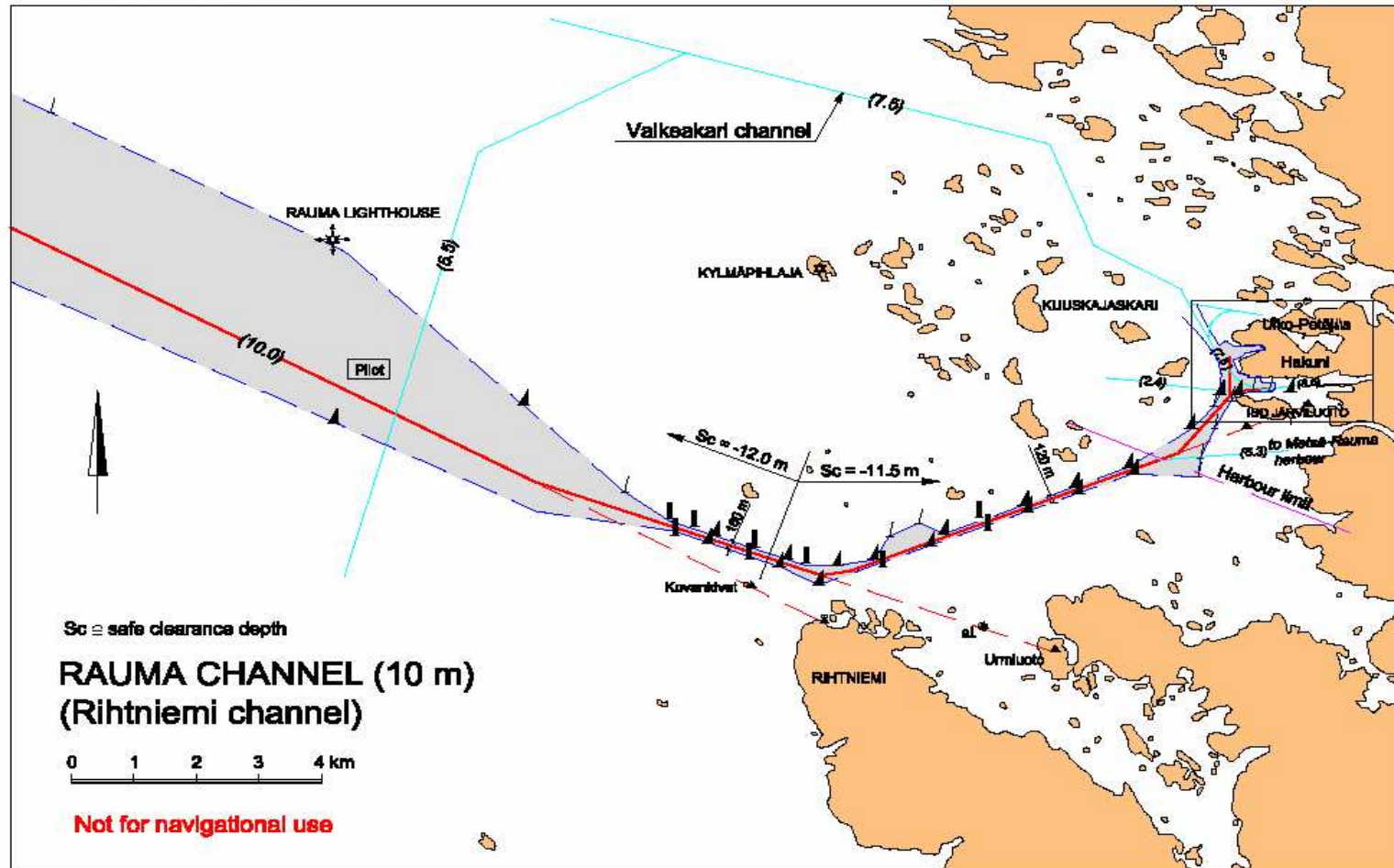
OPERATIONAL RECOMMENDATIONS (channel and harbour)

Wind: Max. speed of drifting wind gusts 18 m/s in daytime and 15 m/s at night. Limits lower for Ro-Ro ships and ships in ballast. Max. wind gusts 11 m/s for ships in ballast, larger than the design ship. Drifting wind means a wind which differs from the Urmluoto line by more than 30°. Pilotage is discontinued when the wind speed exceeds 20 m/s.

Fairway Card/ Fairway drawing



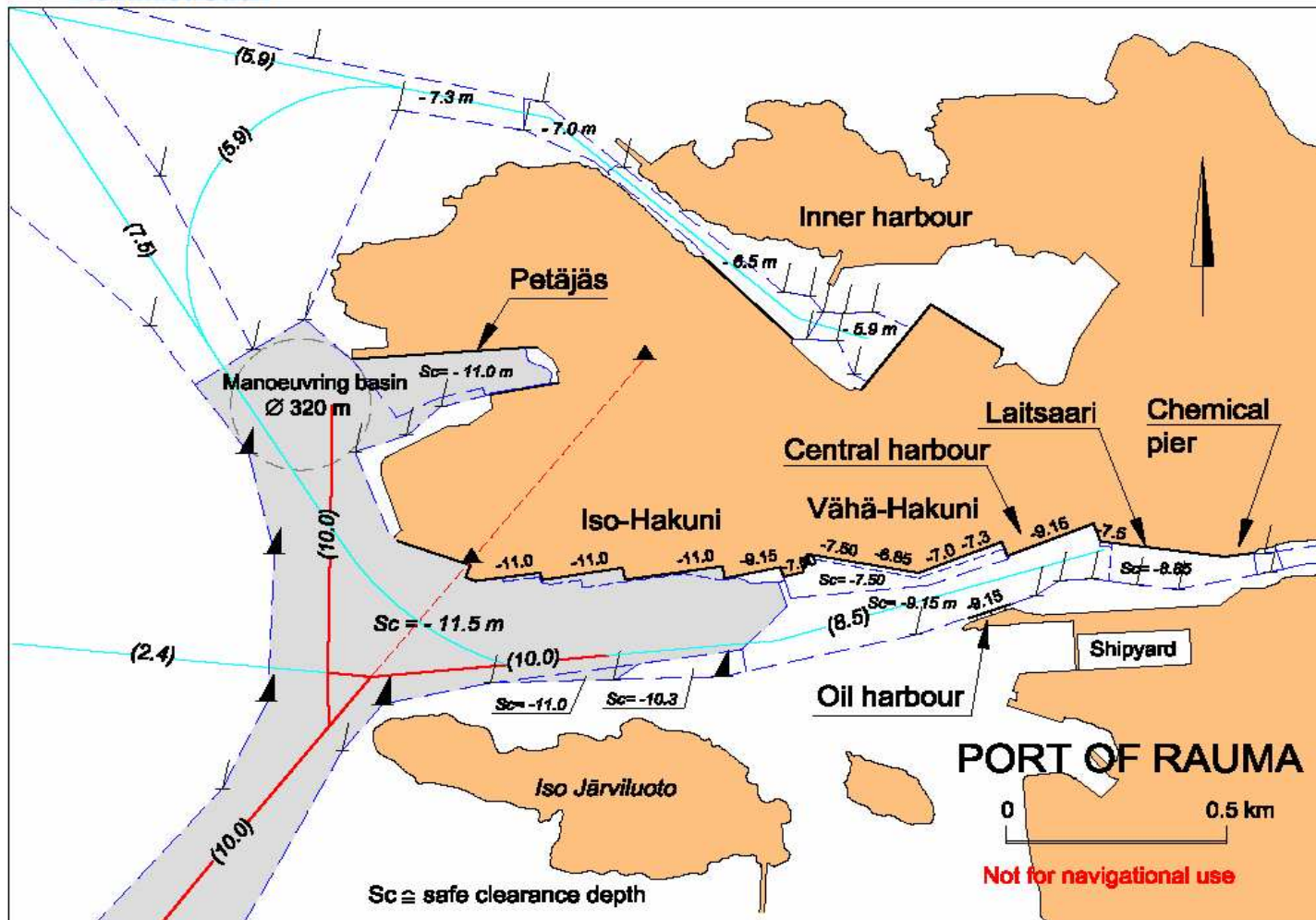
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Fairway Card/ Harbour drawing



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Squat (Huuska-ICorels formula)

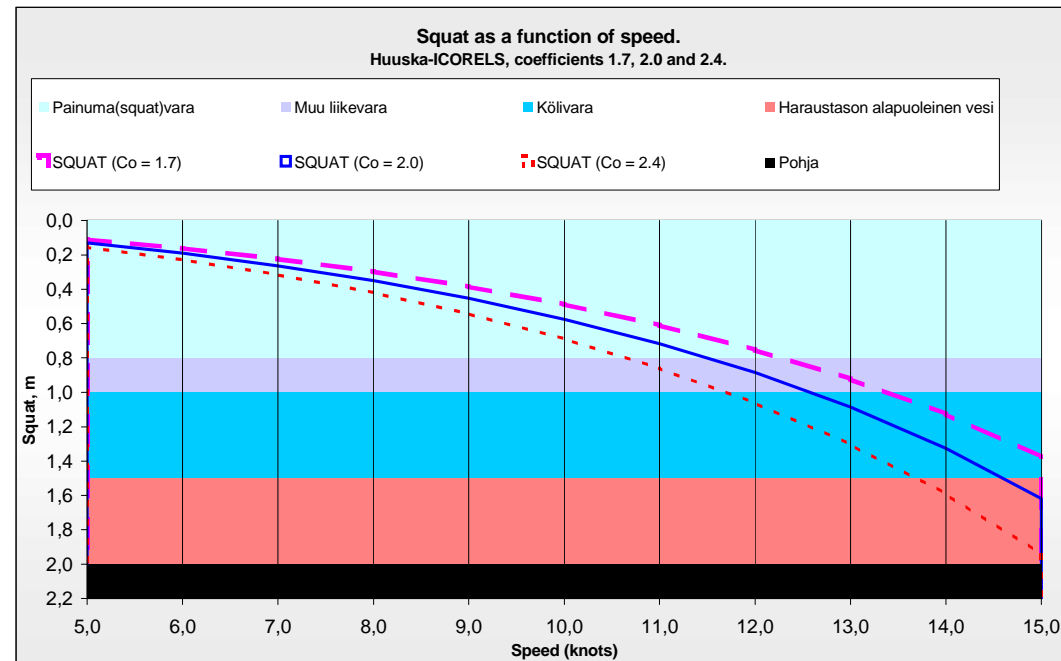
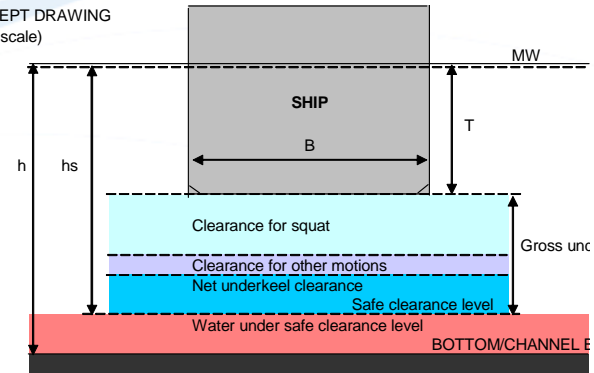
BASIC DATA

Ship's beam (B)	27,0 m
Ship's length (L _{pp})	180,0 m
Block coefficient C _B	0,75
B / L _{pp} =	0,15
Ship's draught (T)	10,0 m
Safe clearance depth (h _s)	11,50 m
Water depth (h)	12,0 m
Gross underkeel clearance	1,5 m
- Net underkeel clearance *	0,5 m
- Clearance for other motions	0,2 m
- Clearance for squat	0,8 m

* Net underkeel clearance for sea channels is normally 0,5 m.

** Clearance for other motions includes ship motions caused by waves, inclinations etc. Must be valued case specifically.

CONCEPT DRAWING (not in scale)



Implementation

- **The new revised practice (recommended draught) has been taken in use in July 2005.**
- **The practice applies fairways for merchant shipping on the coast, which have been declared pilotage areas.**
- **Implementation happens gradually: a fairway will be embraced by the new practice, as all the fairway and depth data along the fairway and in the harbor are checked and verified, and the fairway is indicated on nautical chart according to the new practice.**
- **At the moment the new practice applies to 11 fairways (2009: +, 2010: +, 2011: +)**



**THANK YOU
FOR YOUR
ATTENTION!**

Finnish Maritime Administration/ 31st PIANC
Congress, Estoril, May 2006