MARNIS RISK CONCEPT

FINAL PRESENTATION OF MARNIS

IALA FEB 2009

Objectives of risk considerations

The most important objective is:

- **Improvement of safety and the protection of the environment;**

The following aspects play a role

- o Improvement of efficiency and reliability of information flows;
- o Furtherance of the economy of sea transport;
- o Improvement of the efficiency of legal and organisational aspects regarding enforcing of rules and regulations in the “European maritime zone”

Fundamental equation

$$P(i) = F_{flag} * F_{age} * F_{wind} * F_{vis} * F_{nav} * EXP(i) * CASRAT(i, type, size)$$

P(*i*) = Probability of a certain accident type (*i*)
EXP(*i*) = Exposure for a certain accident type (*i*)
CASRAT (i,*type*,*size*) = Casualty rate for a certain accident type (*i*), ship type and ship size
F_{flag} = multiplication factor for flag state
F_{age} = multiplication factor for age of the ship
F_{wind} = multiplication factor for wind
F_{vis} = multiplication factor for visibility
F_{nav} = multiplication factor for the navigation status

Risk in VTS areas and SRR monitoring areas

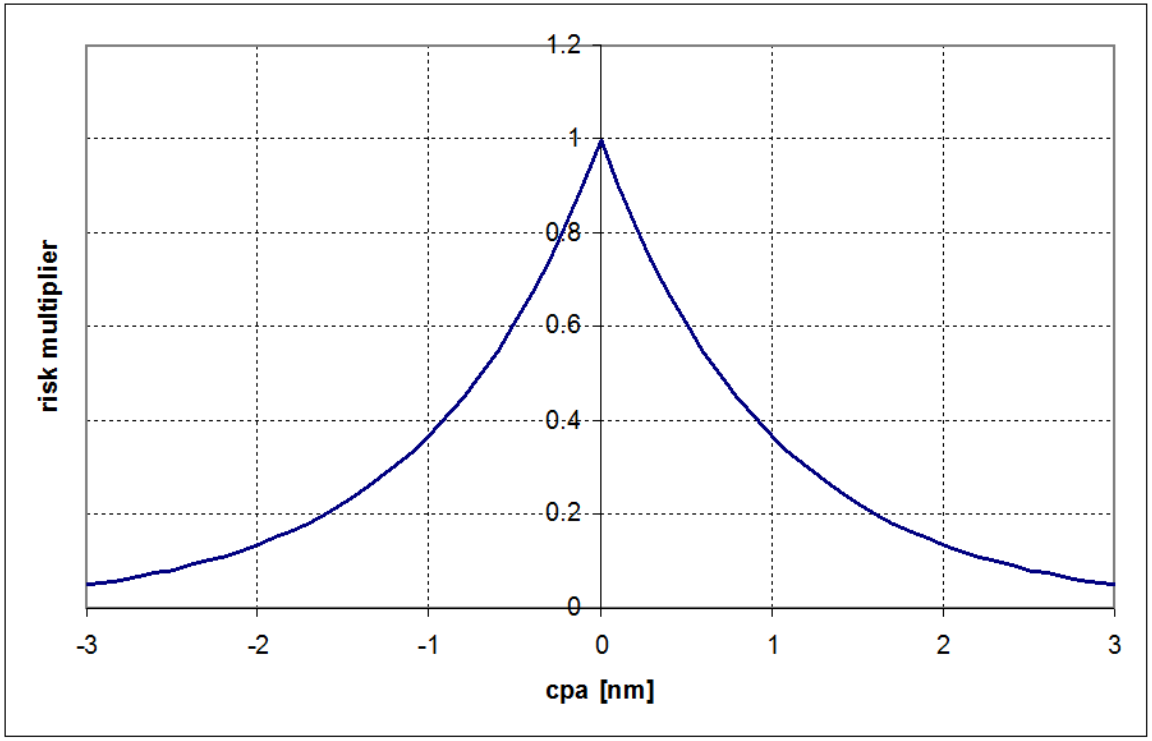
The risk approach can be used:

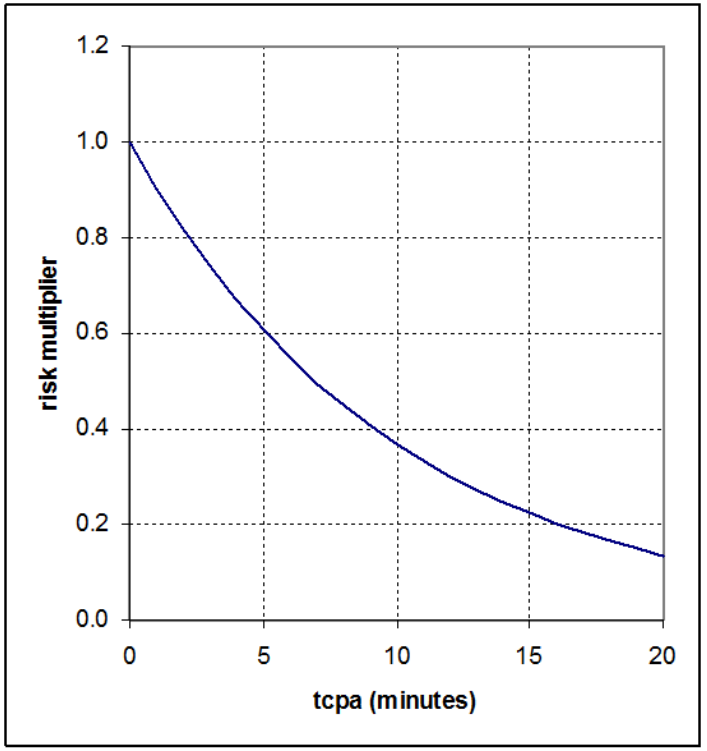
- in a VTS area of the reporting area of a Member State;
- in an area where SRReporting is enabled;
- LRReporting provide a traffic image.

The difference is caused by the presence of other ships which can affect the risk of own ship. When vessels approach each other in a fashion that a “risk of collision” exists the collision risk part of the risk equation may be higher than the threshold and the vessel becomes an Alert Ship. The VTS (MOS) operator may watch the behaviour of the vessels more closely and give information (and instructions as the case may be) to the vessels as required.

The risk approach may also applied for monitoring symptomatic behavior of vessels. In this case the average collision risk in an area is being used that reflects the trend of the risk better.

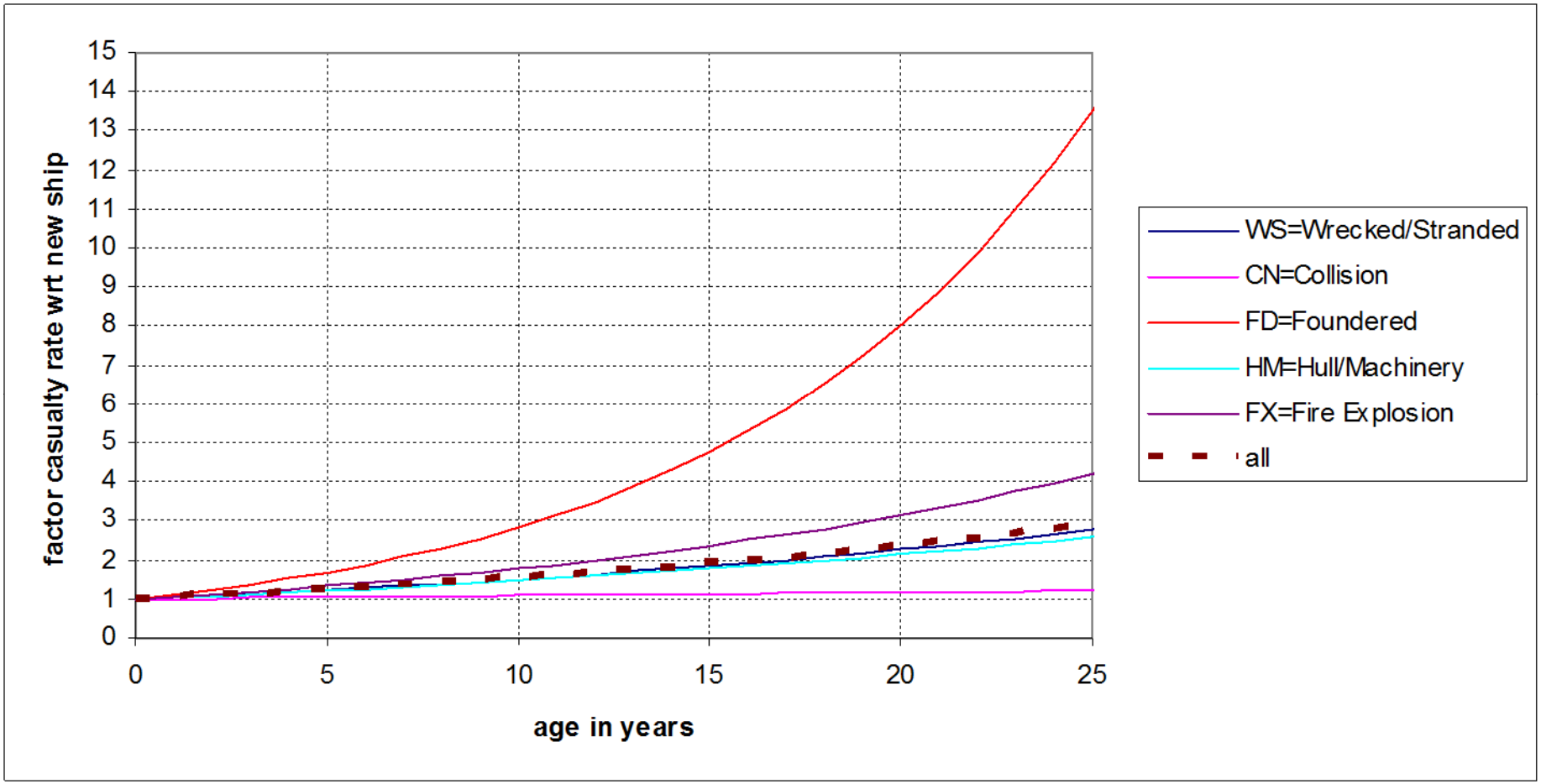
Risks in encounters



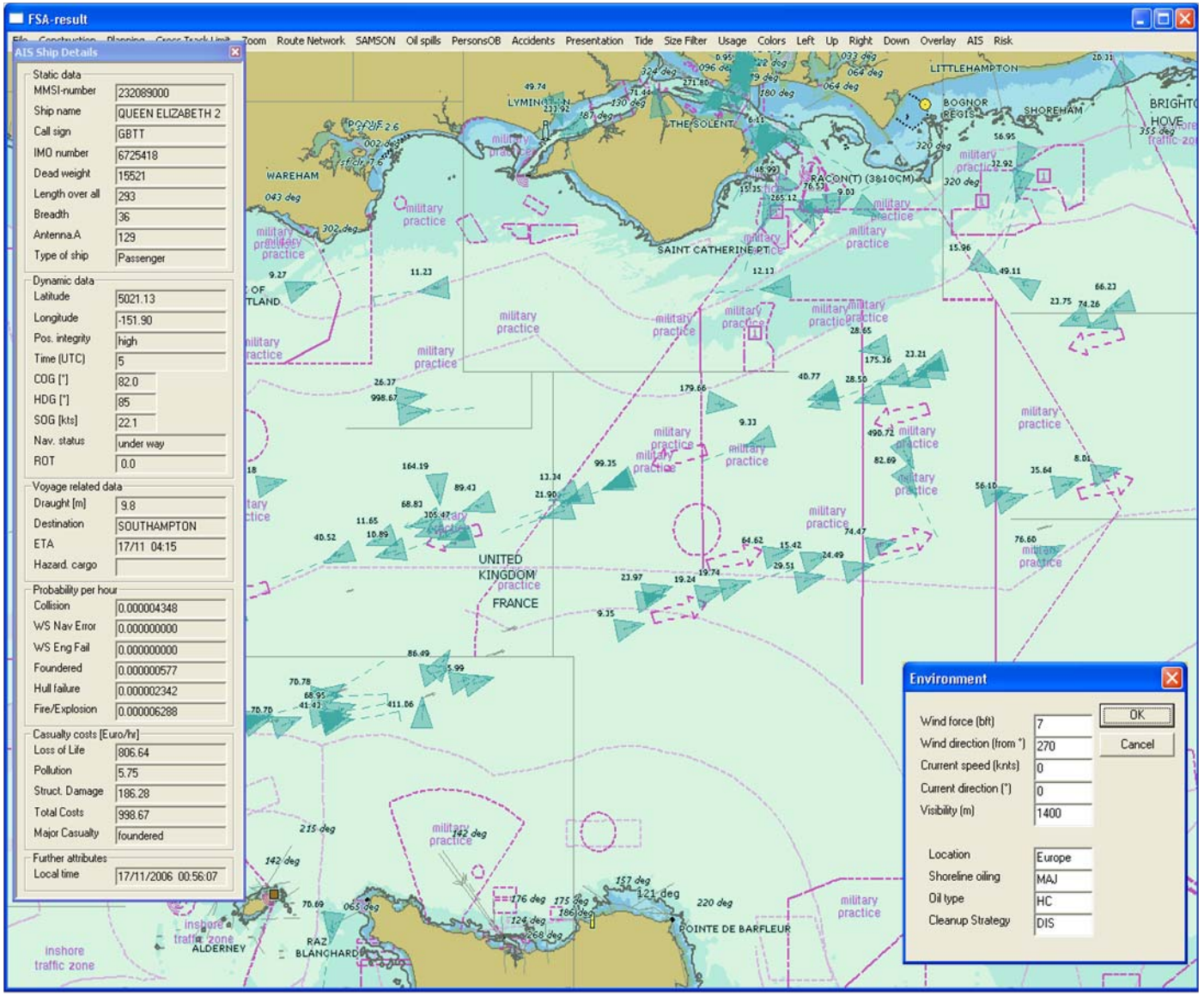


Collision risk depends on CPA (Closest point of Approach) and TCPA (Time to CPA)

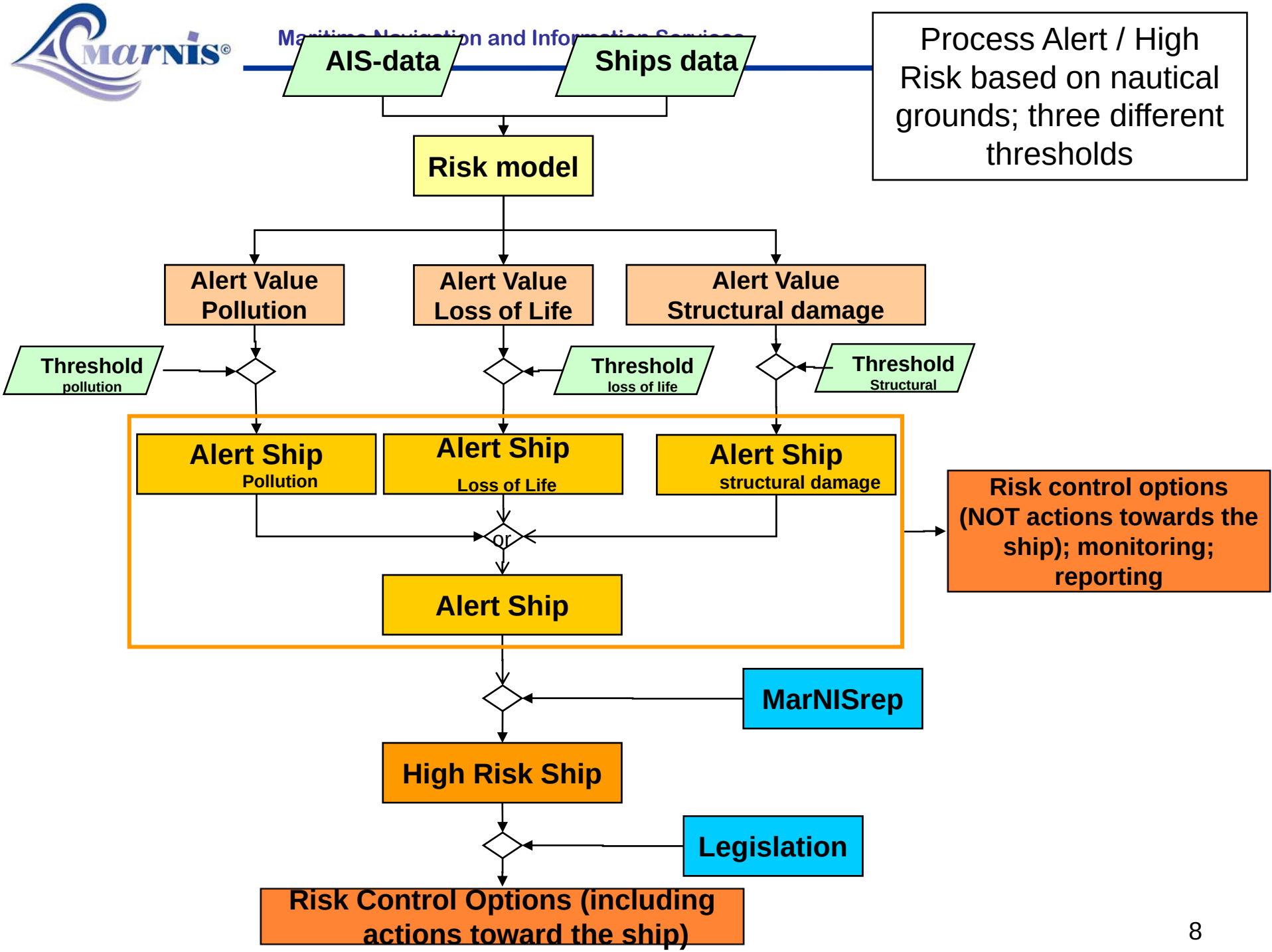
Multiplication factor due to age of vessel



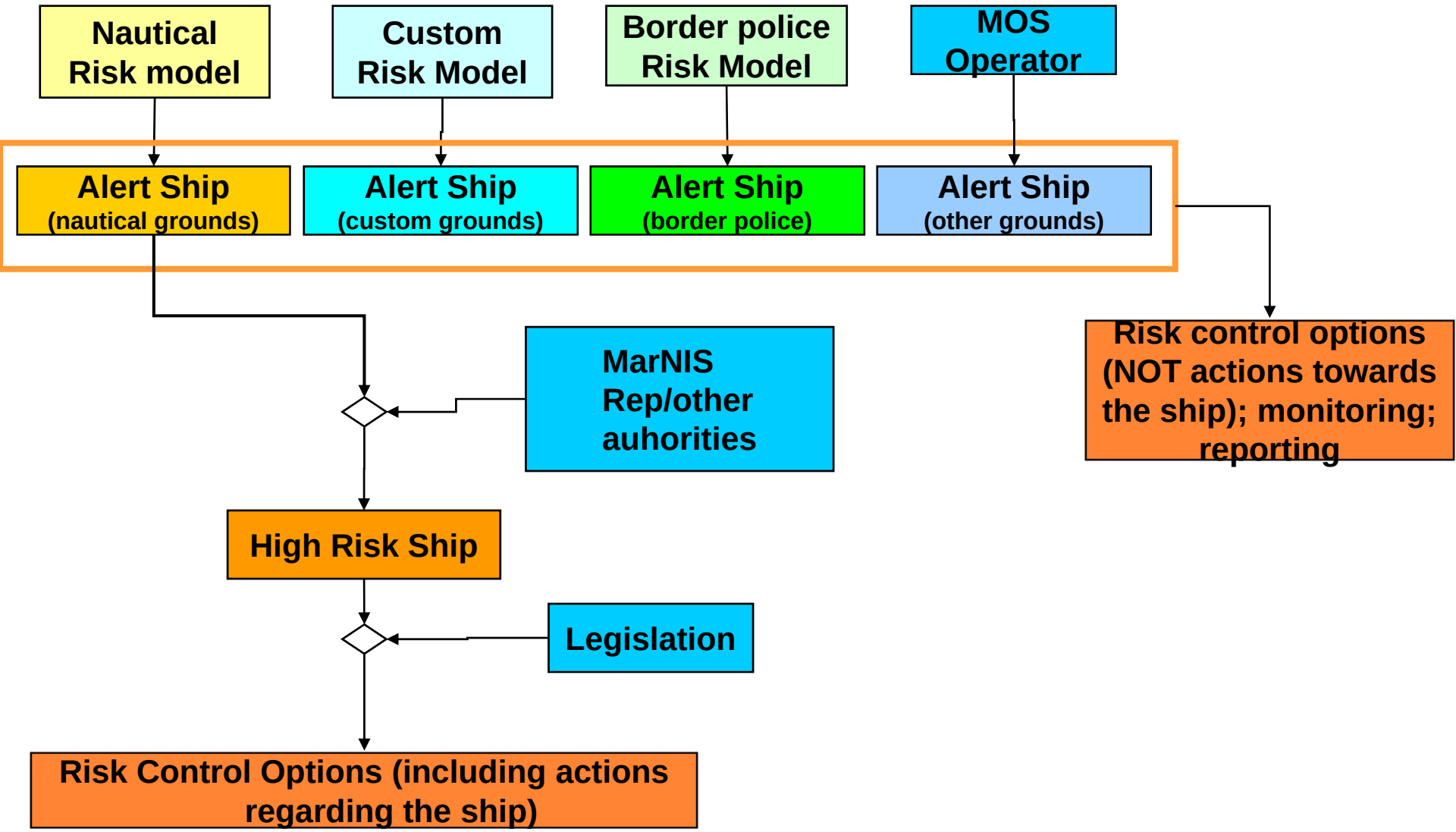
Example risk index



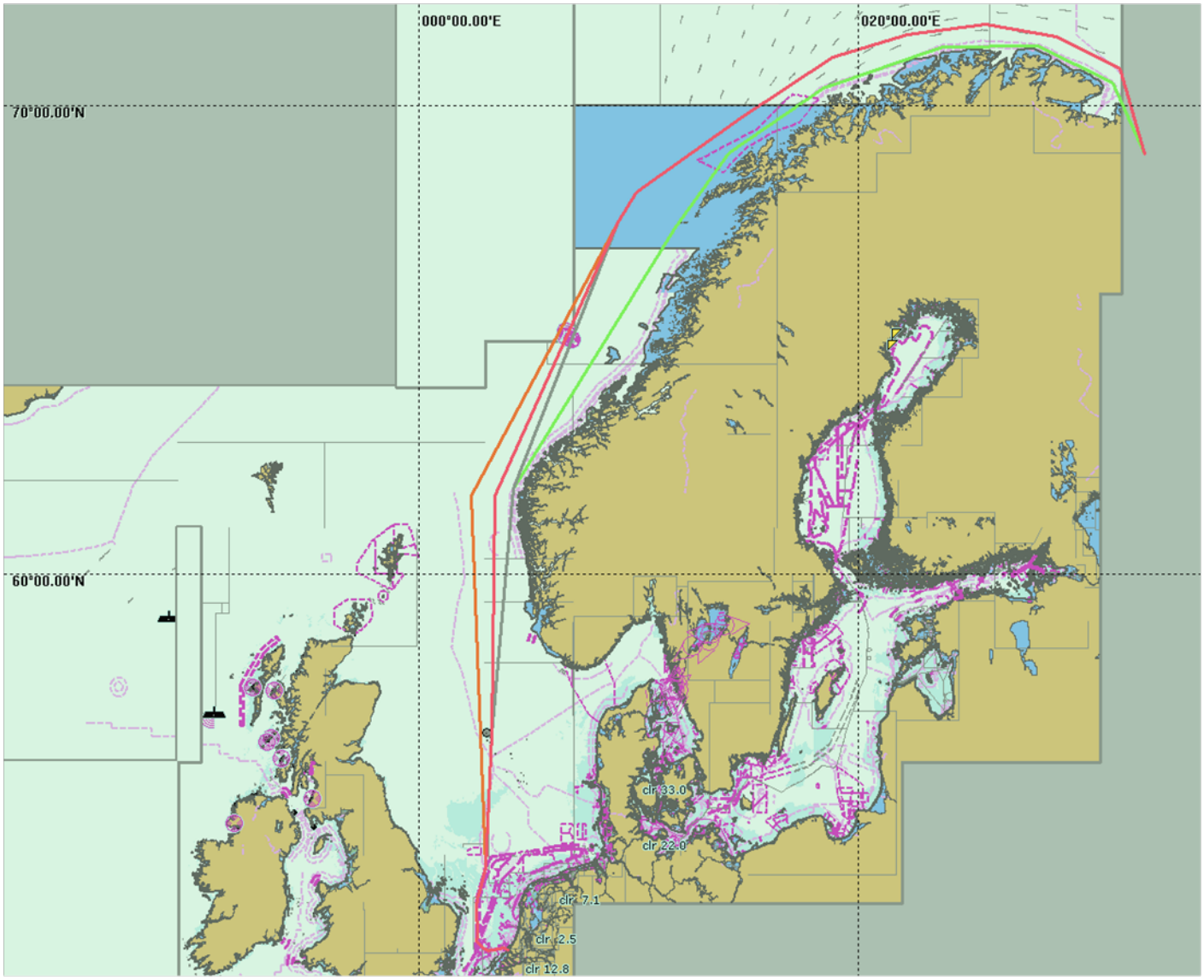
Process Alert / High Risk based on nautical grounds; three different thresholds



Process Alert / High Risk based on different risk models



An example


000°00.00'E
020°00.00'E
70°00.00'N
60°00.00'N
clr 33.0
clr 22.0
clr 7.1
clr 2.5
clr 12.8

Risk and voyage costs of a 100,000 tons tanker with BF 4

distance from coast	risk costs of the voyage	distance [nm]	speed reduction	costs of voyage	Total costs	Risk as % of total
5	€ 1.728	1686	1,00	€ 193.411	€ 195.139	0,9%
30	€ 1.655	1692	1,00	€ 194.105	€ 195.760	0,8%
60	€ 1.619	1704	1,00	€ 195.413	€ 197.032	0,8%

Optimum distance (y) from the coast for W wind