RISK ASSESSMENT AND POLICY OPTIONS FOR THE STRAITS OF MALACCA

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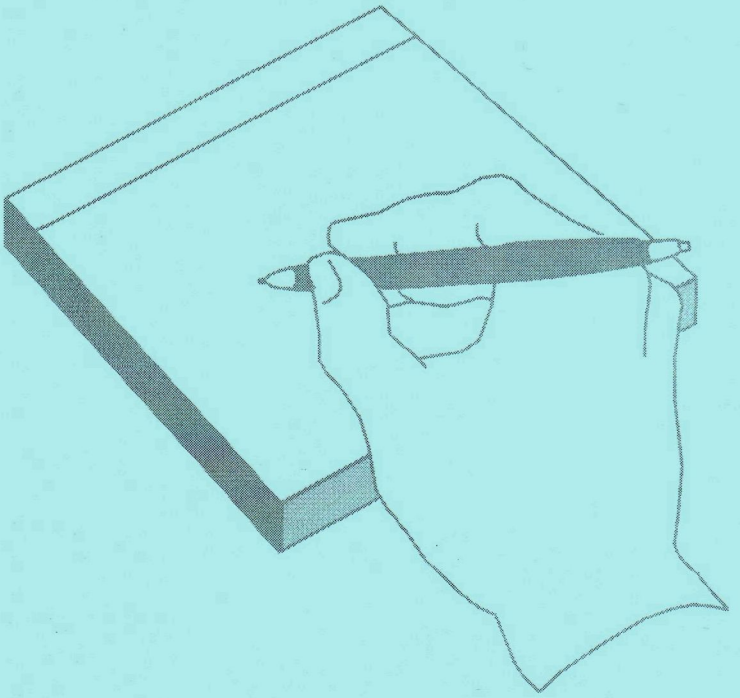
2009



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RISK ANALYSIS OF THE SHIPPING TRAFFIC IN THE STRAITS OF MALACCA & SINGAPORE

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Outline

- Seaborne Trade
- Statistic of shipping and cargo in SOM
- Risk assessment & shipping traffic
- Reduction Pollution hierarchy in SOM
- Risk Matrix
- Conclusion

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SEABORNE TRADE ASPECT

- In 2007, international seaborne trade was estimated at 8.02 billion tons of goods
- a volume increase of 4.8 per cent over the previous year

Source: UNCTAD,08

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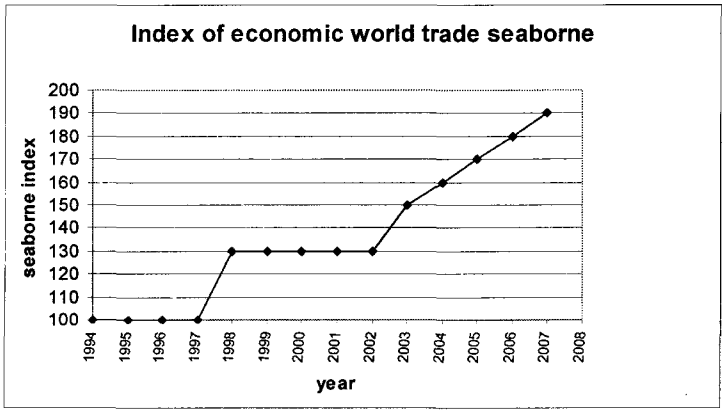
SEABORNE INDEX 1994-2007



Assumption:
•Volume of seaborne trade in 1994=100

•Source: UNCTAD , 08

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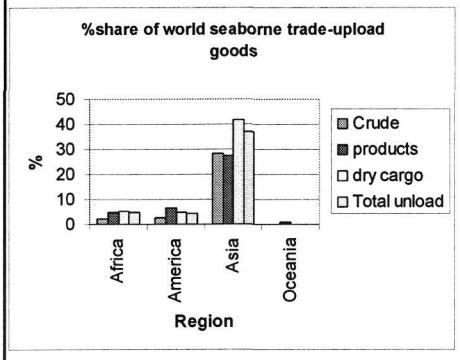
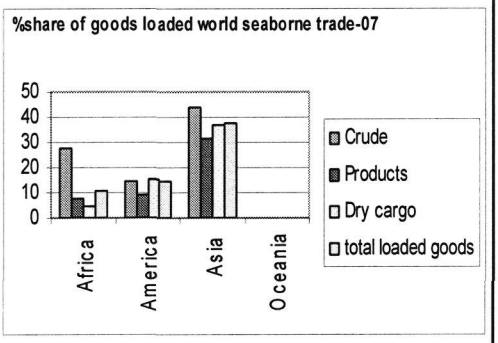
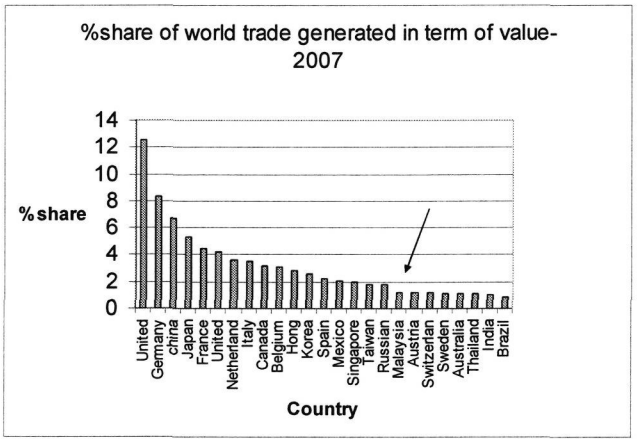
COMMODITIES INDEX, WORLD SEABORNE,2007





Source: www.ISL.org

MALAYSIA SHARE IN WORLD TRADE GENERATION



•Malaysia got the rank 18 between 25 major nations

Source: UNCTAD based on WTO Database

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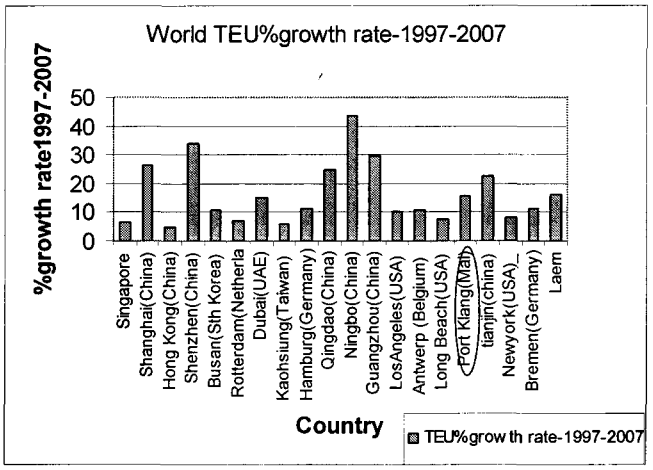
TEU *GROWTH* RATE-1997-2007



• Port Klang **Seaborne** trade growth rate is ranked in level 7 between 20 top world container ports between1977-2007

Source: www.ISL.org

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POST-ECONOMIC CRISIS

- Growth in the economics of East Asia and Pacific will slow because of financial crisis

BUT

- China's multi-billion dollar stimulus will secure their status as the world's fastest growing region (World Bank)
- Gross Domestic Product (GDP) in East Asia will rise 5.3%this year which down from previous estimate for 6.7%

Source:Starbiz-08April,09

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RISK

- **Risk terminology/IMO**: The combination of the frequency and the severity of the consequence

- Risk is evaluated using the probability and consequence to determine the priority for action , if any.

    - Risk= Consequence *x Probability*

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CONSEQUENCE

- **Terminology/IMO**: The outcome of an accident

- The severity of the outcome if an event occurs (hazardous, Non hazardous).

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HAZARD

- **Terminology/IMO**:A potential to threaten human life, health, property or environment.
- A **Situation** or **event** that may be a potential source of harm or damage through ship movement in SOM

Example:
1-Poor supervision of vessels
2-Lack of maintenance
3-Missing safety equipment
4-Carrying hazardous cargo
5-Having casualties in navigational road (wreck...)
6- Whether visibility

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FORMAL SAFETY ASSESSMENT METHODOLOGY

- identification of hazards;
- risk analysis;
- risk control options;
- cost benefit assessment; and
- recommendations for decision-making.

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RISK ASSESSMENT & SHIPPING TRAFFIC

- Look objectively at the ship movement in SOM
- Identify ship type in consequence of hazard for SOM
- Identify type of cargo in consequence of hazard for SOM
- Climate, Crew, convention....

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RISK ASSESSMENT FOR SHIPPING TRAFFIC

Risk=Consequence*Probability

Hazard consequence

- Cargo; Volume, Type
- Ship; type, age, Flag, Structural
- Climate; Rain, Haze, Fog
- Crew; Expert, Non-expert
- Navigational Equipment; Land, on ship board, Lighthouse, buoye
- Water Depth; Wreck, Shallow water
- Cross Traffic; percentage

Probability

- Frequency of passing vessels based on type of ship
- Frequency of different cargo passing through SOM
- Frequency of climate condition

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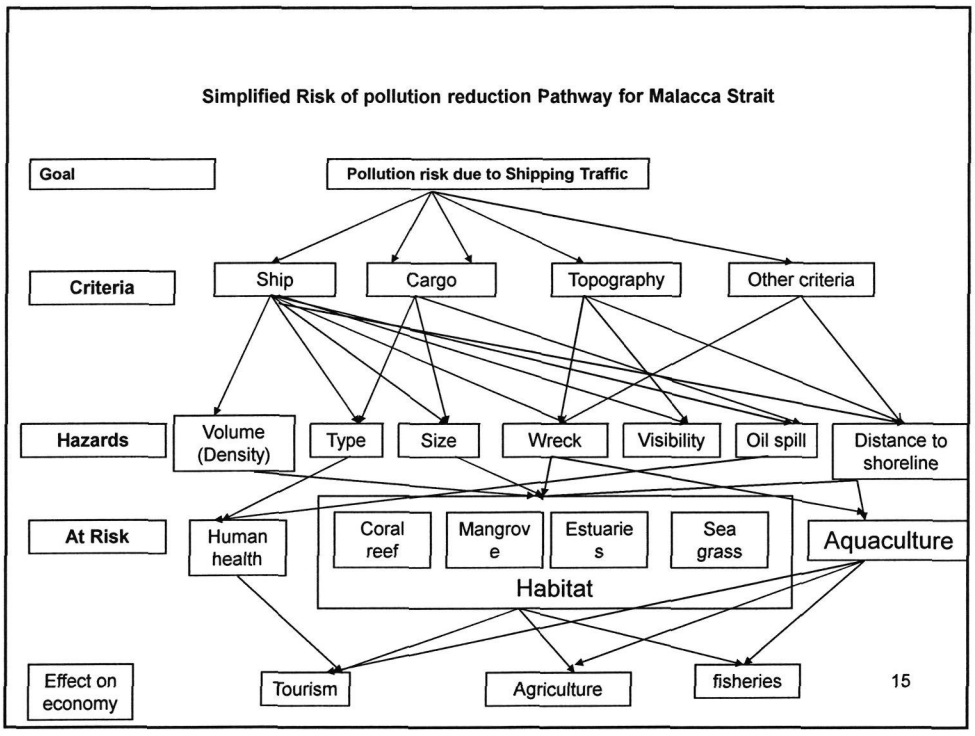

RISK MATRIX

Risk =Probability*Consequence

- To facilitate the ranking and validation of ranking, it is generally recommended to define consequence and probability indices on a logarithmic scale

Log (risk)=Log (Probability) + Log(Consequence)

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An example of a logarithmic severity & Frequency &Risk Index of Shipping Traffic-Vessel Reported to Port Klang, 2000-2007

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Vessels Reported to Port klang,2000-2007

Type of vessels	2000	2001	2002	2003	2004	2005	2006	2007	total	frequency
VLCC/DEEP DRAFT CR	3163	3303	3301	3487	3477	3788	3851	3753	28123	5.62
TANKER VESSEL	13343	14276	14591	15667	16403	14759	14784	14931	118754	23.74
LNG/LPG CARRIER	2962	3086	3141	3277	3343	3099	3297	3413	25618	5.12
GENERAL CARGO	6603	6476	6065	6193	6624	6340	6477	8467	53245	10.64
CONTAINER VESSEL	18283	20101	20091	19575	20187	20818	22615	23736	165406	33.06
BULK CARRIER	4708	5370	5754	6256	6531	7394	8129	9684	53826	10.76
RORO/CAR CARRIER	1761	1764	1980	2182	2440	2515	2863	3137	18642	3.73
PASSENGER VESSEL	3301	3151	3490	3033	2838	2299	2009	1870	21991	4.40
LIVESTOCK CARRIER	70	108	108	80	46	45	51	51	559	0.11
TUG/TOW VESSEL	774	610	422	478	568	420	372	444	4088	0.82
GOV/NAVY VESSEL	117	155	111	120	130	153	81	95	962	0.19
FISHING VESSEL	44	60	38	35	67	34	39	36	353	0.07
OTHERS	828	854	942	1951	982	957	1081	1101	8696	1.74
Total	55957	59314	60034	62334	63636	62621	65649	70718	500263	100.00

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FREQUENCY INDEX

Frequency → / Ship type ↓	Extremely Remote(1)	Remote(3)			Reasonably probable(5)		Frequent(7)	
	0<F<1	1<F<3	3<F<5	5<F<7	7<F<9	9<F<11	11<F<15	F>15
VLCC/DEEP DRAFT CR				*				
TANKER VESSEL								*
LNG/LPG CARRIER				*				
CARGO VESSEL						*		
CONTAINER VESSEL								*
BULK CARRIER						*		
RORO/CAR CARRIER			*					
PASSENGER VESSEL			*					
LIVESTOCK CARRIER	*							
TUG/TOW VESSEL	*							
GOV/NAVY VESSEL	*							
FISHING VESSEL	*							
OTHERS		*						

Modified from vessel traffic statistic in SOM (2000-2007)

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SEVERITY INDEX

Severity → / Ship type ↓	Catastrophic(4)	Sever(3)	significant(2)	Minor(1)
VLCC/DEEP DRAFT CR	*			
TANKER VESSEL	*			
LNG/LPG CARRIER	*			
CARGO VESSEL	*			
CONTAINER VESSEL		*		
BULK CARRIER		*		
RORO/CAR CARRIER				*
PASSENGER VESSEL			*	
LIVESTOCK CARRIER				*
TUG/TOW VESSEL				*
GOV/NAVY VESSEL				*
FISHING VESSEL			*	
OTHERS		*		

**Ranking is based on expert judgment

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RISK INDEX

Risk → / Ship type ↓	Negligible(0<R<4)	ALARP (As Low As Reasonably Practicable) (5<R<7)	Intolerable (R>7)
VLCC/DEEP DRAFT CR		*	
TANKER VESSEL			*
LNG/LPG CARRIER		*	
CARGO VESSEL			*
CONTAINER VESSEL			*
BULK CARRIER			*
RORO/CAR CARRIER	*		
PASSENGER VESSEL		*	
LIVESTOCK CARRIER	*		
TUG/TOW VESSEL	*		
GOV/NAVY VESSEL	*		
FISHING VESSEL	*		
OTHERS		*	

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MEANING OF RISK MEASURE

- " **Intolerable**" means that the risk cannot be justified except in extraordinary circumstances,
- "**Acceptable**" that the risk has been made so small that no further precaution is necessary, and
- **"ALARP"** (As Law As Reasonably Practicable), risk falls between these two states.

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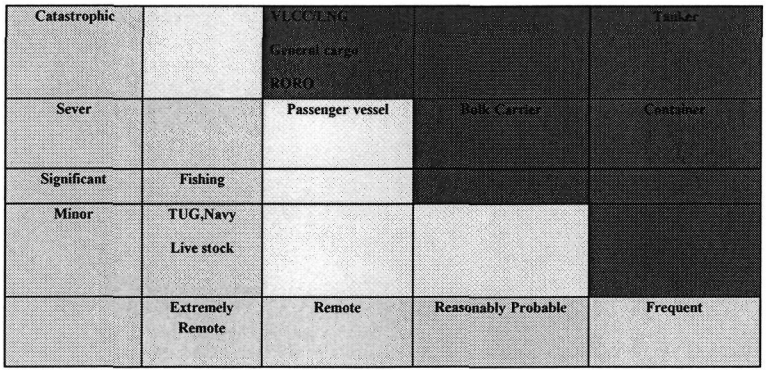
ALARP MATRIX; STRAIT OF MALACCA; 2000-2007;VESSEL NUMBER / TYPE



- Acceptable
- ALARP
- Intolerable

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MATRIX RESULT

- Risk from Tanker, general Cargo, Container, bulk carrier and VLCC is high during 2000-2007 in SOM
- Risk from Passenger ships is in ALARP level
- Risk from TUG/Livestock/fish vessels and navy vessel is minimum one
- Different level of risk from different type of vessels need different Risk Control Options (ROCs)
- For Clean Straits:

* Reduce the probability of the occurrence

* Reduce the severity of the consequence

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RECOMMENDATION

**Control the Risk

- Do not use Strait as International waterway- Impossible
- Find solution to reduce the risk
- Develop a positive approach to reduce the risk like cultural way for crew and users
- Re assess the risk in Malacca Strait after short time (5-10 years) after reduction plan has been taken

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FURTHER IMPROVEMENT

ONGOING STAGE OF CURRENT PROJECT

- Organize data in different category using GIS
- Integrate and analyze data in GIS
- Leverage data to make critical decision for assessment, planning and management
- Rather than you work to understand data GIS put the data to work for you
- Provide a powerful dynamic database to predict future scenario of SOM based on changes which might happen

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THANK YOU

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OVERALL LOOK ON SEABORNE TRADE

- Asia Total loaded and uploaded cargo is 6,034 Mill tonnes in 2007
- Malaysia Total loaded and uploaded cargo is 394Mill tonnes in 2007
- Share of Malaysia from Asia country in seaborne trade is **%6.53** (2007)
- Share of port in Malacca strait is **%4.30** (2007)
- An increase rate of 1.5% figure out in cargo load and upload in Strait of Malacca on year 2006

Source: UNCTAD based on WTO Database

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