ISPO International Users Group

Improving Risk Assessment Techniques

Richard Robinson

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Mikhail Lermontov sonar (Port Gore) -

Marlborough Sounds

Marine pilots are generally against this scenario.

Marine pilots are generally for this scenario.

International Standard for maritime Pilot Organizations

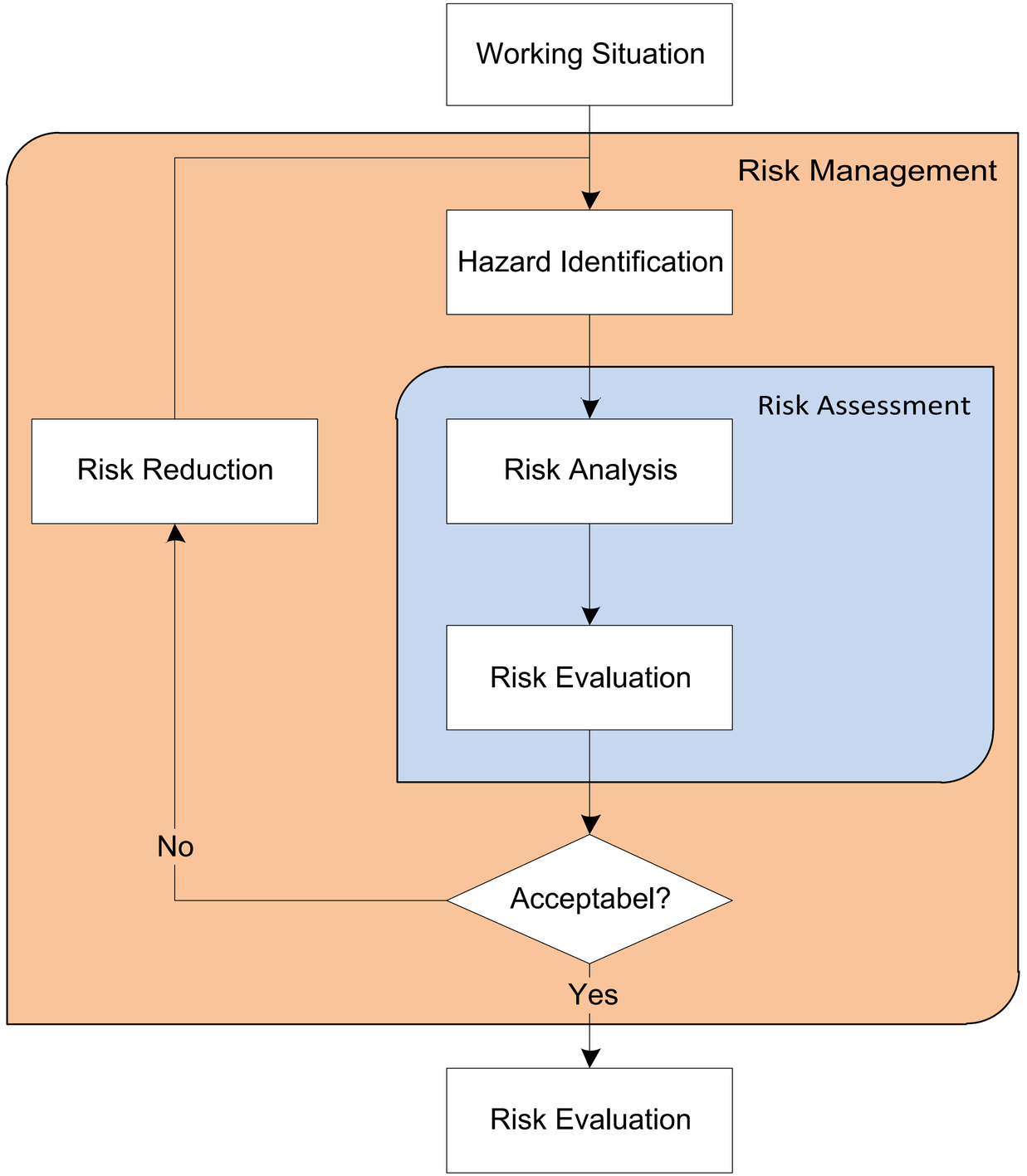
Part B

11 RISK, INCIDENT AND ACCIDENT MANAGEMENT

According to Part B:

11.2.f Risks can be managed by taking the following steps: (shown opposite)

Actually, they can't.
Not for high-consequence low-likelihood events



This especially can never be an analysis tool, but it can be a reporting tool

Consequence					Probability		
Severity	People	Hardware	Pollution	Reputation	A	B	C
					Never heard of in company	Incident has occurred in the company	Happens several times per year in the company
0	No injury	No damage	No environmental effect	No Damage	Level 1		
1	First aid treatment	Damage < € 50.000,-	Slight environmental effect (< 10l)	Slight damage Customer complaint			
2	Lost time incident	Damage > € 50.000,- < €100.000,-	Minor environmental effect (< 100l)	Minor damage Local press		Level 2	
3	Hospitalised	Damage > € 100.000,- < € 250.000,-	Local environmental effect (> 1m³)	National Press			
4	Fatality	Damage > € 250.000,-	Massive environmental effect	Severe damage International Press			Level 3

The reasons are straight forward

It is not possible for a credible, critical, catastrophic event ever to be considered acceptable.

Risk analysis for high consequence, low likelihood events is non-scientific. It is not repeatable or falsifiable, especially spot-the-dot risk assessments.

It is contrary to the principle of reciprocity which is enshrined in all major philosophies and religions, and in Australia at least, in legislation and the common law.

However, there is a practicable way forward that has been used very successfully for most Australian Ports including Port Hedland, Sydney Ports, Melbourne Ports, Tasports, Queensland Ports, and some NZ ports.

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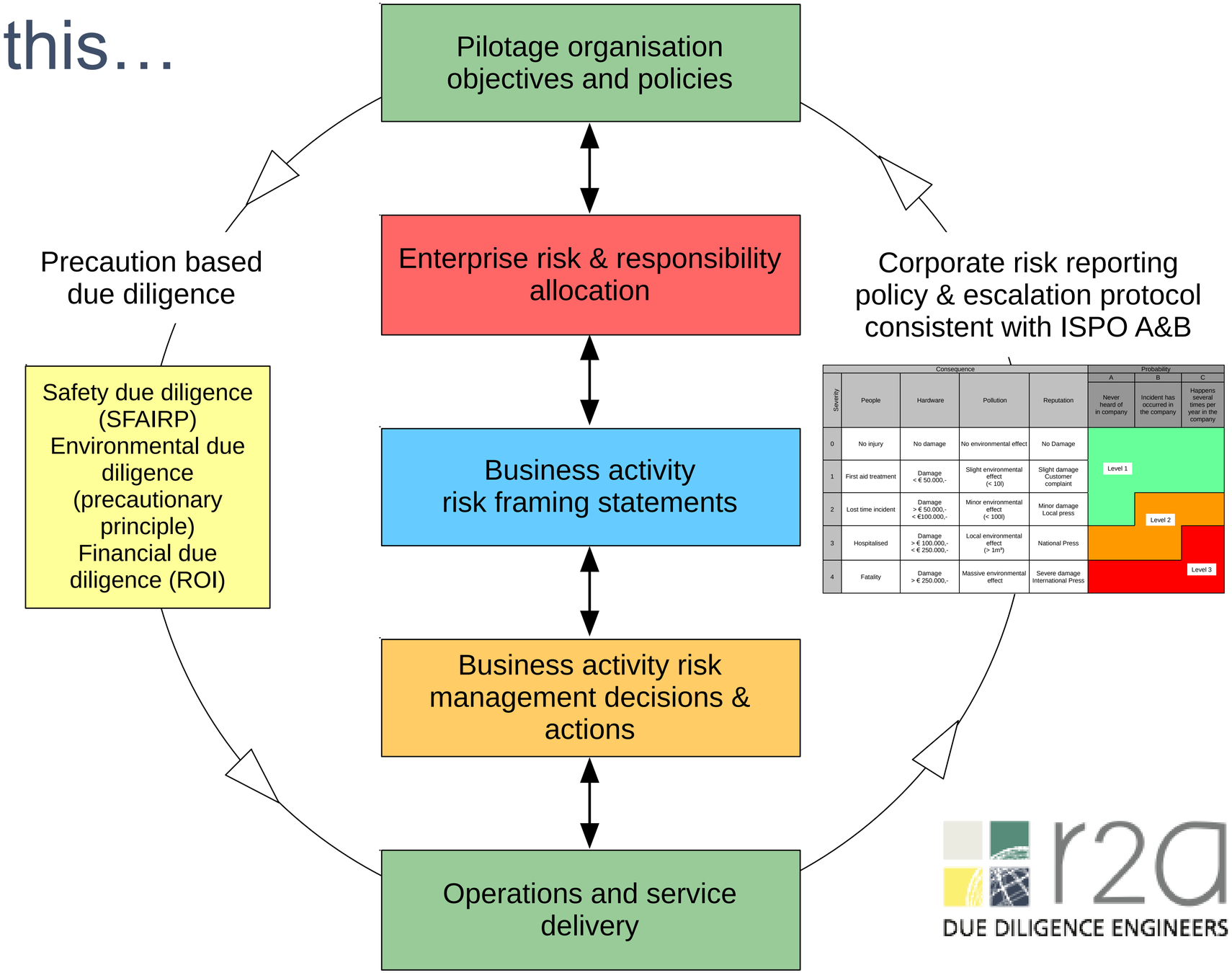
A synthesis like this…



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Some results of such a due diligence process has been:

Reducing the compulsory pilotage port limits in Sydney Harbour.

Small vessel abort ground exclusion zones around the Tasman Bridge.

Determination of the number tugs required to move ships at Port Hedland.

Increased the number of markers for the Bell Bay transit.

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An example - Sydney Ports

Sydney Ports Pilotage Safety Due Diligence Review (2013) and its implications, particularly the rejection of the use of the Risk Management Standard (ISO 31000) and the IMO Formal Safety Assessment process.

Done in association with Ravi Nijjer

SYDNEY PORTS PILOTAGE SAFETY DUE DILIGENCE REVIEW
Gaye Francis, Capt Philip Holliday, Richard M Robinson
Paper and presentation to the AMPI Conference, 18th May 2015

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Due Diligence

Due diligence is a legal concept and represents an aspect of moral philosophy, that is, how the world ought to be and how humanity should behave in order to bring this about.

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Due Diligence

Conceptually, it appears as a manifestation of the ethic of reciprocity or the golden rule historically prevalent in major philosophies and religions, along the lines that one should treat others as you would like to be treated by them.

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Due Diligence

It is forensically tested by our courts with the advantage of hindsight, for example, using the ‘reasonable person’ test.

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The Reasonable Person

The reasonable person is not any particular person or an average person… The reasonable person looks before he leaps, never pets a strange dog, waits for the airplane to come to a complete stop at the gate before unbuckling his seatbelt, and otherwise engages in the type of cautious conduct that annoys the rest of us… "This excellent but odious character stands like a monument in our courts of justice, vainly appealing to his fellow citizens to order their lives after his own example."

J M Feinman (2010). Law 101. Everything You Need to Know About American Law. Oxford University Press. Page 159.

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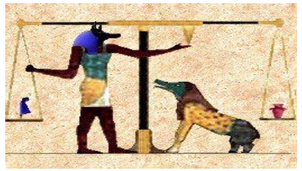
Precaution vs Hazard in Court

Precaution focussed



Judicial Scrutiny

Future Uncertainty

Safety critical

Decision

Unwanted Event/s

Judgement

Time

Future Uncertainty

Scientific and technical risk targets

Hazard focussed

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Due diligence v the ISPO

Due diligence approach
(precaution based and criticality driven)

ISPO approach
(hazard based and risk driven)

Hazard identification
(**Foreseeability**)

Criticality
Establish critical threats & hazards

Preventability
Identify all practicable precautions for each hazard following the hierarchy of control

Reasonableness
Determine which practicable precautions are reasonable based on the High Court established balance

Implementation
of reasonably practicable precautions

Monitoring and Review
(Quality assurance)

Due Diligence

Criticality driven

Risk driven

Risk Management
of downside (negative or pure) risk

Hazard analysis and risk calculation
process to determine the nature of risk and the level of risk
(inherently unrepeatable)

Selected risk criteria
terms of reference against which the significance of a risk is evaluated
(inherently subjective)

Compare against criteria
process of comparing the results of risk analysis with risk criteria to determine whether the risk and/or its magnitude is acceptable
(may eliminate further consideration of acceptable or tolerable risks)

Risk mitigation and management options
process to modify risk.
(may not follow the hierarchy of controls)

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Paradigm shift from hazard to precaution based risk assessment

Judicial Due Diligence (precaution based)	ISO 31000, IMO, ISPO et al (hazard based)
Establish the context Risk assessment (precaution based): Identify credible, critical issues Identify precautionary options Risk-effort balance evaluation Risk action (treatment)	Establish the context (incl. criteria) Risk assessment (hazard based): (Hazard) risk identification (Hazard) risk analysis (Hazard) risk evaluation* Risk treatment

* From the definition in ISO 31000:
2.24 risk evaluation process of comparing the results of risk analysis (2.21) with risk criteria (2.22) to determine whether the risk (2.1) and/or its magnitude is acceptable or tolerable

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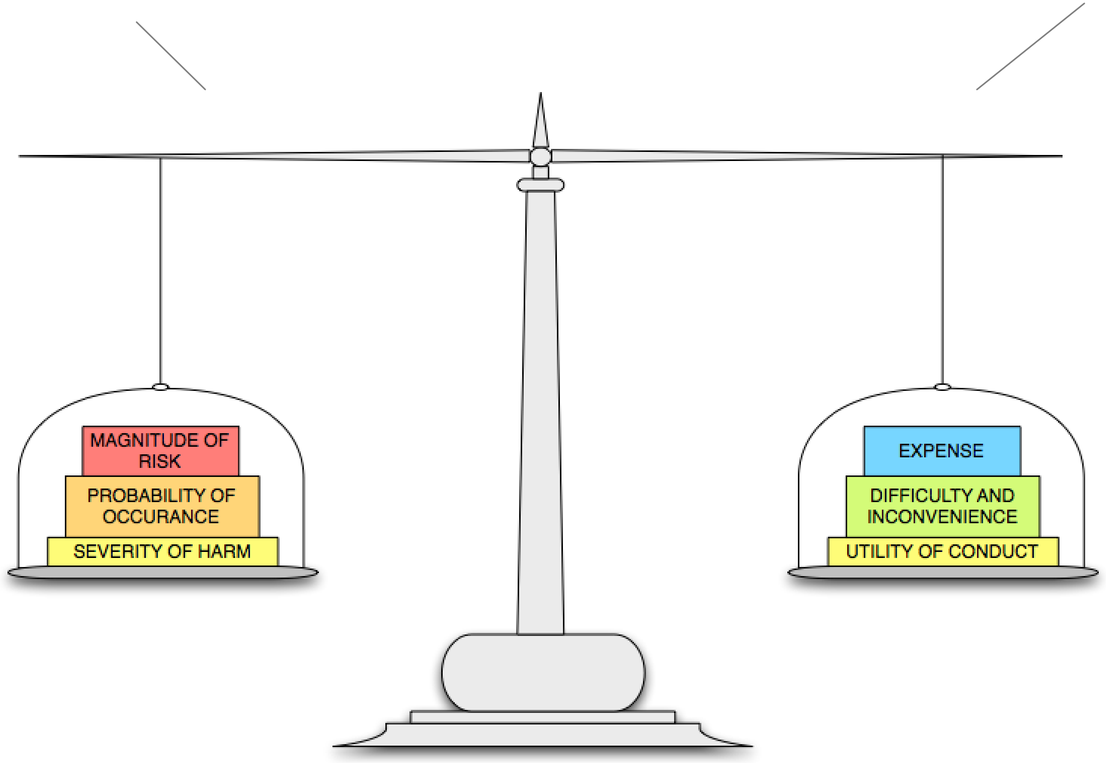
The Due Diligence Approach

All credible, critical issues identified

All practicable precautionary options identified



Disproportionality decision making engine used to determine 'reasonableness'

Agreed precautions implemented with supporting QA system

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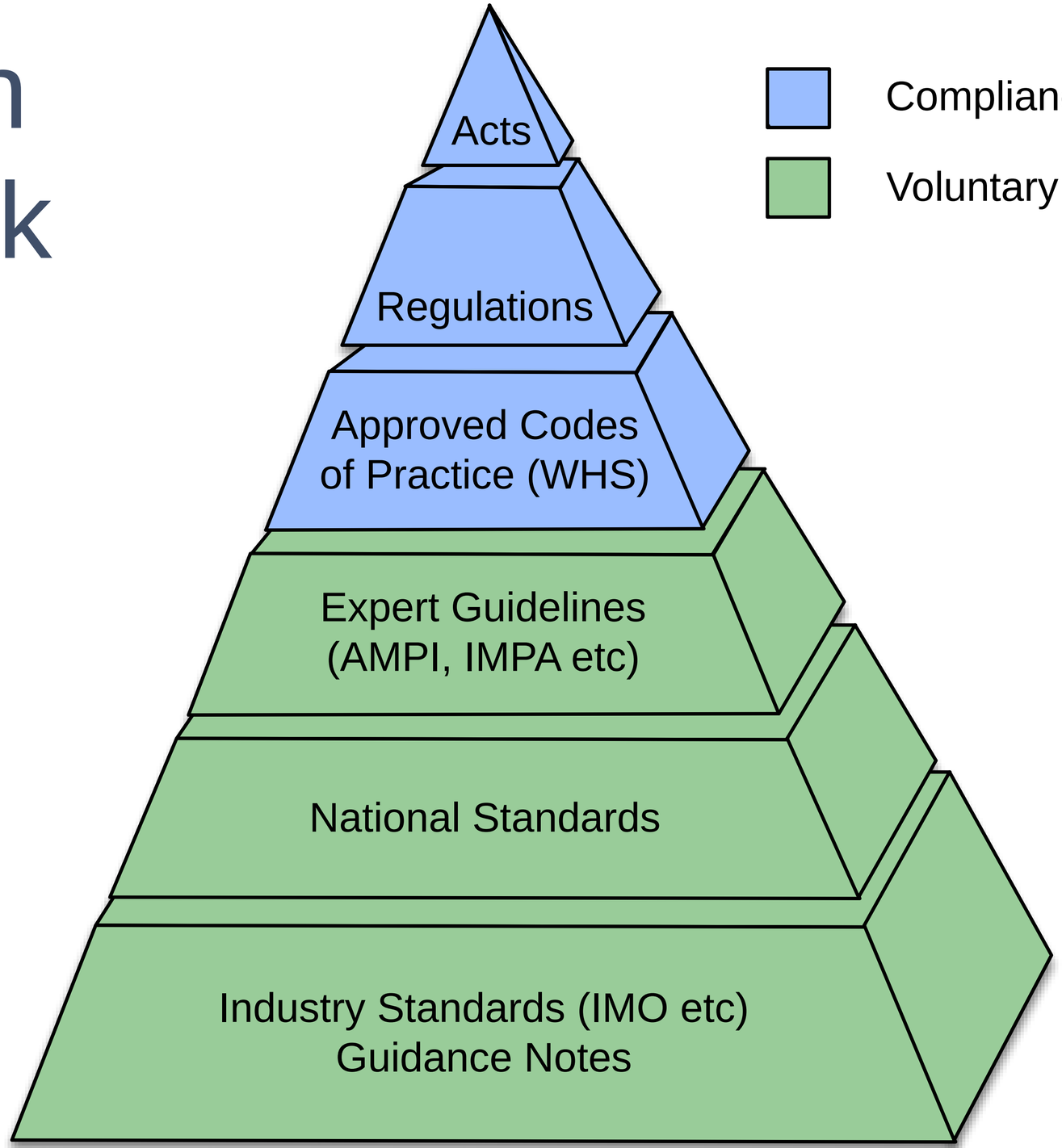
Australian framework



Compliance is mandatory

Voluntary guidance material

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Identification of all Credible Critical Issues

The first step is to build an argument as to why all credible, critical issues have been identified. This can be done in a number of ways including the threat and vulnerability technique, which is derived from the military intelligence community. In essence this asks the question: What exposed groups are we trying to protect and to what credible threats are they exposed? An exposed group can be vulnerable to a number of threats. This is usually done functionally and geographically.

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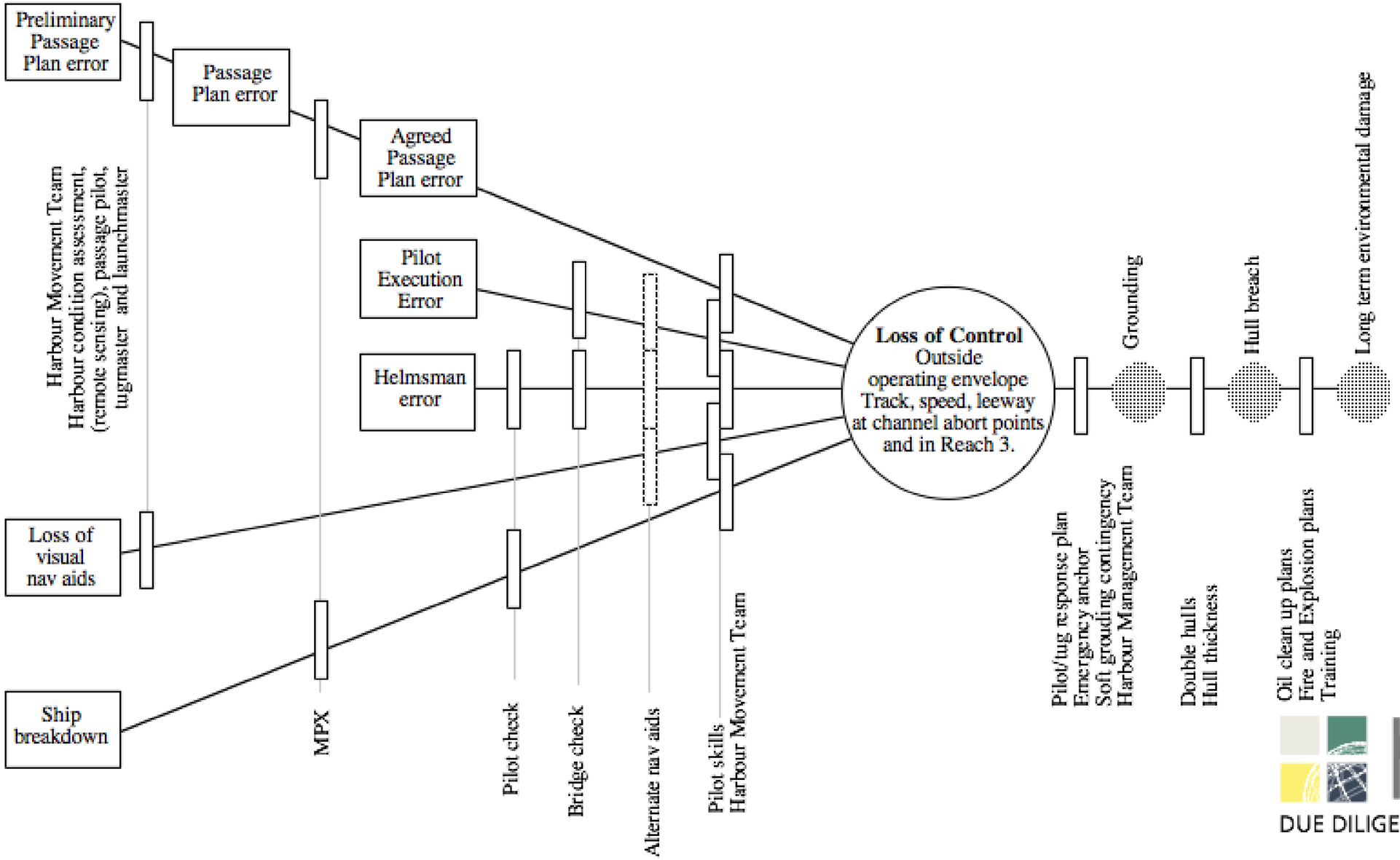
Identifying all (possible) Practicable Precautions



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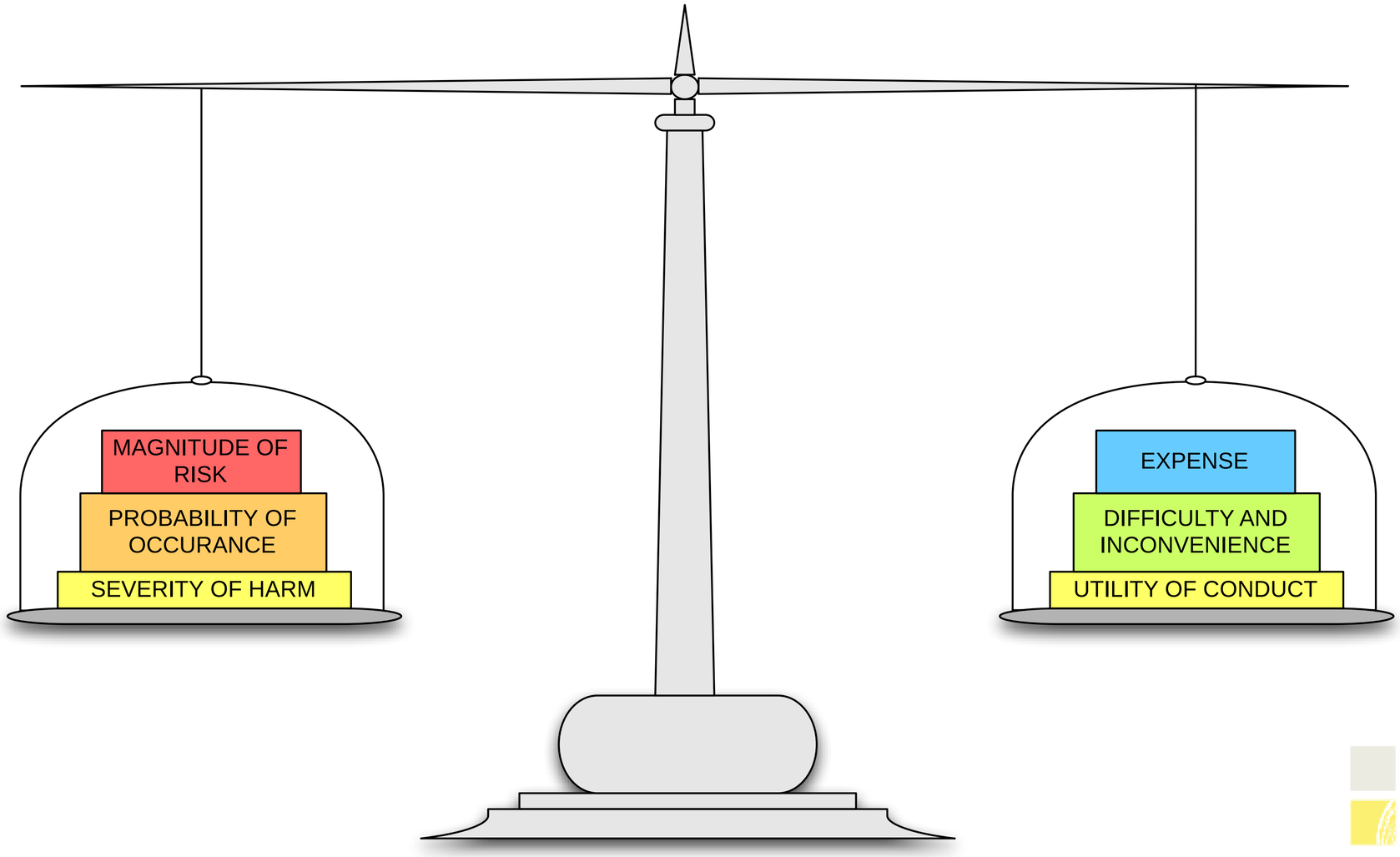
Reasonableness



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Reasonableness

The perception of a reasonable man's response calls for a consideration of the magnitude of the risk and the degree of probability of its occurrence, along with the expense, difficulty and inconvenience of taking alleviating action and any other conflicting responsibilities which the defendant may have.

Mason J. of the High Court of Australia
Wyong Shire Council vs Shirt (1980) 146 CLR 40.

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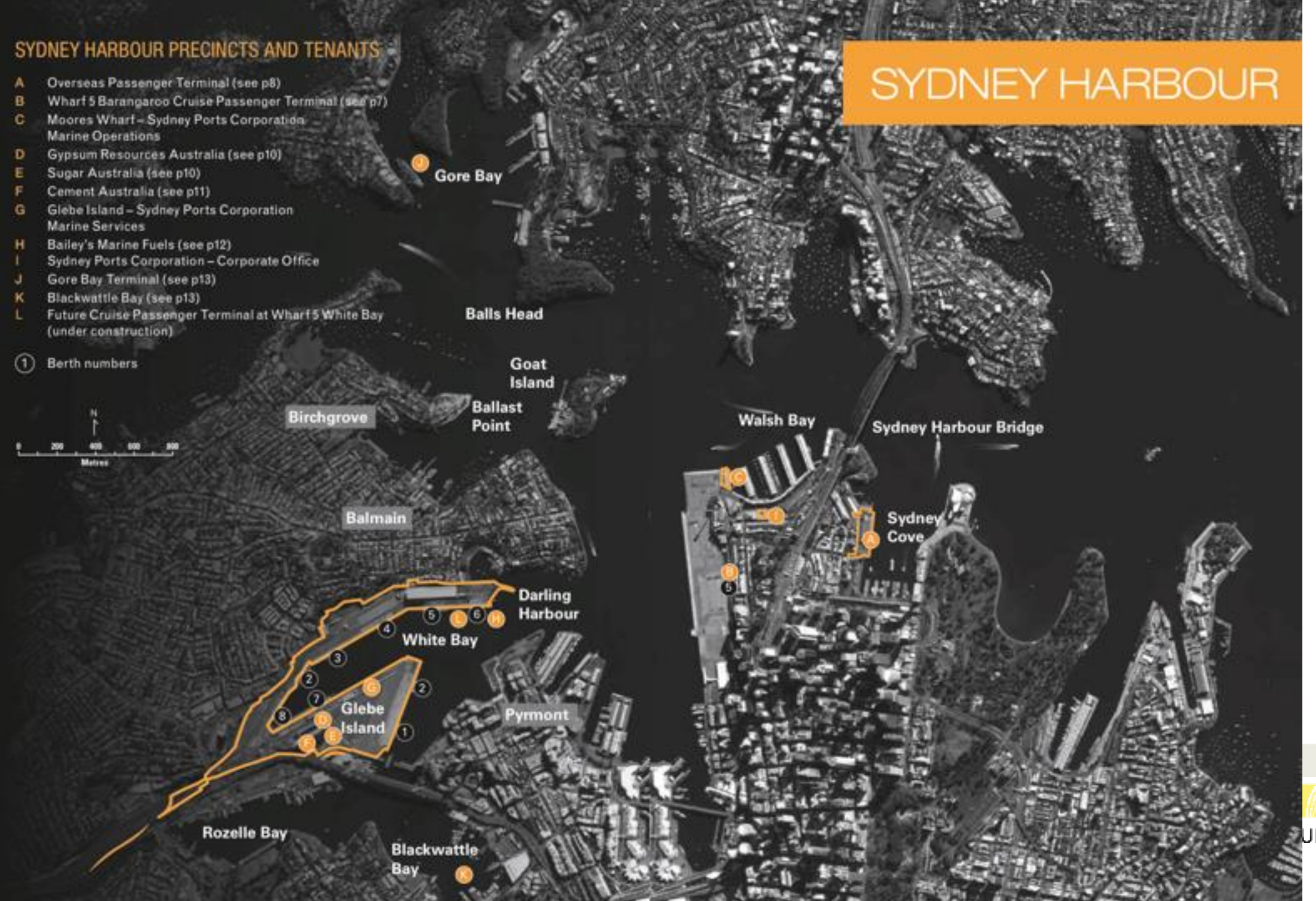

Port Jackson

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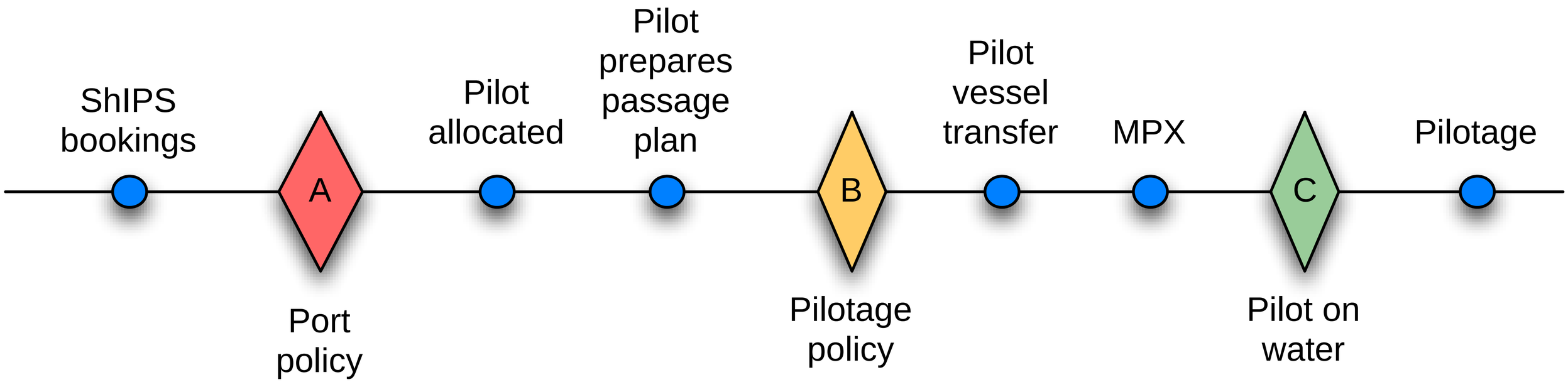
Go, No-Go Decision Points



A. Port Policy as described in the Harbour Masters Directions and Central Booking System Procedures. This checks for vessel size, type age, berth specific parameters and vessel condition, under keel clearance etc.

B. Pilotage Policy based around environmental conditions. This is generally established by pilot embarkation safety requirements. Special cases are determined after consultation with the pilots, normally the Pilot Manager and check pilots.

C. Pilot on water go, no-go decision. This is based on the actual conditions on the water. For example, unexpected high winds or fog, insufficient tugs available etc.

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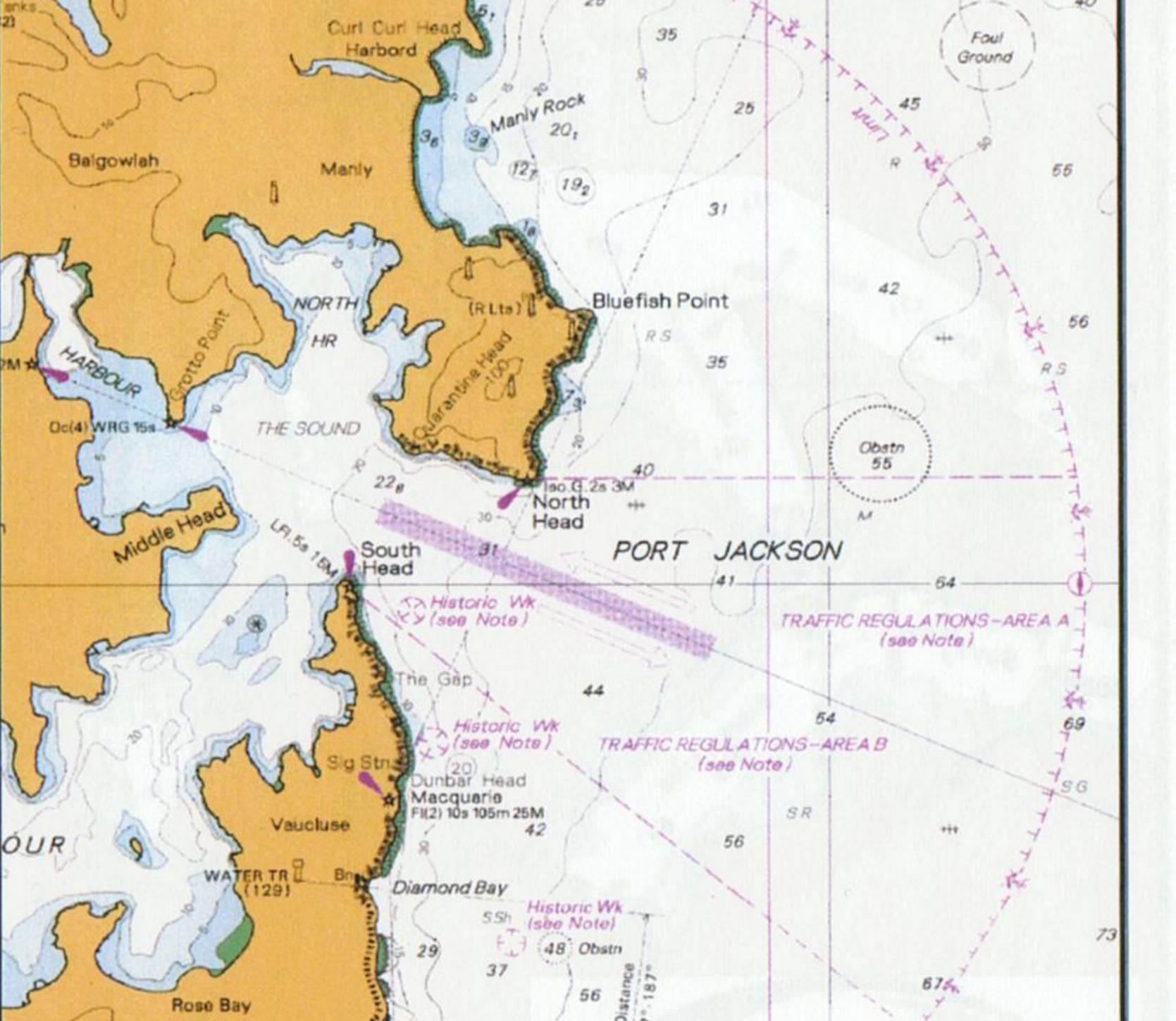

Zonal Vulnerability Assessment

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Precautionary Assessment

Reference	Issue	Possible further precautions	Pilot's response	Action
Pilot embarkation to line Zulu.	Should the pilot be on board and have conduct of the vessel at the 4nm port limit (compulsory pilotage area)? From an arrival safety perspective, the pilot should have conduct of the vessel at 2nm and be north of the separation zone. If not, there is adequate sea room to turn back. On departure, if all clear and safe to do so, pilots often disembark at 2nm, well within the compulsory pilotage area.	Reduce the port limit and compulsory pilotage area to 2 or 3nm whilst leaving the pilot boarding ground at 4nm as shown.	Any solution needs to take into account that pilots need to comply with relevant legislation. Of the possible solutions considered the one considered the most suitable is to lobby for an amendment(s) to the NSW Marine Safety Act 1998. The purpose of the amendment(s) would be to create a "compulsory pilotage zone" inside the port limits of each port. It is proposed that the limit of the new zone would be a line of radius approx.. 1.5 – 2.0nm from Henry Head in Botany Bay & approx. 1.5 – 2.0nm from South Head in Sydney Harbour, i.e. 2.0 – 2.5nm inside the port limits of each port. The harbour master has committed to consult with the pilots to come to an agreed position regarding any proposed amendment(s) to legislation, which may include the solution above.	For further consultation & action between pilots & the HM, prior to approaching Transport NSW. Port limit to remain but compulsory pilotage area to be redefined consistent with the requirements of the PSMS. Harbourmaster to liaise with review of the legislation. May take 6 or 12 months to resolve.

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Avoiding the Rumsfeld manoeuvre

Pilot Stakeholder Group

i) Are there any other issues of concern which have not been considered?

ii) Are there any other practicable precautions, the value of which has not been tested?

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Satisfies legal counsel

The arguable result is that every reasonably practicable precaution for all credible critical issues associated with the pilotage of vessels in Sydney Harbour is in place (and is not prohibitively dangerous) the essence of a due diligence argument.

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Hazard based Risk Process Rejected

Such a process specifically rejects the Formal Safety Assessment (FSA) method of the IMO, the ISPO and the Risk Management Standard (ISO 31000) approach. It is also more robust, quicker, simpler and cheaper to complete.

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Overall

“It is better to be vaguely right than exactly wrong.”

Carveth Read, Logic, deductive and inductive (1898).

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