

The Risk Assessment problem starts with compilation of information regarding the situation to be resolved		
Step 1 - Information related to the incident		Time of the latest update (from SITREP, Form A and Form B)
Location of the vessel		
What is the problem and associated issues		
Seaworthiness of the ship concerned, in particular buoyancy, stability, availability of means of propulsion and power generation, docking ability, etc		
Describe what could happen (risk scenarios, hazards, risks)		
Wind direction and speed		
Vessel status (e.g. Underway, NUC, RAM, etc.)		
Drift rate and direction		
Forecasted wind		
Waves height		
Forecasted waves		
Quantity of bunker/fuel		
Quantity of oil as a cargo		
Hazardous material on board		
Financial security/Insurance certificate		
Number of crew onboard		
Assessment of fatigue		
Location of spill response equipment ashore		
Salvage options		
Location of rescue tugs		
Is the master (or representative of the master, e.g. chief mate) still on board?		
Information on the intention of the master and/or salvor		
(Fill in additional Info as required...)		

Rapid Options Analysis Decision Support (ROADS) Tool Usage Instructions

ordered sequence of tabs, in which the Risk Assessment Team (RA Team) will fill in qualities representing their view of the situation and risks. The entry points are all shaded "Turquoise", and the remainder of the sheets are protected. Important values are carried from sheet to sheet automatically.

The methodology of this tool relies on a progressive elimination and ranking of available options

greatest chance of success while minimizing potential impacts in the event that one of the 3 pre-identified outcomes associated with that option manifests.

Detailed and specific instructions are given on each sheet

The order of steps is as follows:

1. Fill in Situation Particulars

either GO or NO-GO

not have to be considered

If Step 2 fails to yield a clear preferred choice of COA, then Step 3 is conducted as a Rapid Risk Assessment

3. Score COA Outcomes for Probability & Consequence, select Best COA based on Risk Scores, Success Factors, Risk Factors and Risk/Success Ratios

generated

In this table the RA Team defines the COA and rates them for Feasibility and Suitability, as well as Risk Factors

1. The RA Team names the COA and adds a brief description in rows 21-25 below
2. The names of the COA are carried forward to row 29, columns E-J automatically
3. The RA Team then rates the COA against Feasibility/Suitability and Risk Factors by inserting "✓" or "X" under columns E to J in rows 32-47 and rows 54-73
- 3.1 Inserting "✓" to a Feasibility/Suitability factor means that the COA meets the defined criteria of this factor (see comments inserted for each factor).
- 3.2 Inserting "X" to a Risk factor means that the COA has the potentiality of resulting in the damages or impacts detailed under this factor (see inserted comments), whereas a "✓" means that there is no or low potential for damages or impacts.
- "✓" are thus considered positive/desirable values and "X" negative/undesirable values
4. Sub scores, for the Feasibility/Suitability factor categories (Geography, Navigation, Response and Ressources) are presented on row 36, 40, 44 and 48.
- 4.1 The scores are calculated according to the percentage of "✓"
5. Sub scores, for the Risk factor categories (Material, Human Health, Living Resources, Livelihood and Cultural) are presented on row 56, 60, 66, 70 and 74.
- 5.1 The scores are calculated according to the percentage of "X"
4. The scores on row 77 and 78 are calculated according to the percentage of "✓" for success factors (suitability/feasibility) and the percentage of "X" for risk factors
5. A ratio of Risk/Success is calculated in row 79 as an indicator of the balance of Risk vs Success. COA with small ratios are the most suitable ones
6. For any COA in which the "Space and Depth" are insufficient, an automatic "X" is returned at row 81
7. The RA Team then makes a deliberate ruling on which COA are still Active at row 82

COA #	Courses of Action name	Elaboration
1	Refuse POR	Default Option ... leave ship offshore
2		
3		
4		
5		
6		

COA #	1	2	3	4	5	6
Courses of Action name	Refuse POR	0	0	Nil	Nil	Nil
Feasibility/Suitability (Success Factors)	✓ / X	✓ / X	✓ / X			
30.77%	Geography: Space and depth					
	Geography: Shelter					
	Geography: Anchoring (holding ground)					
	Geography: Natural confinement of water pollution					
% of "Geography" success factors met (✓ (green))	0%	0%	0%			
23.08%	Navigation: Towing capacity					
	Navigation: Safe transit/motion					
	Navigation: Distance/Time to refuge vs. Urgency					
	% of "Navigation" success factors met (✓ (green))	0%	0%	0%		
23.08%	Response: Salvage capacity					
	Response: Firefighting assistance					
	Response: Spill response					
	% of "Response" success factors met (✓ (green))	0%	0%	0%		
23.08%	Ressources: Logistics					
	Ressources: Security					
	Ressources: Communications					
	% of "Ressources" success factors met (✓ (green))	0%	0%	0%		
100%						

* A green colour-coded cell is a desirable/ positive value and a red colour-coded cell is an undesirable/ negative value

* In case of lack of information or if a specific success factor is irrelevant to the scenario, input all COA with a ✓. The balancing of success factor scores for all COA will amount to annulling this factor.

Proportion of factor categories	Risk Factors	✓ / X	✓ / X	✓ / X
12.50%	Material: Potential loss of ship			
	Material: Potential damage to navigation infrastructure			
	% of "Material" risk factors (X (red) = some to high risk)	0%	0%	0%
18.75%	Human Health: Potential injury/death of crew			
	Human Health: Potential injury/death of response personnel			
	Human Health: Potential injury/death of general population			
	% of "Human Health" risk factors (X (red) = some to high risk)	0%	0%	0%
31.25%	Living Resources: Potential impact on fish			
	Living Resources: Potential impact on marine mammals			
	Living Resources: Potential impact on benthic species			
	Living Resources: Potential impact on seabirds			
	Living Resources: Potential impact on marine plants			
	% of "Living Resources" risk factors (X (red) = some to high risk)	0%	0%	0%
18.75%	Livelihood: Potential interruption of fisheries/harvesting			
	Livelihood: Potential interruption of marine traffic			
	Livelihood: Potential interruption of recreation or tourism			
	% of "Livelihood" risk factors (X (red) = some to high risk)	0%	0%	0%
18.75%	Cultural: Potential interruption of cultural sites access			
	Cultural: Potential interruption of traditional use activities			
	Cultural: Potential damage to cultural sites			
	% of "Cultural" risk factors (X (red) = some to high risk)	0%	0%	0%
100%				

✓ (green) = low/no risk
 X (red) = some to high risk

Feasibility/Suitability (Success Factors) Score	0.0%	0.0%	0.0%
Risk Factors Score	0.0%	0.0%	0.0%
Risk/Success Ratio	#DIV/0!	#DIV/0!	#DIV/0!

The higher the score, the better
The lower the score, the better
The lower the ratio, the better

Automatic NO-GO	?	?	?
Overall Assessment			

Automatic, based on Space/Depth consideration
 Subjective, based on expert assessment of Success and Risk factors and Risk/Success Ratios

In this table, the RA Team conducts a rapid Risk Assessment process

- COA names will be carried forward to column C.
- The RA Team scores the Probability and Consequence for the 3 different outcomes: minor discharge and/or disruption of maritime activity at POR; ship sinking or grounding enroute POR; major discharge, explosion or ship emitting toxic fumes at POR (see **Key to Risk Score** on the right).
 - Minor discharge refers to a spill or discharge that, due to its small quantity, the nature of the substance and the likelihood of recovery, could result in a lesser environmental impact than a major discharge.
 - Major discharge is a spill or discharge that, because of its large quantity, the hazardous nature of the substance, and the low probability of recovery, could have a significant impact on the environment.
- The Risk Score for each outcome is calculated in column J to L (the lower the score, the better). *The risks scores are the results of Probability x Consequence* (see **RISK MATRIX** on the right to determine the risk level: **Low; Medium or High**)
- The Success and Risk Factors scores and the Risk/Success ratio are brought forward from step 2 in columns N to X to allow further comparison with the Risk Scores of the 3 different outcomes (see Score Summary/Dashboard).
- The Best Option is selected by inspection and debate: Which COA offers the best chance of Success with the lowest Risk?
- Space is provided for clarifying or explanatory comments at columns AA-AC.
- Space is provided in row 23 to insert details of mitigation or control measures to reduce risk to as low as reasonably practicable (ALARP) for the chosen COA or to record key factors if Refuse POR is the chosen COA.

Low Risk Medium Risk High Risk

Probability		Consequence
Almost Certain	5	Catastrophic
Probable	4	Very Serious
Possible	3	Serious
Unlikely	2	Moderate
Improbable	1	Negligible

RISK MATRIX		Extreme	Very High	High	Medium	Low
		Highly probable	25	20	15	10
Probability	Probable	20	16	12	8	4
	Possible	15	12	9	6	3
	Unlikely	10	8	6	4	2
	Improbable	5	4	3	2	1

COA #	Course of Action name (site name)	Probability of minor discharge and/or disruption of maritime activity at POR	Consequence of minor discharge and disruption of maritime activity at POR	Probability of ship sinking or grounding enroute POR	Consequence of ship sinking or grounding enroute POR	Probability of major discharge, explosion or ship emitting toxic fumes at POR	Consequence of major discharge, explosion or ship emitting toxic fumes
1	Refuse POR/leave ship offshore						
2		0					
3		0					
4							
5		0					
6							

Risk score of minor discharge and/or disruption of maritime activity at POR	Risk score of ship sinking or grounding enroute POR	Risk score of major discharge, explosion or ship emitting toxic fumes at POR	% of Success Factors (Total)	% of Success Factors (Geography)	% of Success Factors (Navigation)	% of Success Factors (Response)	% of Success Factors (Resources)	% of Risk Factors (Total)	% of Risk Factors (Material)	% of Risk Factors (Human health)	% of Risk Factors (Living resources)	% of Risk Factors (Livelihood)	% of Risk Factors (Cultural)	Risk/Success Ratio	Best Option? (Y/N)	Comments
0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	#####		
0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	#####		
0	0	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%	100.0%	100.0%	100.0%	#####		

Chosen Course of Action

Mitigation or control measures

--	--