

## Appendix K

### WEST COAST OFFSHORE VESSEL TRAFFIC RISK MANAGEMENT RELATIVE RANKING/RISK INDEXING WORKSHEET

#### 1. Volume of Oil/Vessel Design Factor

Ship Type	Risk Credit Scoring	Notes
Laden Tanker (single hull)	10	* Those vessels with double propulsion <u>and</u> steering systems (applies to all cruise ships and includes tug & tow) shall get a "credit" of negative two points to be added to their Risk Factor Value determined above.
Laden Barge (single hull)	9	
Tanker (ballast, single hull)	8	
Large Cargo/Passenger (single hull)	7	
Large Fishing Vessel (single hull)	6	
Laden Tanker (double hull)	5	
Laden Barge (double hull)	4	
Tanker (ballast, double hull)	3	
Large Cargo/Passenger (double hull)	2	
Large Fishing Vessel (double hull)	1	
* Redundant Propulsion & Steering Systems	-2	

#### 2. Drift Factor

Drift Rate of the Ship	Risk Credit Scoring	Notes
High Surface Effect (8~10% of wind spd)	10	Cruise ships & most cargo vessels <u>generally</u> have a high surface effect, fishing vessels medium & laden tankers medium to low.
Medium Surface Effect (5~7%)	6	
Low Surface Effect (2~4%)	2	

#### 3. Higher Collision Hazard Factor

Areas Causing Re-routing	Risk Credit Scoring	Notes
Known areas where vessels are not simply transiting between ports, crossing traffic lanes due to operation, e.g. engaged in fishing, dredging, etc.	10	If more than one factor applies, choose the highest.
Transition/Intersecting Zones	9	
Lightering Areas (San Diego)	7	
Drill Rig Platform Areas (AK, CA)	5	
Areas to be Avoided	3	
Cruise Ship Loitering Areas (San Diego)	2	
Military Op Areas (e.g. Ranges)	1	

#### 4. Distance Offshore Factor

Distances Offshore	Risk Credit Scoring	Notes
3 ~ 12 nm	10	* If location of the scenario is within one of the routing measures already in place to reduce risk as listed, apply the negative value to “lower” the risk value. If two negative values apply, apply the higher value (lower negative number), i.e. the negative numbers are not to be cumulative.
13 ~ 15 nm	9	
16 ~ 20 nm	8	
21 ~ 30 nm	6	
31 ~ 40 nm	5	
40 ~ 50 nm	4	
Greater than 50 nm	1	
* Tanker Exclusion Zone (BC) <u>or</u> Shipping Safety Fairways (PWS & Unimak)	-1	
* VTS Op Areas/TSS Area; 25 nm AWO Tank Barge Track; 50 nm ANS Crude Oil Track (WSPA); <u>or</u> MBNMS Recommended Tracks	-2	

#### 5. Weather/Seasonal Factor

Weather/Seasons	Risk Credit Scoring	Notes
Winter (Alaska, British Columbia)	10	Each scenario should have all four seasons covered.
Winter (Oregon, Washington, Nor Cal.)	9	
Winter (Southern California)	8	
Autumn/Spring (AK, BC)	8	
Autumn/Spring (OR, WA, Nor CA)	7	
Autumn/Spring (Southern California)	5	
Summer (AK, BC)	4	
Summer (OR, WA, Nor CA)	2	
Summer (Southern California)	1	

#### 6. Tug Availability Factor

Tug Availability (@ 10kt avg. Speed)	Risk Credit Scoring	Notes
2 or more days	10	Refer to the Assist Vessel Response Time Contour Maps (Appendix H of the Report).
Up to 1 1/2 days	8	
19 ~ 24 hours	6	
13 ~ 18 hours	4	
7 ~ 12 hours	2	
6 or less hours	1	

## 7. Coastal Route/Density Factor

Transits Over One Year Period	Risk Credit Scoring	Notes
Over 5000 vessel transits	10	* Scenario should be in one of the nine coastline sections listed below, then apply the appropriate traffic density total.
4000 ~ 4999 vessel transits	7	
3000 ~ 3999 vessel transits	5	
2000 ~ 2999 vessel transits	3	
Less than 2000 transits	1	

\* Total transits by section are based on Vessel Arrival data (Appendix D):

- 1) Alaska Coastline to BC = 2211 annual transits
- 2) BC coastline between AK and Juan de Fuca = 2527
- 3) Juan de Fuca to Grays Harbor = 4221
- 4) Grays Harbor to Columbia River = 4188
- 5) Columbia River to Coos Bay = 3694
- 6) Coos Bay to Humboldt Bay = 3658
- 7) Humboldt Bay to San Francisco Bay = 3668
- 8) San Francisco to LA/LB = 4604
- 9) LA/LB to San Diego = 2615

## 8. Historical Casualty Factor

Total # of Casualties / # of Vsl Transits	Risk Credit Scoring	Notes
Fishing Vessel (0.384%)	10	* See below.
Oil Tanker (0.091%) and Oil Barge (0.074%)	3	
Cargo Ship & Misc. vessels (0.054%) and Passenger Ships (0.024%)	2	
Cargo (Freight) Barge (0.019%)	1	

\* Note that our data collected an eight-year casualty record (1992~1999) while we only have a one-year vessel transit record (summer of 1998 to summer of 1999), therefore, the number of casualties was divided by eight to obtain a rough average of the yearly vessel casualties. This number was then used to divide into the number of transits of individual vessel types to calculate the percentages of casualty rates. Highest casualty rate being 0.384% (factor value of 10) with lowest at 0.019% (factor value of 1), the values in between were assigned proportionately.

## 9. Environmental Sensitivity Factor

Shorelines	Range of Factor Values	Notes
<b>Higher Risk</b>	--	* A "Point of Concern" refers to those areas that will have more of an environmental impact than other shoreline, for example in vicinity of bays & rivers due to their sensitivity threshold.
- Offshore areas of nat'l significance, e.g. U.S. Marine Sanctuaries and Canadian Marine Nat'l Parks	10	
- 50 nm from point of concern*	8	
<b>Average Risk</b>	--	
- 50 nm from shore	6	
<b>Lower Risk</b>	2	

## Relative Ranking Scoring Scheme

<b>Degree of Risk</b>	<b>Score</b>
Less/Lower Risk	Less than or equal to 36 points total
Average/Medium Risk	Between 37 ~ 52 points total
More/Higher Risk	Greater than or equal to 53 points total