

## Appendix M

### **PUBLIC COMMENTS ON THE DRAFT FINDINGS AND RECOMMENDATIONS OF THE WEST COAST OFFSHORE VESSEL TRAFFIC RISK MANAGEMENT PROJECT WORKGROUP With Responses from the Project Workgroup**

#### **I. Public Outreach Schedule December 2001- March 2002**

- 12/6/01: ALASKA Regional Response Team (ARRT)
- 12/7/01: Cook Inlet Regional Citizens' Advisory Council (CIRCAC) Board of Directors
- 12/11/01: US Coast Guard Navigation Safety Advisory Council (NAVSAC)
- 1/9/02: Columbia River Ports and Waterways Safety Committee Meeting (CR PAWSC)
- 1/18/02: Olympic National Marine Sanctuary Advisory Council (OLYNMSAC)
- 1/23/02: San Diego Harbor Safety Committee (SD HSC)
- 1/31/02: NW Regional Response Team and Area Committee (NWRRT)
- 2/5/02: California Oil Spill Technical Advisory Committee (CA TAC)
- 2/6/02: LA Harbor Safety Committee, Los Angeles (LA HSC)
- 2/7/02: Western States Petroleum Association Marine Committee
- 2/13/02: Puget Sound Harbor Safety Committee (PS HSC)
- 2/14/02: San Francisco Harbor Safety Committee, Oakland, CA (SF HSC)
- 2/27/02: Western Marine Community, Pacific Coast Marine Review Panel, Vancouver, British Columbia
- 3/6/02: California Coastal Commission (CCC)
- 3/15/02: American Waterways Operators, Pacific Region (AWO)
- 3/19/02: Canadian Maritime Advisory Council (CMAC)
- 3/20/02: California State Lands Commission Customer Service Meeting (CSLC)
- May,2002: Humboldt Bay Harbor Safety Committee
- Draft Findings and Recommendations were also available on the Pacific States/BC Oil Spill Task Force web site during the outreach period

## II. Public Outreach Comments, organized by Risk Factor Topic, General Comments on the Study, and Other

Comments are bulleted; responses from the Project Workgroup are in italics. Please Note: The full text of all written comments can be found in Section III below; all other comments captured here were verbal comments made at the presentations listed in Section I.

### Regarding the Higher Collision Hazards Risk Factor

- In response to questions, you said that the risk assessment did not take into consideration the increase to risk (of oil spills/accidents/collisions) if B.C. does open up our coast to oil exploration/drilling. (Jerry Hockin, written comment)

*The effect of offshore drilling on the BC coast was not considered because it is not yet a reality. The existence of offshore drilling along the CA coast was factored into the Higher Collision risk factor, so a similar adjustment could be made for the BC coastline, if necessary. In the meantime, we will note the interest in drilling off BC in the Future Projections section under Part III, "Defining the Risk" in the Final Project Report.*

### Regarding the Historic Casualty Risk Factor

- Several verbal comments were made that the study should have considered crew and vessel histories, fuel type carried by vessels, and vessel owner/operator funding issues as part of the risk equation.
- In response to questions, you said that the risk assessment did not take into consideration the age and state of maintenance of vessels (oil tankers, oil barges, or tugs) or the issue of false maritime documents, in crews of vessels with flags of convenience. (Jerry Hockin, written comment)

*The risk assessment considered vessel casualties rates by vessel type, but data on crew histories, owner/operator funding, and fuel types was not available in the historic casualty database. The risk assessment model which the Workgroup developed incorporated data which was available, including vessel design and amount of fuel carried by vessel type. But the risk assessment was not designed to focus on specific vessels or crews so much as on vessel types.*

- How did we include the human element in the risk assessment? How were ISM and STCW factored in?

*We considered the human element in the project report, and also considered the impact of ISM and STCW on human error, but noted in the Historic Casualty Findings that it's too soon to tell whether there will be any reduction in casualties as a result of these international programs.*

- The Fishing Vessel Safety program does not focus on structural integrity issues as much as on human health/safety issues.

*The Workgroup recommends implementation of the US Coast Guard's Commercial Fishing Vessel Safety Action Plan. The eight long-term action items identified in the plan include completing a regulatory project on stability and watertight integrity for certain fishing vessels; improving casualty investigation and analysis; mandatory vessel examinations; and mandatory training-based certificate programs for operators and crews, all of which would help reduce overall fishing vessel casualty rates.*

- Were there any drift casualties in the historic data?

*Among the 96 incidents used by the USCG in the risk assessment, there were 14 engine failures, 15 incidents where a ship was "disabled," and 19 which involved loss of steering, all of which could have ended in a drift grounding. In addition, there were three groundings, but no data is available to indicate whether these vessels drifted aground. The Workgroup noted that the drift routes of the bow of the M/V New Carissa and the M/T Atigun Pass provide further examples of what might occur when vessels drift during worst case wind events.*

- In response to questions, you said that the risk assessment did not take into consideration the availability of oil-spill clean-up equipment and supplies. (Jerry Hockin, written comment)  
*It is not appropriate for a spill prevention study to include the availability of spill response equipment, although the costs of response were reviewed in the study as part of the economic consequences of a spill. It is worth noting that, thanks to regulations adopted by the West Coast states, all larger non-tank vessels, as well as all tank vessels operating in state waters must be covered by contingency plans and contracts with spill response organizations. All vessels, both tank and non-tank, over 400 gross tons operating in Canadian waters must have contracts with a spill response organization and carry a Shipboard Oil Pollution Emergency Plan (SOPEP). In addition, all tank vessels in US territorial waters must be covered by contingency plans and contracts with spill response organizations.*

### Regarding the Tug Availability Risk Factor

- Recheck the number of tugs in Prince William Sound; commenter says there are 10, not seven. *The Workgroup recognizes that the tug inventory used for this study is a snapshot in time, and that the number of tugs home-ported in each West Coast port will change somewhat over time. They are confident, however, that the relative distribution of tug populations will remain constant over the next few years. Since they used only ports with a substantial tug population for the risk assessments, the Workgroup felt that the inventory data will be adequate.*
- Our risk projections assume availability of a tug in Neah Bay. *The risk assessments specifically did NOT include the rescue tug at Neah Bay, since the Workgroup is aware that this tug is part-time and potentially temporary until funding issues are resolved.*
- Two comments were made expressing concern regarding who pays for rescue tugs and whether a dedicated rescue tug is necessary. Another commenter suggested that there should be a dedicated tug stationed in the Queen Charlotte Islands area of British Columbia. *The Workgroup estimated that the annual operating cost of a dedicated tug would be approximately \$2, 555,000, based upon the \$7000/day cost for the tug at Neah Bay, Washington, which is only on station during the winter months. The State of Washington has recommended that the federal government assume costs of this tug. The Workgroup is recommending that a dedicated tug be considered as one alternative among several which a local or federal government could consider if tug availability risk is high in a specific area.*
- Was the possibility of rescue by vessels other than tugs considered? *It was discussed, but the Workgroup recognized that the primary focus of any intervention by other vessels would be on crew safety more than vessel safety. Moreover, the availability of passing vessels is too uncertain to include as a risk variable.*
- There are also the issues of only one tug capable of responding, in heavy weather, for rescue purposes, between Washington State and Alaska. If that one tug was already involved in some other work, the whole coast of BC, with one of the longest coast lines in the world, would be at increased risk, as any rescue tug would have to travel that much farther. (Jerry Hockin, written comment)  
*The project report indicates that a total of 21 tugs were inventoried in British Columbia ports; of these, four are considered capable of responding in severe weather conditions. In addition, there is a higher volume of working tugs transiting in between Puget Sound and Juneau than on any other section of the West Coast, according to International Tug of Opportunity (ITOS) data.*
- On the issue of setting up a fund for standby tugs, I would be totally opposed to the use of tax dollars for subsidizing what is a very profitable corporate sector, which can well afford to provide funds of their own. (Jerry Hockin, written comment)  
*A decision to establish a tug stand-by fund is a local political decision based upon a region's level of risk aversion. Funding recommendations were beyond the scope of this project.*

- We are cautious with regard to the International Tug of Opportunity System (ITOS). We agree that having the type of information that ITOS provides is valuable, however given the caveats identified in the report we realize that this is just one spoke in the rescue tug wheel and should be treated as such. (C. Donaldson, written comment)

*The Workgroup agrees, and does treat any coastwise expansion of tug availability information as one element of overall risk reduction to be accomplished by their final recommendations in toto.*

- The (Olympic NMS) Advisory Council believes that oil spills from tankers, tank barges, cargo vessels and large fishing vessels form the greatest single risk from the Columbia River to the north end of Vancouver Island. We recommend more emphasis on the following recommendation to address areas of special concern to the Sanctuary: “Investigate dedicated/stand-by tug/regulatory alternatives.”

*As noted above, the Workgroup feels that the use of these alternatives is a local or federal political decision. The final wording of the recommendation was changed to emphasize that the Workgroup recommends consideration of any or all of these mechanisms if state, provincial, or federal governments wish to reduce the risks associated with tug availability in their regions.*

### Regarding the Distance Offshore Risk Factor

- Smaller boats don’t want to go further offshore during worst case weather; they want to head to refuges along the coastline.

*The Workgroup added a statement to their Distance Offshore Recommendation stating that “Nothing in these voluntary minimum distance offshore recommendations is intended to preclude a vessel master from taking prudent action for the safety of the vessel and its crew.”*

- Changes to the Coast Pilot are easy to implement and available to the mariner electronically. *The Workgroup adopted a recommendation to the US and Canadian Coast Guards that the recommended voluntary minimum distances from shore be communicated to mariners by placing the text of these recommendations in the Coast Pilot for the US West Coast and the Sailing Directions for the Canadian West Coast. Furthermore, they recommended that notes be placed on navigation charts for the US and Canadian West Coasts to reference the Coast Pilot and Sailing Directions, to be repeated at headlands, which indicate the voluntary minimum distances offshore and refer the mariner to the Coast Pilot and Sailing Directions for further details.*

- Consider electronic mapping of distance off shore or any other recommendations that required chart mark up.

*The Workgroup would expect the two Coast Guards to work with the appropriate charting agencies in the US and Canada to find the most expeditious and effective means of communicating its recommendations to mariners, per their recommendations to us the Coast Pilot, Sailing Directions, and notes on charts.*

- I believe therefore, in the interests of protecting the environment, that the minimum distance from shore, of all oil carrying marine traffic, should, instead of the 30 mile from shore zone (aka "Tanker exclusion zone"), that the study favors, should be a minimum of 100 miles. (Jerry Hockin, written comment)

*The Workgroup adopted a recommendation that all tank ships carrying crude oil or persistent petroleum products voluntarily transit at least 50 nautical miles (nm) off the West Coast, except where other management measures such as the Canadian Tanker Exclusion Zone already exist or when entering/departing from ports. The Workgroup further recommended that laden tank barges, tank ships in ballast or carrying non-persistent products, and all cargo, passenger, and fishing vessels 300 GT or larger voluntarily transit a minimum of 25 nm offshore, except where other management measures already exist. The Workgroup did not feel that the study data supported recommendations for transits further offshore.*

- Regarding the distance offshore risk factor, we are more likely to support the recommendation that a minimum offshore distance of 30 nautical miles be maintained in the identified “higher

risk” areas rather than 25 miles from land along the entire West Coast. We would include in this recommendation a caveat with regard to adverse weather conditions such as: ...the workgroup suggests that a minimum offshore distance of 30 nautical miles be recommended for those areas in anticipation of or during adverse weather conditions. (C. Donaldson, written comment)

*Weather was one risk factor used in the development of the “higher risk areas.” These higher risk areas were generally inside a line 25 nm offshore. As noted above, the Workgroup adopted a recommendation that all tank ships carrying crude oil or persistent petroleum products voluntarily transit at least 50 nautical miles (nm) off the West Coast, except where other management measures such as the Canadian Tanker Exclusion Zone already exist or when entering/departing from ports. The Workgroup further recommended that laden tank barges, tank ships in ballast or carrying non-persistent products, and all cargo, passenger, and fishing vessels 300 GT or larger voluntarily transit a minimum of 25 nm offshore, except where other management measures already exist. The Workgroup felt that distance offshore recommendations that varied with weather conditions would be too inconsistent to be good public policy.*

- The Advisory Council supports Minimum Distance Offshore Proposal #1: “25 nm voluntary minimum distance for entire coast and show Higher Risk areas on charts and publications.” In any case, display of minimum distance offshore on the charts is essential to the effective implementation of either proposal. (Olympic National Marine Sanctuary Advisory Council, written comment)

*Please reference replies to the previous comments above.*

#### Regarding the Study Design/Data/Process

- Although we don’t include the Inside Passage in the study, it should extend to the BC coastline around the Queen Charlotte Islands, where it’s actually exposed to the open ocean.

*The study did treat that area as open ocean, since the tug response time analysis used the closest point of land, which in this case, was inside the Inside Passage.*

- How absolute are your numbers? What’s the margin of error? Can you estimate risk in terms of probability?

*The risk assessment model shows higher risk areas as based on nine risk factors, not the probability of a casualty occurring. The tool used is called the Relative Ranking/Risk Indexing model, which ranks risk under each of the nine factors and then applied the resultant index to scenarios and extrapolated these over a wide geographic area to develop the “higher risk” areas.*

- How reliable is the casualty data?

*As reliable as the information put in, and that does leave gaps with regard to causes and outcomes, thus our final recommendations regarding improvements to databases address these problems.*

- Why were collision risks included in the study if the primary focus was on preventing drift groundings?

*The project goal was expanded by the Workgroup at their first meeting, in recognition of the fact that collisions are a component of offshore risks which had to be considered in the design of the risk assessment as well as the final recommendations.*

- MSIS data doesn’t include foreign-flag vessel casualties unless they occur within the territorial sea of US or Canada (12 nautical miles).

*This is true, so the reported casualty figures we had to work with are conservative.*

- The shoreline should start further out to include sea stacks off Olympic National Marine Sanctuary (NMS) coast.

*The study overall was focused on the offshore, which we defined as 3 to 200 nm from shore. Some of the Olympic NMS coastal features are further offshore than 3 miles, and would have been included in this study area. The Tug Availability model would not have included environmental*

features, however, since used drift rate and tug speed of advance from its homeport. The Relative Ranking/Risk Indexing model did include environmental sensitivity as one factor, so this area would have scored high based upon its National Marine Sanctuary designation, thus increasing the emphasis on it being a higher risk area.

- Drift rates are directly east to west and don't conform to land shapes.

*Drift contours in the tug availability risk assessment do conform to land shapes. The drift rates include the onshore wind component, with a 22 degree variable north to south. But the wind data, like all data in the study, is taken at a macro level and doesn't consider local variables.*

- There was insufficient environmental participation on the Workgroup.

*The Workgroup regrets that, of the four public interest environmental organizations invited to participate as Workgroup members, only two were able to provide representatives over the full three year span of this project. We understand that public interest groups may have fewer staff and other resources to assign to such projects, and therefore must prioritize their involvement. We rotated our meetings between West Coast locations in order to enhance participation opportunities for members, and we varied between meetings and conference calls for the same reason. In addition, we have made interim reports available annually, and scheduled extensive public outreach after development of the draft findings and recommendations. It should be noted that representatives from state and federal public agencies also represented the public interest. Fully participating agencies included the US and Canadian Coast Guards, NOAA (both Hazmat and National Marine Sanctuaries), the BC Ministry of Water, Land, and Air Protection, the Washington Department of Ecology, the California Office of Spill Prevention and Response, and the California Coastal Commission. The Alaska Department of Environmental Conservation, the Oregon Department of Environmental Quality, and the Transport Canada also monitored the project and/or participated as possible based upon their resource availability.*

- Did the salvage community participate on the workgroup? (NW RRT)

*West Coast tug companies with rescue tug assets were represented by Jerry McMahon of AWO, but salvage vessel operators not members of AWO were not. Our focus was on rescue tugs to prevent groundings requiring salvage.*

- Did vessel masters participate on the workgroup? (NW RRT)

*Yes, a number of our Workgroup members have been or still work as vessel masters.*

- Did the Navy and SUPSALV participate? (NW RRT)

*The US Navy was represented by Sven Eklof and the Canadian naval forces by LT Jon Treen, but SUPSALV was not formally represented. As noted above, our focus was on rescue tugs to prevent groundings requiring salvage.*

- One commenter questioned why a large fishing vessel ranked above a double hulled tanker on the worksheet for "Volume of Oil/Vessel Design Factor."

*Under this risk factor, the Workgroup defined the risk as the vessel going aground and the hull being breached in such a manner that oil leaked out. If the oil didn't leak out it wouldn't matter how much the vessel was carrying, so we considered single hulls as more likely to be breached than double hulls.*

- Were any representatives from Humboldt Bay involved in the project?

*Not directly; their interests were intended to be represented by the California representatives.*

- Was the Port Hueneme Harbor Safety Committee given a presentation?

*The Director of Port Hueneme attended the California Coastal Commission presentation. He declined an offer for a presentation at Port Hueneme (which has no active Harbor Safety Committee), but was provided with copies of the Interim Report and full text of the draft Findings and Recommendations.*

- The study didn't seem to assign a risk "value" to single hull oil barges; which is most, if not all, of the present oil barges in BC (Jerry Hockin, written comment)

*A laden barge, single hull is ranked a 9 out of a possible 10 on the risk scoring worksheet.*

- It would be helpful to have information on the number of tankers not covered [by the WSPA agreement] to illustrate the risk and need for universal compliance. We recommend the Task Force gather that information as soon as possible and add it to the report. (Olympic NMS Advisory Council written comment)

*The Workgroup discussed this suggestion, but it was made moot by their final recommendation that all tank ships laden with crude oil or persistent petroleum products voluntarily stay a minimum distance of 50 nm offshore, which is the essence of the current WSPA agreement. Now all non-WSPA tank ships will be subject to the same voluntary paradigm.*

- Putting a [helicopter] system similar to the Columbia River Bar Pilots and Gray's Harbor Pilots at every port in the United States would be the most dramatic and cost effective way to keep the oil off of the beaches ever devised. Rotterdam has had this in place since 1986 with zero defects, and they are the busiest port in the world. I think your task force skipped over this terrific advance in their study. (Captain Worth, Columbia River Bar Pilots, written comment)

*For the purpose of this study, the relevance of access to disabled vessels via helicopter seems to be a larger issue than whether that helicopter is operated by a pilot organization or the Coast Guard. Moreover, access to the vessels was not our focus, since putting people on a disabled vessel doesn't necessary stop its drift, which is our focus. Our study assumed that drifting vessels already have crew on board, and that this crew has failed to stop the vessel drift.*

- Regarding the Tug Response Time Analysis, one commenter submitted the following: I have two concerns related to how the authors define these scenarios. First, the "Average Case" is based upon average wind speeds over a ten to fifteen year period. To the extent that vessels are more likely to be disabled in poor weather conditions, this "average case" may not be typical of the average conditions under which an at-sea casualty occurs. If this is true, the average case is overly optimistic. Second, both the worst case and average case scenarios assume the same speed of advance for the assisting tug. If weather conditions are related to both (a) the "drift speed" of the disabled vessel and (b) speed at which the assisting tug is able to travel, then the "worst case" and "average case" scenarios should be based on different assumptions about the speed of advance of the tug. This may result in extending the worst case risk zone farther from shore. If the above issues have merit, simple adjustments could be performed while still working within the general modeling framework adopted by the authors of the report. These might include:

1. Using wind speed data for the "average" scenario that correspond to the typical conditions under which an at sea casualty occurs. If insufficient data exists to make these adjustments, then the term "average" should be used with caveat.
2. Varying the tug speed of advance in the worst case versus average case scenario. It is important to note that the above changes would not change the complexity of the model mechanics, and therefore, all the authors' caveats regarding model simplicity still apply.

*As you suggested, we will make it clear that our examination of Tug Response Time is a time-distance examination only and not a probabilistic analysis of the tug reaching its destination. Further, we agree with your comment regarding no tug response. In some cases, the tug would not be able to respond at all due to wind and sea conditions, as well as shallow water wave conditions at the entrance to some harbors. Lowering the Speed of Advance (SOA) of the tug was examined. As you point out lowering the SOA will move the "safe envelope" even further offshore incrementally to the worst case where the tug does not respond at all. As stated in our report the worst case scenarios are based upon onshore wind speeds that occur .1% of the time over a 10 to 15-year period (40 kts. in the case of Alaska). However, we believe that our SOA of 10 knots is still reasonable for the simple graphical analysis we had in mind. A speed of 10 kts. varies between 71-83% of the tugs maximum speed. We re-examined the data to determine if vessels are more likely to be disabled in poor weather conditions. While this thought may have intuitive appeal*

*the data we have gathered does not support this relationship. The only apparent trend we noted was the propensity of casualties in the vicinity of major ports which we believe is unrelated to weather.*

- Regarding the Risk Index Model, the same commenter noted that:  
First, while an additive index has intuitive appeal, it is in conflict with the authors' initial definition of "risk": the probability of an event occurring *multiplied* by the consequence of that event. With the authors' *additive* risk index, the relative importance of the "probability of event" versus "consequence of event" is distorted. It includes eight elements that affect the probability of an adverse environmental consequence (i.e., vessel types, drift, collision, offshore distance, weather, tug availability, traffic, historical casualties) but only one item that describes the magnitude of that environmental consequence (i.e., environmental sensitivity). This suggests that the magnitude of the negative consequence is only worth about 1/9 of the index, while it would conceptually be worth 1/2 the "risk value" (very loosely speaking) in a typical risk model. This problem may be compounded, as there appears to be little variation in the authors' "environmental sensitivity" component. In sum, the index does not provide much insight into "risk", but rather the "probability" of an adverse outcome (independent of its severity).  
Second, the strict additive index ignores the interrelationship between "risk factors". In the risk index, the contribution of one risk factor is the same regardless of the values assigned to the other factors. For example, consider the following two elements of the risk index: "distance off-shore" and "tug availability". According to the model, a point that is 5 nm off-shore and 2 days from a tug receives a risk contribution of 20 from these two risk factors. A point that is 5 nm off-shore and 15 hours from a tug receives a risk contribution of 14 from these two factors. However, even though these risk scores are quite a bit different (a 30% reduction in the index as you move farther from shore), there may be very little variation in the probability of a casualty (i.e., the tug may not be able to reach an offshore casualty in time to stop grounding because of the close proximity to the shore in both cases). This type of problem is inherent in the formula used for index construction. Third, the relative importance placed on the various inputs is based upon the informed experience of participants in the project. While this type of information is useful for assessing risk in offshore vessel traffic, it is associated with a certain degree of uncertainty. In my opinion these data are strongest for assessing the types of information that belong in a risk model. It is not as reliable for assessing the relative contribution of various factors to risk, although it is sometimes the best information available (and therefore should be used for this purpose with the appropriate caveats). This data source is problematic for examining potential interactions between risk factors, as there is a daunting number to consider. This may be one reason why these factors are left out of the risk index. In sum, little discussion is included on the limitations of these sorts of data, and no instruction in how the model should (and should not) be applied to help practitioners interpret its output. Based upon my assessment of the construction of the risk index, I suggest the following strategies for making the model more useful:  
1. Spend more time interpreting/ground-truthing index. Because of the uncertainty in the input data and the potential limitation of an additive index, the value of the analysis does not reside in the model output, per se (i.e., the maps do not "speak for themselves"). Rather, the value is in the discussion of the process that leads to the output. This includes interpretation of how the results for a specific scenario (e.g., fishing vessels of the coast of California) depended on various assumptions. At a minimum, the authors should include brief discussions describing the output of each risk scenario map (presented in Appendix L), including answers to the following questions:  
    Why do certain areas off the coast appear to be relatively low risk for specific vessels?  
    Why are other areas relatively higher risks?  
    Does the output have face validity (i.e., does it have intuitive appeal); and are there important interactions between risk factors that may be overlooked for the specific scenario?

Not only would this provide a fuller description of the model, but it would help instruct the reader on how the model might be appropriately applied to examine risk. This would require much more description than currently presented, and may be more appropriate for a final report.

2. Simplify the risk index where possible. Since the output of the risk model requires considerable interpretation in order to be meaningful, the risk index should be simplified where possible. At a minimum, the environmental sensitivity risk factors should probably be removed, as it does not appear to be serving its intended purpose. It is important to stress that the value of this report is in its exploration of risk situations rather than the output of the model in a specific case. It is my opinion that application of this model to specific cases should be done with great care, and that it should only be used in conjunction with other information that provides situation-specific validation of the model results.

*We are in agreement with your assessment of the pros and cons of the “Risk Index” model the study group chose. Throughout the group’s deliberations we reminded ourselves continuously that this was a relative risk model and not an absolute one. As the title of our project states, this project is confined to “Offshore Vessel Traffic” and does not address inshore, harbor, or port entry traffic patterns which, generally speaking, are more congested from a traffic and geographic standpoint. The indices in the model have eight indices that address the probability of an adverse outcome. In retrospect, the mind-set of the group was “Prevention” or lowering the probability of an adverse event. Additionally, the group had extreme difficulty dealing with the Environmental Sensitivity Index. There was a general reluctance to rank any of the North America Western Coastline lower than the maximum value of 10. Even after much debate, the range the group agreed to was very small and consequently, of little value in distinguishing more sensitive areas from others. While the intent of the group was to emphasize the importance of the “consequences of an event (oiled coastline)”, the model may have understated that element. We believe that Appendix L does have sufficient numerical detail to interpret the dominant factors in each of the scenarios. We do agree that a discussion of the process that led to the outputs would be beneficial.*

### Regarding Miscellaneous Other Topics

- One commenter noted that the maritime industry should work with the Task Force and Coast Guards to conduct a drift study.

*The Workgroup considered making a recommendation for further drift studies, but decided to investigate the nature of drift models currently used by the Search and Rescue programs of the US and Canadian Coast Guards in order to determine whether such a study would indeed be necessary.*

- Should a towing package be included on non-tank vessels?

*Our focus was on getting a rescue vessel to a drifting ship to stop the drift, not necessarily to get a line on the drifting vessel. Appendix I of the Final Project Report captures the equipment and procedures necessary for vessel rescues.*

- Will the outcome require a bilateral agreement between US and Canada? (CMAC)

*No bilateral agreement is anticipated, simply continued cooperation and coordination to implement the Workgroup’s recommendations.*

- A joint investigation project between the Canadian Coast Guard, U.S. Coast Guard and the Task Force members; and west coast tanker operators, tug and barge operators, dry cargo vessel operators, commercial fishing interests, and pilots was suggested. The investigation would look into the causes of vessel incidents and casualties on the west Coast of the United States and Canada 1996 - 2001. This project should be completed in a manner to compliment the West Coast Vessel Routing project, and would entail a summary level investigation into the causes of vessel incidents that have occurred over the last 5 years on the west Coast. Particular focus should be on actual casualties and on incidents that can lead to groundings (including propulsion losses, steering failures, tow wire failures,

navigational errors), collisions and allisions. Benefits should include improved data collection, improved spill prevention, and pressing forward on strengthening multi-organization partnerships.

*A study of this nature was included in the Workgroup's final recommendations on improving available data.*

### III. Written Comments

#### Email Comment received from Jerry Hockin, Safety Rep., ILWU Local 400, Vancouver, BC:

I attended the regional CMAC meeting, at BCIT (n.Van), on March 19/02, and am writing to comment on the draft report that you presented. I believe that this report has a number of major weakness/flaws, in its risk assessment.

In response to questions, you said that the risk assessment did not take into consideration:

- the age and state of maintenance of vessels (oil tankers, oil barges, or tugs);
- the availability of oil-spill clean-up equipment and supplies;
- the increase to risk (of oil spills/accidents/collisions) if B.C. does open up our coast to oil exploration/drilling; or
- the issue of false Maritime documents, in crews of vessels with flags of convenience;

I believe that without considering all factors of risk that this study is useless. There are also the issues of:

-only one tug capable of responding, in heavy weather, for rescue purposes, between Washington State and Alaska. If that one tug was already involved in some other work, the whole coast of BC, with one of the longest coast lines in the world, would be at increased risk, as any rescue tug would have to travel that much farther.

-the study didn't seem to assign a risk "value" to single hull oil barges; which is most, if not all, of the present oil barges in BC;

I believe therefore, in the interests of protecting the environment, that the minimum distance from shore, of all oil carrying marine traffic, should, instead of the 30 mile from shore zone (aka "Tanker exclusion zone"), that the study favors, should be a minimum of 100 miles.

On the issue of setting up a fund for standby tugs, I would be totally opposed to the use of tax dollars for subsidizing what is a very profitable corporate sector, which can well afford to provide funds of their own.

#### Comments received from Charles W. Donaldson, Manager, Emergency Management and Site Assessment Section, Land Quality Division, Oregon Department of Environmental Quality:

After reviewing the Public Comment Draft of Findings and Recommendations of the West Coast Offshore Vessel Traffic Risk Management Project Workgroup, the Oregon Department of Environmental Quality has the following observations and recommendations:

- ◆ Many of the recommendations encourage continuation of current practices, encourage successful practices in certain ports be examined by other ports, or encourage expedited implementation of planned improvements to the current system. We generally agree with these recommendations.
- ◆ A national or regional standard for ballast water management would be beneficial.
- ◆ That the overall rate of casualties per transits for cargo/freight vessels at 0.054% is indicative of an overall success in the system. No major changes are recommended.
- ◆ We are cautious with regard to the International Tug of Opportunity System (ITOS). We agree that having the type of information that ITOS provides is valuable, however given the caveats identified in the report we realize that this is just one spoke in the rescue tug wheel and should be treated as such.

- ◆ Regarding the distance offshore risk factor, we are more likely to support the recommendation that a minimum offshore distance of 30 nautical miles be maintained in the identified “higher risk” areas rather than 25 miles from land along the entire West Coast. We would include in this recommendation a caveat with regard to adverse weather conditions such as: ...the workgroup suggests that a minimum offshore distance of 30 nautical miles be recommended for those areas in anticipation of or during adverse weather conditions.

#### Comments received from Capt. William Worth, Columbia River Bar Pilots

I was reviewing your Findings and Recommendations of West Coast Offshore Traffic Risk Management Project Workgroup findings today and wanted to update you on our helicopter project on the Columbia River Bar.

The Columbia River Bar Pilots have now completed over 6000 ship operations in the last two and a half years and have proven without a doubt the ability of the helicopter to deliver ships pilots in all weather up to force 11. We are now working ships in worse weather than we have ever been capable of in the past, 15 miles further to sea, almost out of sight of land.

Without a doubt the ability to put a salvage crew on board the Supertanker ATIGUN PASS, saved the Willapa Bay Estuary from significant environmental harm this winter when the ship got within 12 hours of going aground. We have now expanded the protective envelope that the helicopter provides to include the Port of Grays Harbor, Washington.

Without any cost to the people of Oregon or Washington, this project is funded from the foreign ships who call on the river; we have instituted the most progressive safety advance in the history of the Bar Pilots. Putting a trained USCG Unlimited Tonnage Master Mariner on board these ships, is the best way to insure that they are thoroughly evaluated before we allow them to get in harms way.

The legislature's of both Washington and Oregon have made resolutions praising this advance in the protection of their coasts, and acknowledge that we have seriously lowered the risk of another NEW CARISSA or EXXON VALDEZ type of accident. This has been done with a lot of complaints from the foreign shipping agents in Portland who have told us in sworn testimony that "cost is everything". It has also been said to the Bar Pilots that "safety is the Buzzword of the eighties". Fortunately we have persevered and now have a system in place that protects all of us from a maritime disaster.

Putting a system similar to the Columbia River Bar Pilots and Gray's Harbor Pilots at every port in the United States would be the most dramatic and cost effective way to keep the oil off of the beaches ever devised. Rotterdam has had this in place since 1986 with zero defects, and they are the busiest port in the world.

I invite you to come down some time to see just what we are doing down here on the "graveyard of the Pacific", as I think your task force skipped over this terrific advance in their study.

Comments received from the Olympic National Marine Sanctuary Advisory Council:

Cover letter:

Dear Ms. Cameron:

I am pleased to pass along the enclosed letter from the Olympic coast National marine Sanctuary Advisory committee. The letter comments upon the "Report and Recommendations for the West coast Offshore Vessel Traffic Risk Management Project" undertaken by the Pacific States/British Columbia Oil Spill task Force.

The letter acknowledges the good work and information created by the Project and makes several recommendations for improving the Report. I fully concur with the recommendations of the Sanctuary Advisory Council.

Thank you for taking the time to make an excellent presentation before the Sanctuary Advisory Council on the Project. Please inform us of the final recommendations from the Task Force.

Sincerely,  
Carol Bernthal, Superintendent  
Olympic Coast National Marine Sanctuary

Letter from the Sanctuary Advisory Council:

Carol Bernthal, Superintendent  
Olympic Coast National Marine Sanctuary  
138 West First Avenue  
Port Angeles, WA 98362

Subj: Comments on Report and Recommendations of the West Coast Offshore Vessel Traffic Risk Management Project

Dear Ms. Bernthal:

The Olympic Coast National Marine Sanctuary Advisory Council is please to comment on the Report and Recommendations of the West Coast Offshore Vessel Traffic Risk Management Project. We ask that you forward on our comments to Ms. Jean Cameron of the Pacific States/British Columbia Oil Spill Task Force. The extensive work completed by the project workgroup has produced much valuable information and identified several serious areas of risk. While supporting the report, we recommend more emphasis on the following recommendations to address areas of special concern to the Sanctuary:

"Investigate dedicated/stand-by tug/regulatory alternatives."

The Advisory Council believes that oil spills from tankers, tank barges, cargo vessels and large fishing vessels form the greatest single risk from the Columbia River to the north end of Vancouver Island. Please refer to the enclosed letter from the Advisory Council to the Washington State Legislature, supporting a tug at Neah Bay (see below).

"Expand the Western States Petroleum Association (WSPA) and the American Waterways (AWO) Agreements."

Most tankers are not covered by the WSPA Agreement. It would be helpful to have information on the number of tankers not covered to illustrate the risk and need for universal compliance. We recommend the Task Force gather that information as soon as possible and add it to the report.

In addition, the Advisory Council supports Minimum Distance Offshore Proposal #1: "25 nm voluntary minimum distance for entire coast and show Higher Risk areas on charts and publications." In any case, display of minimum distance offshore on the charts is essential to the effective implementation of either proposal. For clarification, we understand that this recommendation applies to tankers, tank barges, cargo, passenger vessels, and fish vessels in transit 300 gross tons and larger.

The Sanctuary Advisory Council thanks the workgroup for the opportunity to comment on your report.

Sincerely



Alan Brooks  
Chair

Referenced letter from the Advisory Council to the Washington State Legislature, supporting a tug at Neah Bay:

The Honorable Gary Locke, Governor  
Office of the Governor  
PO Box 40002  
Olympia, WA 98504-0002

The Honorable Sid Snyder, Majority Leader  
Washington State Senate  
P.O. Box 40419  
Olympia, WA 98504-0419

The Honorable Frank Chopp, Speaker  
Washington State House of Representatives  
PO Box 40600  
Olympia, WA 98504-0600

Dear Governor Locke, Senator Snyder, and Speaker Chopp:

The Olympic Coast National Marine Sanctuary Advisory Council believes that a major oil spill, either in the western Strait of Juan de Fuca or on the out coast of Washington, is the greatest single threat to the irreplaceable natural resources that the Sanctuary protects. Oil spill response effectiveness in the Sanctuary is particularly challenging due to the rugged coastline and relatively high sea state prevalent in the Sanctuary. Therefore, we must do all we can do to prevent oil spills from occurring in the first place. The Neah Bay rescue tug has proven its value in preventing oil spills, particularly in the last few months. A dedicated vessel is necessary for this remote area because unencumbered tugs of opportunity are extremely rare west of Port Angeles and vessel casualties are largely unpredictable.

We thank the Legislature for funding the Neah Bay rescue tug through the spring of 2002 and Governor Locke for including funding for the tug in his supplemental budget for Fiscal Year 2003. The rescue tug is vital to protecting the Sanctuary, coastal communities and their tourist businesses, the Olympic National Park with its thousands of visitors annually, and coastal tribal cultures and economies. People live and work in Washington because of the quality of life we

enjoy here. Our natural environment is an essential part of that quality of life. The Neah Bay rescue tug is relatively cheap insurance to help ensure that our quality of life is not diminished by a major oil spill.

Therefore, we strongly urge the State of Washington to take whatever actions are necessary to maintain a dedicated rescue tug in Neah Bay.

Sincerely,



Alan Brooks  
Public Member and Chair

#### Comment received 5/22/02 from Matthew Zafonte to Rick Holly

Ken Mayer asked me to provide you comments on the *West Coast Offshore Vessel Traffic Risk Management Project Interim Report, 2001*. To put my comments in the proper perspective, it is important to note that I do not have any specific substantive expertise in offshore vessel traffic. I do, however, have a relevant background in statistics, mathematical modeling, along with some academic exposure to risk assessment. Because of my background, my feedback is most useful for assessing methodological issues and assumptions, rather than the substantive details on specific risk factors. For these reasons, I focus on the two models presented in the report: the tug response model and the risk index model. These comments should be consistent with the verbal feedback that I provided last month.

#### **Tug Response Time**

*Overview:* This model explores the offshore distance within which a disabled vessel is in danger of grounding prior to the arrival of tug assistance. The area at risk varies by latitude based upon the relative proximity of ports with assist vessels of sufficient size.

The two model scenarios are:

1. *Worst Case.* The disabled vessel drifts towards shore at 9% of what NOAA estimates as the worst case scenario for the sustained speed of the wind at the given location.
2. *Average Case.* The disabled vessel drifts towards shore at 9% of what NOAA estimates as the average wind speed in the given location.

In both scenarios, the speed the tug traveling to arrest the drift is assumed to be 10 knots.

The authors qualify their results by noting that their goal is to perform a simple graphical analysis,<sup>1</sup> and the general approach seems reasonable as long as the authors' caveats regarding the simplicity of the model are kept in mind.

*Comments:* I have two concerns related to how the authors define these scenarios. First, the "Average Case" is based upon average wind speeds over a ten to fifteen year period. To the extent that vessels are more likely to be disabled in poor weather conditions, this "average case" may not be typical of the average conditions under which an at-sea casualty occurs. If this

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<sup>1</sup> The authors specifically use the term "probability" of assist vessels reaching a disabled vessel at the given location. This language is inaccurate as there is no explicit probabilistic component to the analysis (i.e., it focuses on average wind speeds and average tug speeds. It seems more appropriate to label the model as simply a graphic examination of "zones" of potential threat.

is true, the average case is overly optimistic.<sup>2</sup> Second, both the worst case and average case scenarios assume the same speed of advance for the assisting tug. If weather conditions are related to both (a) the “drift speed” of the disabled vessel and (b) speed at which the assisting tug is able to travel, then the “worst case” and “average case” scenarios should be based on different assumptions about the speed of advance of the tug. This may result in extending the worst case risk zone farther from shore.

*Suggestions:* If the above issues have merit, simple adjustments could be performed while still working within the general modeling framework adopted by the authors of the report. These might include:

1. Using wind speed data for the “average” scenario that correspond to the typical conditions under which an at sea casualty occurs. If insufficient data exists to make these adjustments, then the term “average” should be used with caveat.
2. Varying the tug speed of advance in the worst case versus average case scenario. It is important to note that the above changes would not change the complexity of the model mechanics, and therefore, all the authors’ caveats regarding model simplicity still apply.

### **Risk Index Model**

*Overview:* The risk index model presented by the authors characterizes risk by summing the subjective numeric assessments of experts from different stakeholder groups on various components of risk. The authors include “risk factors” that affect both the probability of an event occurring (high value on the input implies that mishap is more likely to occur) and the consequence of the event occurring (high value of the input means there is a greater environmental consequence). This provides the common sense interpretation that risk increases as events become more common and larger in magnitude. The method is a reasonable general approach for grappling with the risk-related issues surrounding off-shore vessel traffic, as long as some general caveats are kept in mind. The most important caveat is that the output of the risk index has no “objective” interpretation. This is evidenced, in part, by the fact that the index has no units.<sup>3</sup> If all we were looking at was the risk index, we would not be able to evaluate whether a value of “50” is a serious threat to environment and public health or if “50” represents almost zero threat. This would be true even if there were no conceptual problems with the risk model. From a policy standpoint, this implies that the risk index (by itself) should not be used to justify whether there is sufficient risk to increase (or decrease) the amount of risk-limiting actions that should be taken at any point along the coast. As the authors note, the best use of the risk index is as a measure of “relative risk”. This means that it is relevant to informing policy decisions that are structured around answering the following question: given that we are going to spend \$X on risk reduction, where should we consider applying those funds? The following comments will focus on the applicability of the risk index model to address this question.

*Comments:* First, while an additive index has intuitive appeal, it is in conflict with the authors’ initial definition of “risk”: the probability of an event occurring *multiplied* by the consequence of that event. With the authors’ *additive* risk index, the relative importance of the “probability of

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<sup>2</sup> It is important to at least mention that the “worst case” may be that the tug can never make it over the bar due to weather conditions. This would truly be the “worst case” scenario as the tug would not be able respond at all. The importance of examining this scenario would depend on how often these conditions occur.

<sup>3</sup> One example of risk “units” would be the expected number of birds killed per year as a result of at-sea casualties. This would be calculated by a model that examines the probabilities and magnitudes of various bird mortality scenarios. It is important to note that the construction of such a model would be extremely challenging, and would still have significant uncertainties in how its results could be interpreted.

event” versus “consequence of event” is distorted. It includes eight elements that affect the probability of an adverse environmental consequence (i.e., vessel types, drift, collision, offshore distance, weather, tug availability, traffic, historical casualties) but only one item that describes the magnitude of that environmental consequence (i.e., environmental sensitivity).<sup>4</sup> This suggests that the magnitude of the negative consequence is only worth about 1/9 of the index, while it would conceptually be worth 1/2 the “risk value” (very loosely speaking) in a typical risk model. This problem may be compounded, as there appears to be little variation in the authors’ “environmental sensitivity” component. In sum, the index does not provide much insight into “risk”, but rather the “probability” of an adverse outcome (independent of its severity). Second, the strict additive index ignores the interrelationship between “risk factors”. In the risk index, the contribution of one risk factor is the same regardless of the values assigned to the other factors. For example, consider the following two elements of the risk index: “distance off-shore” and “tug availability”. According to the model, a point that is 5 nm off-shore and 2 days from a tug receives a risk contribution of 20 from these two risk factors. A point that is 5 nm off-shore and 15 hours from a tug receives a risk contribution of 14 from these two factors. However, even though these risk scores are quite a bit different (a 30% reduction in the index as you move farther from shore), there may be very little variation in the probability of a casualty (i.e., the tug may not be able to reach an offshore casualty in time to stop grounding because of the close proximity to the shore in both cases). This type of problem is inherent in the formula used for index construction.<sup>5</sup> Third, the relative importance placed on the various inputs is based upon the informed experience of participants in the project. While this type information is useful for assessing risk in offshore vessel traffic, it is associated with a certain degree of uncertainty. In my opinion these data are strongest for assessing the types of information that belong in a risk model. It is not as reliable for assessing the relative contribution of various factors to risk, although it is sometimes the best information available (and therefore should be used for this purpose with the appropriate caveats). This data source is problematic for examining potential interactions between risk factors, as there is a daunting number to consider. This may be one reason why these factors are left out of the risk index. In sum, little discussion is included on the limitations of these sorts of data, and no instruction in how the model should (and should not) be applied to help practitioners interpret its output.

*Suggestions:* Based upon my assessment of the construction of the risk index, I suggest the following strategies for making the model more useful:

1. Spend more time interpreting/ground-truthing index. Because of the uncertainty in the input data and the potential limitation of an additive index, the value of the analysis does not reside in the model output, per se (i.e., the maps do not “speak for themselves”). Rather, the value is in the discussion of the process that leads to the output. This includes interpretation of how the results for a specific scenario (e.g., fishing vessels of the coast of California) depended on various assumptions. At a minimum, the authors should include brief discussions describing the output of each risk scenario map (presented in Appendix L), including answers to the following questions:

Why do certain areas off the coast appear to be relatively low risk for specific vessels?

Why are other areas relatively higher risks?

Does the output have face validity (i.e., does it have intuitive appeal); and are there important interactions between risk factors that may be overlooked for the specific scenario?

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<sup>4</sup> Note the “Volume of Oil/Vessel Design Factor” may fit in both categories.

<sup>5</sup> It is important to note that alternative formulas for index construction may not reasonable given the type of data used as inputs in the model (i.e., largely qualitative assessments by informed individuals).

Not only would this provide a fuller description of the model, but it would help instruct the reader on how the model might be appropriately applied to examine risk. This would require much more description than currently presented, and may be more appropriate for a final report.

2. Simplify the risk index where possible. Since the output of the risk model requires considerable interpretation in order to be meaningful, the risk index should be simplified where possible. At a minimum, the environmental sensitivity risk factors should probably be removed, as it does not appear to be serving its intended purpose.<sup>6</sup> It is important to stress that the value of this report is in its exploration of risk situations rather than the output of the model in a specific case. It is my opinion that application of this model to specific cases should be done with great care, and that it should only be used in conjunction with other information that provides situation-specific validation of the model results. I would be happy to discuss any of these comments with you.

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<sup>6</sup>If the environmental sensitivity factor is retained, the authors may want to consider either (1) choosing an alternative weighting scheme, or (2) analyzing the index with and without that risk factor.