

Please carefully read the article below and answer the following questions:

In 1989, the Exxon Valdez ran aground in the Prince William Sound area off the coast of Alaska, causing a spill of millions of gallons of oil which killed fish, birds, and marine mammals, and other organisms, and fouled the shore. This widely publicized event sparked a debate on whether we should ship oil in this area and continue the threat to the environment or halt the shipment of Alaskan oil in order to protect the environment. As with most highly emotional political debates, this one focused on two polar extremes and did not debate the critical issue.

The critical issue in this case is not to decide thumbs up or thumbs down on Alaskan oil, but to determine the optimal level of safety in shipping Alaskan oil. There are many actions that can be undertaken to reduce the chances of a spill taking place, to reduce the magnitude of a spill if one does take place, and to reduce the damage associated with a spill of a given size. Actions that would lessen the chances of a spill taking place include placing computerized collision avoidance systems on oil tankers (and obstacles such as shoals and islands), requiring redundancy among key personnel (so that if the captain becomes incapacitated there is an equally skilled person in position to take over), and restricting other shipping when a tanker is in the shipping lanes. Actions that would lessen the amount of oil spilled if an accident did take place would include requiring double-hulled tankers and multiple oil compartments (like the cells of a car battery) in the tanker. Actions that spill that occurred would include requiring stand clean-up and containment equipment and crews that could be called into action the moment a spill occurs.

Questions:

- a. Please comment who shall born the liability of the oil spill event, who shall take the responsibility and action for the removal of the oil sludge from the coast and the sea? Why? (20%)
- b. What is your perspective on the risk management? Please describe the general activities of risk management as it is practiced today. (20%)
- c. What is 'risk'? Please define it in terms of mathematical expressions if possible, and give us your proposal how to mitigate the risk of the oil spill event. (15%)
- d. Please describe the process of your policy making for the optimal safety level of oil tanker to avoid oil spilling. How to determine the optimal accident rate? (20%)
- e. Please describe the role of a governmental official in charge of environmental protection and marine transportation respectively; the role of an environmental institution and other non-governmental institutions if this even occurs in Taiwan (Unfortunately, the similar event occurred already took place at the beginning of this year). Do you think there is sufficient space for us to improve to avoid the occurrence of similar event? How? (25%)