

ABSTRACT:

The vast resources of the world's oceans need to be fully utilized to benefit human activities in a sustainable manner. The maritime industry has made use of the ocean in a very responsible way, but inland water resources have been much more underutilized and under-maintained, especially for transportation. In an age so dire to find ways to mitigate the challenge of climate change and its associated impacts, recent research has indicated that inland water transportation represents the cleanest mode of transportation. This indicates the potential for an increase in usage of inland waterways for transportation. The use of inland water transportation is forecast to rise because of the potential for short sea shipping, expanding deep-sea operations, and alternative mitigation options for climate change. Coastal water transportation is associated with low probability, high consequence accidents, which makes reliability requirements for the design and operation for safety and environmental protection very necessary. Collision represents the largest percentage of accident risk scenarios among water transportation risk factors. This paper discusses recent work in risk and reliability-based design, and safe and efficient vessel operation in coastal waters. This includes systems based approach that covers proactive risk as well as holistic, multiple-criteria assessment of waterways variables required to develop mitigation options and decision support for preventive, protective and control measures for various collision accident scenarios within inland waterways.