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Act to Improve Navigational Safety and to Reduce the Hazards to Navigation Resulting from Vessel Collisions with Pipelines in the Marine Environment, and for Other Purposes Reviews User-contributed reviews.

It also identified that more substantial and widespread benefits for States, shipowners and seafarers could be expected to arise from the increased safety at sea, which was identified as the core objective of e-navigation. The input paper also noted that accidents related to navigation continue to occur despite the development and availability of a number of ship- and shore-based technologies that improve situational awareness and decision-making. The aim was to develop a strategic vision for the utilization of existing and new navigational tools, in particular electronic tools, in a holistic and systematic manner. Human Element, Training and Harmonization[edit] The last decades have seen huge developments in technology within navigation and communication systems. Sophisticated and advanced technology is developing rapidly. Mariners have never had more technological support systems than today and therefore there is a need to coordinate systems and more use of harmonised standards. Administrative burden, information overload and ergonomics are prominent concerns. A clear need has been identified for the application of good ergonomic principles in a well-structured human machine interface as part of the e-navigation strategy. Benefits for users and stakeholders[edit] On a global level e-navigation will: Standardize bridge design which globally enhances the opportunity to work cross-border, improves efficiency in training and reduces material cost. Similarities between nations and vessels would also increase efficiency and improve safety. Reduce barriers of trade through reduction of local solutions and bureaucracy. Reduce the risk of accidents and incidents. For Coastal states, Flag states and Port states e-navigation will: Improve efficiency in training, certification and supervision; Improve situational awareness by providing easy access to standard and reliable information; Improve efficiency in supervision, coordination, control, as well as coordination and information; Reduce the risk of accidents and incidents through efficient use of VTS services. For branches, organizations and industry e-navigation will: Provide flexibility with regards to training and rotation as standardization would lead to a more efficient market for standardized bridge products; Simplify reporting and thereby reducing the workload for operations; Improve safety for own fleet; Improve situational awareness for bridge personnel and thereby improving the speed and efficiency of decision making; Increase navigational safety in VTS regulated areas; Provide a direction for product development to a wide market; Provide opportunity for new products and solutions; For ship borne users e-navigation will: Further, a correspondence group overseen by the Norwegian Coastal Administration had an ongoing role in gathering input from national maritime administrations to proposals and decisions related to the process of establishing an e-navigation Strategy Implementation Plan SIP. The work on an e-navigation Strategy Implementation Plan was broken down into several clear phases: Assessing user needs Constructing an open, modular and scalable architecture Completing a series of studies: S1, S3 and S4 address the equipment and its use on the ship, while S2 and S9 address improved communications between ships and ship to shore and shore to ship. During the development of the SIP a number of tasks have been identified in order to continue the further development and implementation of e-navigation. Some of these tasks may require further consideration and investigation before taking a final decision on the best way forward and subsequent tasks. Further it was recognised that there is a need to identify shore-based functions and services. At present, there are many different types of services in most given situations or locations, such as ports, coastal and high seas. Core elements to the Plan[edit] The final e-Navigation Strategy Implementation Plan contains eight core elements, defined thus: Identification of tasks needed to be completed to satisfy the Solutions A phasing of the tasks and a high level roadmap A list of Maritime Service Portfolios that need to be developed A list of key enablers of e-navigation The continual assessment of user needs Proposals for a systematic assessment of how new technology can best meet defined and evolving user needs in the longer term Proposals on public relations and promotion of the e-navigation concept to key stakeholder groups Identification of potential sources of funding for development and implementation, particularly for developing regions and countries and of actions to secure that funding. Guidelines[edit] The combination of the five e-navigation solutions, and the three guidelines, Guidelines on Human Centred Design HCD for e-navigation, Guidelines on Usability Testing, Evaluation and Assessment U-TEA for e-navigation systems and Guidelines for Software Quality Assurance SQA in e-navigation, proposes an e-navigation implementation that facilitates a holistic approach to the interaction between shipboard and shore-based users. Along with work taking place under the aegis of the IMO, a number of public and private groups are working to advance e-navigation and topics related to e-navigation. Notes and references[edit].

Chapter 2 : A Public Health Perspective of Road Traffic Accidents

Read chapter 5 Avoiding Outside Interference with Pipelines: The safety of the U.S. undersea pipeline system is a major national interest and concern, whe Login Register Cart Help Improving the Safety of Marine Pipelines ().

It is unlikely that such systems will be economically justified for fishing vessels in the foreseeable future. Avoiding Pipelines when Mooring or Anchoring at Platforms The use of anchors by supply and service vessels in areas of dense pipelines or flowlines adjacent to offshore installations presents particular safety issues. In many cases, it may be difficult or impossible for a vessel operator to ensure that a dropped anchor will not strike a pipeline or flowline. In such conditions, permanent mooring equipment can often reduce the risk of damage substantially. Pipeline Location Data Adequate maps of pipeline locations would, in principle, make it possible to inform vessel operators of areas in which pipelines might be encountered. Collisions of vessels with pipelines are confined to shallow waters, mainly under state jurisdiction, where data on pipeline location, ownership and condition have not been systematically collected and put in accessible and comprehensive data bases. Some of the necessary information has been assembled by the Minerals Management Service, and some by operators under Office of Pipeline Safety regulation, but it is incomplete, particularly in the shallow waters where it would do the most good. It is in the process of digitizing the as-built maps, and plans to incorporate accident data, net hang sites, abandoned lines, and other information on that geographical database. To carry out its responsibilities under the Oil Pollution Act of see Chapter 6 , the agency will add data on pipelines in state waters to this data base personal communication, Alexander Alvarado, Minerals Management Service, February 3, The boundaries of MMS jurisdiction under the Oil Pollution Act, however, do not extend shoreward of the coastal barrier islands, so that bays and channels within that boundary will not be covered personal communication, E. Danenberger, Minerals Management Service, December 2, OPS requires pipeline operators to maintain their own detailed maps and records, of gas and hazardous liquid pipelines. These maps have not been incorporated in any central data base. State requirements regarding mapping and facility data vary widely, but are generally inadequate for this purpose. Louisiana and Texas, the two states with the overwhelming majority of pipeline mileage, rely on operators to keep as-built drawings. Pipeline location data could be gathered relatively cheaply during periodic surveys, using data from the Global Positioning System GPS. Improving the Safety of Marine Pipelines. The National Academies Press. Such surveys, if required by all state and federal regulatory agencies, would in a few years produce the necessary location data. Assembling the data in a central data base would be a straightforward task. The existence of a data base that accurately locates all pipelines would not in itself prevent collisions or pipeline damage. Effective use of this information could, however, reduce the likelihood of serious accidents. This notification system could be integrated eventually with the recommended pipeline leak notification system see Chapter 4 , which in turn would benefit from the pipeline data base. Standards for Vessel Inspection, Licensing, and Training: Coast Guard as its representative. The Coast Guard is responsible for negotiating and administering international conventions and enforcing the maritime laws of the United States with respect to the international conventions for inspecting seagoing vessels such as tankers, freighters, and passenger ships. The international conventions do generally apply to seagoing ships but uninspected vessels such as fishing boats and most of the smaller vessels that serve offshore oil and gas fields are subject to domestic standards. The convention articles, regulations, and resolutions, are designed to protect ships, their crews and passengers, the public, and the natural environment. They serve as guidelines for most national and state laws although the states may impose more rigid, and in some cases slightly different, requirements in specific areas. The need for uniform standards for vessels on the high seas that call at foreign ports is obvious. Conformance with these standards is strongly supported by the insurance industry, which uses economic forces to encourage the use of proper functioning equipment and the licensing of operators. Self-propelled drill ships, semisubmersible rigs, or other mobile offshore units, and most U. The various IMO agreements do not necessarily apply in their entirety to these vessels, although lights, sound signals, flares, flotation devices, and fire prevention and fighting equipment usually do conform. Generally, however, domestic U. Fishing boats and several classes of offshore service boats, and other vessels carrying fewer than six passengers for hire, are not required to be inspected. Crews of offshore service and fishing vessels are not considered passengers; nor are personnel being transferred from shore to offshore rigs considered passengers for hire under the Passenger Vessel Safety Act of The persons in charge of uninspected towing vessels and uninspected passenger vessels are required to be licensed as Operators. To be licensed as an Operator of an uninspected passenger vessel, an individual must pass a written examination and document experience and citizenship. These licenses frequently limit the operator to a specific vessel size and operational distance from shore. At the very least, obtaining the license requires the mariner to learn the Rules of the Road and be able to answer various open-book ques- Page 77 Share Cite Suggested Citation: Some companies, as well as the U. Power Squadron and the U. Coast Guard Auxiliary both volunteer organizations , provide courses and training to help license applicants. It should be noted, that each license requires specific sea service time served aboard a vessel and that licensing requirements for offshore service operators are considerably more stringent than uninspected passenger vessel licenses. Uninspected vessels in the offshore energy industry, such as offshore tugs, are generally operated, for insurance reasons, by persons with Master or Mate licenses, which are normally required only for operators of inspected vessels. At minimum, persons operating these uninspected vessels must possess a U. Fishing vessels are not required to be inspected, and their operators currently require no license. Congress and the U. Coast Guard, however, are considering means of ensuring that these vessels meet certain equipment and stability standards, and that their operators are competent. There are no data showing that a person who can pass a license examination for uninspected vessels is a better seaman than a thoroughly experienced mariner with years of experience. The skills needed to anchor a work boat near a platform in the Gulf of Mexico without snagging a pipeline on an exposed fitting or the skills needed to successfully drag a double-rigged shrimp trawl across 20 miles of seabed while avoiding many miles of pipeline do not relate to those needed to pass a College Board exam. However, to take full advantage of new technology for vessel positioning, additional, possibly costly training may be necessary; but this training should be encouraged. While loosely referred to as burial, this practice does not include covering the pipelines; the pipeline is lowered into the bottom by jetting, dredging, or plow methods, depending on local conditions. Generally currents are relied on to sweep sediments over the pipelines in due time. In cases in which natural sedimentation is inadequate, the pipeline may be covered by mechanical backfilling. Valves, lateral pipeline tie-in assemblies, and other pipeline appurtenances are protected from snagging trawls, nets, and anchors with pyramids of bags of concrete or other protective structures, or by lowering them as needed to prevent snags. The depth of burial required depends on local vessel traffic, soil and shoreline dynamics, and other engineering considerations. OPS requires that pipelines installed offshore in water less than 12 feet deep must be placed at least 3 feet below the bottom in soil 18 inches in consolidated rock ; in deepwater ports or navigable rivers and inlets, these depths are doubled 49 CFR The MMS requires that pipelines originating on the OCS be placed at least 3 feet beneath the bottom in waters less than feet deep. These regulations could conceivably leave a gap with no burial requirements between a foot water depth and the beginning of the OCS, but normal pipeline construction practice involves burial from the shore to depths of feet. Neither agency has a requirement for maintaining the required depth of burial. In addition, the agency was required to establish a program of mandatory inspections. OPS issued the required regulations in December , requiring operators to survey the pipelines and, by November , to rebury to a depth of three feet any found with one foot or less of cover 49 CFR By March , with more than 95 percent of the survey completed, only OPS will consider the results of this survey in determining the need for a mandatory continuing inspection program. The Pipeline Safety Act of P. The committee has no information leading it to believe that the currently required initial cover depths and procedures are either adequate or inadequate. Anecdotal evidence suggests that it may be not inadequate initial cover, but rather the loss of cover through erosion or fluidization of surrounding soils, that most often exposes pipelines to interference by vessels. Such was the case in the Northumberland and Sea Chief accidents. Regulators will need to assess the matter further, perhaps in conjunction with the periodic depth-of-cover surveys outlined later in this chapter. A sophisticated approach, taking into account local variations in shoreline and seabed dynamics, is likely to yield the safest and most cost-effective solutions. Pending the results of such a study, the currently specified initial depths must be considered adequate. Engineering Considerations in Installation Installation of a marine pipeline must take into account a variety of local conditions in addition to the minimum regulatory requirements, including soil characteristics, currents, vessel traffic, and the potential for erosion of the shoreline at shore crossings. These factors determine the initial burial depth, the amount of weight coating, and the need for any additional stabilizing features such as pipeline anchors or backfill. Figure is a schematic drawing of the decision process involved. The pipeline must be designed and constructed to maintain its initial depth of cover throughout its lifetime. It is recognized that a buried pipeline may tend to float up or sink down from its initial placement depending on its weight including contents and on the density and shear strength of the soil. In major storms, susceptible soils may fluidize enough to present such problems at depths of 60 feet or more. Erosion by ocean currents can cause other problems with pipeline cover and stability. Pipelines placed in trenches that run parallel to currents may be covered and stabilized by Page 79 Share Cite Suggested Citation: Mousselli, July 20, Prudent engineering practice involves thorough bottom surveys along pipeline routes, with soil core samples taken at regular intervals. The samples are analyzed for design parameters relevant to specific gravity, grain size, shear strength, resistance, and potential for fluidization. The information derived from such surveys helps in choosing pipeline routes, burial depths, and weight coatings. Pipelines are inspected at the determined depth of cover by divers using water pressure gauges accurate to within 3 inches of depth. A gauge reading on top of the pipe in the ditch is compared with a second made to the side of the pipeline on normal firm undisturbed bottom, and readings are recorded by a crew on the surface in the dive boat. The two gauge readings tend to average the effects of surface waves. Measurements are almost continuous as the diver swims along the pipeline in the newly created trench. If adequate cover is not found, the burying equipment is required to make additional passes. One uncertainty in determining the depth of cover in practice is the fact that divers must establish the actual firm and undisturbed bottom, which can be quite indistinct in the unconsolidated sediments found in much of the northern Gulf. In practice, however, experienced divers are quite accurate, placing their bottom pressure gauges within about 10 percent of measurements made according to shear strength personal communication, A. Mousselli, October 20, Pipelines installed across shorelines through trenches can accelerate erosion and create currents and wave conditions that remove cover from pipelines. The directional-bore installation method, by which pipelines are installed underground, without trenching was proven in the early s for river and canal crossings and pipeline installations that traverse environmentally sensitive areas, highways, and other areas where disturbance of the surface is undesirable. It is today required wherever possible by permitting agencies such as the U. Army Corps of Engineers and state coastal zone management commissions. It generally yields lower construction and maintenance costs, in addition to its safety and environmental advantages. Overall bore distances of as. The pipeline generally crosses the beach at about 50 foot below the surface, and gradually approaches the normal design burial depth at a point well beyond the shoreline.