New Fuels, New Risks: Contingency Planning in the Context of Alternative Fuel Spill Response

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The decarbonisation of shipping has become an increasingly prominent topic due to growing regulatory pressure, evolving public opinion, a rising demand for a faster energy transition by investors as well as an increased focus on sustainability within the industry. These factors have led to a marked increase in alternative fuelled vessels with 49.5% of ships on order due to run on alternative fuels in comparison to the 7.4% of the world fleet (by gross tonnage) currently running on these fuels. However, with a growing fleet of alternatively fuelled vessels comes the increasing risks of incidents involving these substances.

While the current research concentrates on the fate and behaviour of spills of alternative fuels, focus must be placed on alternative fuel / HNS contingency planning. The differences between the human health risks of oil and alternative fuels are stark, with ammonia seen as posing the greatest risk through its toxicity and with methanol, LNG, LPG, hydrogen and lithium-ion batteries representing risks from fires/explosions. The differences in response strategies to these incidents in comparison to traditional fuels are also evident. With the main technique of the oil spill response industry, containment and recovery, not being possible in many cases, the role of monitoring and evaluation will play a larger role in the response. Technological developments to support this paradigm shift are crucial, such as a need for more advanced modelling software and the development of unmanned autonomous vehicles to undertake monitoring in harsh conditions where risks to responders are high or unknown.

Due to these inherent differences, oil spill contingency plans do not translate smoothly into alternative fuel spill contingency plans and therefore, the need to develop an effective and realistic approach is clear. One of the factors that drives this is the considerable difference in timeframes of an incident. Rapid information exchange needs to occur between those on-board, authorities, salvors, nearby receptors and importantly the chemical industry. As many alternative fuels can lead to atmospheric releases, potentially harmful substances can travel at great speeds through the air in comparison to oil travelling at a slower rate through waves and currents. Therefore, notification systems supported by monitoring need to be in place to mitigate human health risks. These systems should then be tested during regular exercises to ensure response timeframes are appropriate.

The development of these contingency plans should be based on a robust risk assessment, created with the cooperation of multiple relevant stakeholders including the chemical industry. Coastal states with the ambition of becoming regional centres for alternative fuel bunkering need to ensure their authorities as well as their port operators have the means to react to these incidents. This is in terms of ensuring necessary equipment is available (e.g. for monitoring and evaluation) but also in terms of acquiring appropriate PPE and providing regular training exercises. In addition, these plans need to be scalable so that, if an incident escalates, a Tier 1 incident can be increased to a Tier 2/3 incident without arduous shifting of plans and personnel.

Although it is said that these substances have been shipped as cargo for many years, the projected significant uptake of these substances as bunkers will mean that the crew's experience would not be that of an experienced specialist crew working on gas carriers. It is likely that the expertise on-board vessels will be spread and diluted, inevitably leading to an incident that, if appropriate contingency planning and training are not in place, could lead to significant damage to human health and property.