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Formate Fluids and Environmental Regulations: A Global View of Benefits and Challenges

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Abstract

This study compares locational differences in regional and national environmental regulatory approaches to offshore environmental protection in relation to chemicals. Environmental regulations set acceptable discharge limits and define management boundaries for all related actions, from setting strategic HSE policy targets to choosing chemicals for specific operations. The local variations in regulations mean that chemicals acceptable in one location may not pass environmental consent conditions in another. Challenges such as variability represent to multinational offshore operators wishing to harmonise chemical risk assessment and identify chemical Best Available Technology (BAT) on a global basis are identified and discussed.

Formate fluids are used as an example throughout the discussion. These chemicals are illustrative of some inconsistencies between legal regimes. They demonstrate a low level of toxicity and have positive environmental performance profiles, as illustrated through the use of several case studies. Yet formates cannot be used or discharged in all offshore areas in the same way.

Certain regulatory variations can be traced to how ecotoxicological data is utilised within the environmental consent process. Reliance on single test data for setting absolute thresholds may lead to very different consent conditions than combining results from several tests - which together mimic a simple food chain - and applying this as input to risk modelling. For the case study chemicals, the detailed risk assessment approach indicates a positive environmental profile, favourable for discharge consents. In contrast, the single test threshold approach leads to total containment requirements. In the face of such challenges, unified corporate risk assessment criteria can support informed decision making and give operators the benefit of consistent identification of chemicals representing BAT.

Introduction

The aim of any well construction project is to optimise profitability by delivering a high value well at lowest cost and risk. A contributing factor to the overall value created by such a project is the prudent management of health, safety and environmental (HSE) risks^{1,2,3}. HSE risks related to chemical use and discharge are recognised and prioritised through:

1. In-house, corporate HSE risk management targets, policies and procedures
2. Risk evaluation and reduction to meet external regulatory consent conditions.

The internal environmental risk evaluation requirements may be directly related to external environmental consent requirements. As a consequence, corporate environmental risk management targets – and rigour – may vary between locations. This is in some contrast to, for example, health and safety risk management. H&S regulations in different countries or legislating territories vary considerably in stringency, but the details are seldom contradictory⁴. Global corporations tend to apply global health and safety targets and policies. Environmental regulations on the other hand vary not only in stringency but also in details. Therefore, although environmental regulations around the world tend to encompass the same key principles (pollution minimisation, environmental protection and the use of BAT), the regulatory details may include very different approaches^{5,6,7} to determining acceptable discharges.

This variation in details can sometimes lead to contradictory risk assessment results. This is partially explained by the need to take into account the diversity and different sensitivities of the receiving environment – the risk receptor. Such diversity creates a different basis for risk definition than occupational health and worker safety aspects, where the risk receptor – people – is globally the same¹. Corporate H&S risk reduction targets and policy objectives can therefore be reasonably easily established on a global scale, even down to details. H&S aims may indeed be weighted to comply with the most stringent regulatory regime likely to be encountered. In contrast, a globally unified environmental risk management system is more challenging to design and implement – to the extent that it is not always recommended to go down this route⁸. In this paper, the

ⁱ It is acknowledged that, for example, vast differences in regulatory health standards or safety cultures exist between areas. The discussion here is based on the common nominator being humans as receptors to risk and humans being equally vulnerable to chemical exposure, wherever on the globe.