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EOSCA Position Statement Regarding Discharge Factors in HOCNF submissions

Proposed updates to the SKIM supplementary guidelines for completing the HOCNF for Norway will require that a discharge factor be given in the HOCNF for all chemical components in a product. Currently, the OSPAR HOCNF requires discharge factors to be provided only for surfactants.

This statement outlines EOSCA's position on the proposal by the Norwegian SKIM group that a discharge factor for all component substances should be included in HOCNF submissions in Norway.

While the concentrations of added production and injection chemicals in the process fluid streams are relatively easy to calculate, the concentrations of chemicals subsequently discharged in the PW stream are not. Accurate discharge figures exist only for a few chemicals, where mass balance (field) studies or direct analyses have been performed. The partition coefficient (K_{ow}) of a substance between oil and water (determined experimentally or by estimation methods) can in principle be used to estimate the partitioning of a substance between oil and water phases, assuming that a state of equilibrium has been reached. The CHARM (Chemical Hazard and Risk Management) model includes application-specific algorithms that allow such calculations to be made.

The HOCNF does not require that ecotoxicological data be provided for organic substances that are on the PLONOR list or Annex IV of REACH. For commodity chemicals, where the chemistry is well-defined, it should not be necessary for every supplier to calculate a discharge factor, especially if the method for doing so is not standardised. It is EOSCA's view that for PLONOR/Annex IV and commodity substances (i.e. non-speciality chemicals) there should be a list of approved discharge factors. Failure to do this will result in a range of discharge factors being submitted for the same substance.

Inorganic substances are not mentioned in the SKIM revision, so is it to be assumed that a discharge factor of 100% will be automatically assigned to these substances? Also, there seems to be little point in providing a discharge factor for substances in products that are used in closed systems, or in other application scenarios where discharge to sea, either directly or via the PW stream, is not relevant. The revised SKIM guidelines do not mention alternative application scenarios.

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Surface-active substances (surfactants) may not partition between oil and water phases in the same way that non-surfactants do, tending to accumulate at interfaces or form micelles at high concentrations. It is therefore difficult to estimate or measure a partition coefficient for this type of substance. Accordingly, the CHARM Implementation Network (CIN), which oversees the development and acceptance of the CHARM model, agreed on the use of a table of default discharge factors appropriate to general surfactant types (CHARM User Guide Version 1.4; Table 4). These discharge factors were arrived at by considering the general physical and chemical properties of a range of surfactant chemistry typically used in oilfield applications, as well as any mass-balance data available at that time. These default factors have therefore been in use for many years.

Considering the high degree of uncertainty in any attempt to estimate a partition coefficient for substances that are normally not expected to show typical partitioning behaviour, and the fact that industrial grade surfactants are not pure substances, the default discharge factors adopted by the CIN group are considered to be as useful as any that may be arrived at using empirical or theoretical evaluations. Bearing in mind the broad grouping of surfactants in CHARM into chemistry that typically is either oil soluble or water soluble, the default factors are considered to be extremely conservative, erring well on the side of the “precautionary principle” as adopted in the OSPAR approach to chemicals regulation. For surfactants that can not be assigned to any of the specified types, 100% discharge is assumed. To try to “fine-tune” these default factors by applying methodology that in many cases is still regarded by Regulators as being unreliable or not validated, does not seem to be a rational approach to improvement.

It is the view of EOSCA that the use of existing default discharge factors for surfactants, as presented in the CHARM User Guide should continue to be acceptable, until reliable data is available to fully validate the adoption of revised discharge factors. Any proposals to change the current default values, or to apply alternative methods to estimate discharge factors for surfactants, should be presented to the CIN group, where they may be properly discussed and evaluated. If deemed appropriate, any proposed revisions should then be presented for review and acceptance by the OSPAR Offshore Industry Committee (OIC), where responsibility for approval and inclusion in the HOCNF ultimately lies.

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