

PAME I-2020: Agenda item 6.2(g)

Project Title: New low Sulphur fuels, fate and behavior in cold water conditions

Submitted by Norway

Background from PAME 2019-2021 Work Plan:

The objective is to gather knowledge and explain the large variation in environmental toxicity of light and intermediate fuel oil. This is a joint project proposal by PAME and EPPR.

PAME anticipates finalizing and approving this project proposal intersessionally in coordination and consultation with EPPR.

Action Requested by PAME I-2020:

PAME is invited to review the project and provide input and guidance on its content with the aim to approve the project proposal.

Project Overview - scoping of work:

The project was tentatively included in PAME's 2019-2021 Work Plan as "*Environmental toxicity and fate of light and intermediate fuel when spilled in cold waters.*"

The proposed project aim is to gather knowledge and describe facts accurately. Industry involvement will be necessary.

The project is advised to be performed in two sub tasks, task one by EPPR and task two by PAME. The two sub tasks will be written in one report, so close corporation between PAME and EPPR will therefore be required.

The project will focus on Ultra-Low and Low Sulphur hybrid- and intermediate fuel oils. Comparisons and fact descriptions related to Low Sulphur Heavy Fuel Oils entering the market in January 2020 (IMO Global Sulphur Cap) will however be made.

1. ***The fate of Low Sulphur fuel oil when spilled at a cold sea surface***

The main goal of sub task one is to describe why fuel oil from the same viscosity and ISO class behave differently when spilt on a cold sea surface. In studies performed by the Norwegian Coastal Administration it is documented that the fate of such oils can be quite different, even though their starting point in relation to viscosity and the segment the fuel fills in the fuel market is very similar.

The second question under Sub task one will be to answer what measures can be taken to optimize intermediate and hybrid fuel oil for cold water and ice (composition and chemistry of fuel oil).

Today some Hybrid oils become very stiff and greasy and they may be difficult to remove mechanically with skimmers or other oil uptake methodologies. Other hybrid oils on the other hand, will be in a liquid form even at a cold sea surface and hence much easier to remove. Oils with acceptable oil uptake properties will also normally naturally disperse faster and thereby be less persistent in the environment.

2. Environmental toxicity of low Sulphur fuel oils

Sub task two will try to answer the following two questions:

1. Why do we find high toxicity levels in certain fuel oil samples within the same classification (e.g ISO classes), while fuel samples from other batches with the same product, or the equivalent product from other similar producers, may have considerably lower toxicity levels?

Is it the crude oil used in the refinery as an input that is decisive for the toxicity level? Or the refinery technology or processes? Or is the toxic substances added for other reasons by the refinery, or by the oil blenders?

A toxic oil can give severe and harmful effects in the fragile Arctic environment.

2. What measures can be taken to avoid high toxicity levels in fuel oils in Arctic waters and in other sea areas? Industry involvement will be required for this task.

Closely related Sub task performed by EPPR and PAME and close corporation:

Sub task one and two are closely related. A spill involving a highly toxic and persistent fuel, which can be difficult to disperse or recover mechanically, may lead to severe and long lasting effects in the arctic environment.

Lead Organization:

Norway will lead the project, but would welcome other co-leads for the project.

Point of Contact:

The Norwegian Coastal Administration:

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Background Information:

Basis for this proposal to PAME is a project funded by the Norwegian Coastal Administration (NCA, 2016-2017) that included a characterization study on 3 hybrid/LSFO-fuels and 5 different marine diesel oils (DMA) showed:

1. The three hybrid oils had a wide span in properties, and two of them had highly solidifying properties in cold water (high pour point values) that reduced the effectiveness of dispersants. With regard to one of the oils reduced oil skimmer performance was observed due to solidification.
2. A wide span in toxicity / chemical composition were also revealed. The main findings from this NCA project were presented at AMOP 2017 and at Interspill in London 2018. The project report can be downloaded here:

<http://www.kystverket.no/Beredskap/forskning-og-utvikling/diesel--og-hybridoljer/forskningsresultater/>

This pre-project led to a concern by the Norwegian Authorities and by other international Oil Spill Agencies and organizations concerning response to future spills of marine fuels oil (particularly in cold and Arctic areas). There is a need for further characterization of the properties on the increasing numbers of new marine fuels coming on the market, and that need to be taken into account when evaluating oil spill contingency strategies for releases related to shipping activities. A good overview of the physicochemical / weathering properties, fate and behavior when spilled

at sea, potential toxicity and feasibility of the different response techniques like mechanical recovery, dispersants and in-situ burning (ISB) for these oils will be of high importance for the coming years.

Detailed Description:

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|-----------------------------|---|
| Fall/winter 2018 | The project idea presented to EPPR II-2018 and PAME II 2018 |
| December 2019 | A project proposal presented for EPPR II, 2019 |
| December 2019 | Application for funding submitted |
| January/February 2020 | The project proposal approved intersessional by EPPR HoDs |
| February/March 2020 | A project proposal presented and approved by PAME I, 2020 |
| March – July 2020 | Project preparation |
| August 2020 | The project launched |
| August 2020 – December 2021 | Details will be prepared after approval and clarification about funding |

Funding:

Norway will apply for funding for the project, but request other partners for possible funding.

Link to PAME's work:

- Project was included in PAME's 2019-2021 Work Plan.
- Link to AMSA recommendation II(F): Oil Spill Prevention: *"That the Arctic states decide to enhance the mutual cooperation in the field of oil spill prevention and, in collaboration with industry, support research and technology transfer to prevent release of oil into Arctic waters, since prevention of oil spills is the highest priority in the Arctic for environmental protection."*
- Links to many Strategic Actions from the Arctic Marine Strategic Plan, 7.3.
- Relevant to the PAME 2019 report on Alternative Fuels in the Arctic

Partners: The project is planned as a joint EPPR – PAME project.

Arctic states, PPs, NGOs and observers would all be important partners.

Expected Duration: August 2019 - December 2021

Final Product(s): Report

Action Requested by PAME I-2020:

PAME is invited to review the project and provide input and guidance on its content with the aim to approve the project proposal.