



## **Cross-cutting WP2 / WP3 Workshop organised by Cedre**

March 1st - 4th 2021

(Deliverable D3.1)

This report summarizes the workshop organised by Cedre, March 1st – 4th 2021, as part of the IMAROS project.

Originally planned at Cedre (France), the workshop was finally held remotely due to the Covid-19 situation.

The main objectives of this cross-cutting workshop were :

- The transfer of knowledge from WP 2 to WP 3
- The presentation of preliminary results
- The basis establishment for an informed decision on the way forward for
  - Selection of products for WP 3
  - Selection of products for WP 4
  - Discussion and planning of WP 3
  - Initial input to WP 4

Half-day sessions (morning) were organised. The agenda, approved by CPT before the workshop, is enclosed in this report (Appendix 1). The list of participants (CPT and national partners) is also enclosed in this report (Appendix 2).

### Monday 1st of March :

After a short introduction of the participants and of the hosting organisation (Cedre), the Project manager (Silje Berger, NCA) presented the status of the project. PM highlighted the 6 months prolongation communicated with the EU due to the Covid-19 situation and reminded of the coming Deliverables and Milestones.

The Danish partner (Torben Iversen, Royal Danish Navy Command) presented a status on the WP2 (Compilation of knowledge) and reminded of the outcomes from the Copenhagen Workshop (February 4th-5th 2020, see Deliverable D2.1).

The following topics were then discussed :

- LSFO market and HSFO / LSFO 2020 sales from Belgium and Rotterdam ports. Those figures seem to differ (higher part of HSFO sold in Rotterdam).
- Unclear identification of some samples may be due to some producers' fear of being identified or exposed negatively.
- A meeting with VNPI (bunker delivery that provided 4 x 2L samples with no producer identification) is planned on 12/03/2021. Identification of the provided samples would be helpful for the project.
- Biofuels : Did we get such samples ? Our understanding was that 2 samples from VNPI would be biofuels but given the information provided by the bunker delivery, it is not possible to affirm this (note : Marijke Neyts from RBINS will try to investigate for FAMES identification).
- Nature (blend product or not) of the oils : The exact definition of « blended » was also discussed. Blends (opposite to distillates) represent a mixture of different oils with different viscosities. However, viscosity seems not anymore to be the only « blend » target, sulfur content can also be.
- Possibility to test for adhesion at the laboratory scale. Cedre can test oil adhesion on oleophilic plates.

### Tuesday 02/03/2021 :

Preliminary results from the Task 3.1 (Physico-chemical characterisation) were presented by Cedre (Fanny Chever), and Task 3.4 (identification / forensics) by RBINS (Marijke Neyts) followed by a discussion on those results. The different topics discussed were the following :

- A high diversity of of physical-chemical properties was observed on the 13 samples , resulting in different behaviours and potentially on different response strategies.
- Considering oil fingerprinting, from the total ion chromatogram it is not possible to know if the oil is a low sulphur oil or not. However, the study of specific Sulphur compounds (C1-, C2-, C3-dibenzothiophens and BNT) can show that there is less sulphur present in ULSFO.

- Diversity of asphaltenes/waxes : does it reflect differences of crude oils or refinery processes ?
- The high energy test (MNS) for dispersibility is important to study during the weathering experiments (it may differ from the low energy test IFP).
- Method for aromatics determination (especially naphtalenes) was discussed. This soluble compounds group is important for an ecotoxicity point of view.
- Potential oil adhesion (or non adhesion) was discussed as well as the notion of « stickyness ». No laboratory protocols / standards exist to test this oil property.
- Discussion on sample selection was initiated : In a view of response strategy, variability of samples should be adressed. Plan B should be already discussed to save time if Plan A is not available.
- ULSFO / VLSFO : To follow the original scope of the project, a ULSFO should be selected. However, the 2 ULSFO provided in the Task 3.1 have already been quite extensively studied (if it is confirmed that IM9 is actually a Shell product). The VLSFO that is closest to the 2 ULSFO (IM2) could then also be interesting.
- Large variation between different batches is expected due to the processes, especially within the VLSFOs, how to handle this in the selection process ?

From this discussion it was decided to share the results presented during the day to the CPT (that could forward to their national partners) for further discussion on the selection on Wednesday. A decision support matrix will help as a basis for discussion (Action : Cedre).

### Wednesday, 03/03/2021

SINTEF (Per Daling) presented the Preliminary Results from the Laboratory study on Wakashio VLSFO fuel oil at 2°C and 15°C. Conclusions of these first meso-scale experiments were :

« Wakashio fuel oil seems not to be a particularly difficult oil with respect to weathering and behaviour at sea compared to previous tested LSFO fuels (e.g. not a particularly waxy / high pour point ; Did not show solidified lumps in the flume at 2 and 15°C). For oil spill response, mechanical recovery should be feasible, but is expected to have reduced efficiency for dispersant use within one day of emulsification at sea. »

Nexts WP3 tasks were presented. Cedre (Fanny Chever) presented tasks 3.2 (Oil weathering) and 3.3 (Ecotoxicity) and RBINS (Sébastien Legrand) presented task 3.5 (Modelling weathering).

Concerning weathering, 3 oils should be tested, at 5°C and 15°C, in seawater conditions. Concerning ecotoxicity, 3 marine organisms (algae, copepods and amphipods) should be exposed to 3 oils (direct exposure for amphipods, soluble oil fraction for the algae and copepods).

The main discussion on the next WP3 tasks was on the ability to study the oils in freshwater conditions. Sweden is particularly exposed to accidental release in lakes (where energy can be quite similar as the marine ones). To answer this request, after weathering on the 3 oils in seawater conditions, the most interesting sample could be studied at the pilot scale in fresh water conditions (at 1 temperature). The freshwater conditions would be compared to seawater ones for this oil and behaviour of other oils could be extrapolated. Regarding ecotoxicity tests, the most interesting oil could also be tested on a freshwater algae species.

Tasks in WP4 were then introduced by NCA (Bjorn Frost) and Cedre (Mikaël Laurent). Both NCA and Cedre plan to test oils for recovery, using different skimmers. The 2 partners presented their facilities and available tools to carry out Task 4.1 (Mechanical recovery). Cedre (Fanny Chever) presented tasks 4.3 (In Situ Burning) and 4.4 (Shoreline clean-up). Task 4.2 (Dispersants) is included in Task 3.2 (Weathering), dispersibility tests being performed at different time scales on subsamples from the flume tank.

Regarding Recovery tests, discussions are needed to define the tests performed at NCA and at Cedre and what equipment will be tested. Three oils will be tested at NCA, 2 at Cedre. Some partners already received propositions from suppliers who seem very keen to participate to the project. Contacts and offers for equipment testing received by the different partners will be gathered and selection / answers will be collegially discussed.

Regarding the other response options, the possibility to test washing agents was discussed. This method is not tested at Cedre as it is not considered as an efficient technique by this partner.

Finally, the project coordinator discussed the possibility to use the money saved from travelling / workshop organisation / meetings with industry for either 1) additional experiments or 2) more invitations to the final meeting. Question will be addressed to the EU.

If more experiments are possible, different options could be considered :

- The 3rd oil tested for recovery at NCA could be tested for weathering at one temperature at Cedre.
- Tests in freshwater conditions could be more extensively studied.

A CPT meeting was organised on Thursday 04/03/2021 in order to summarize / evaluate the workshop and finalise the sample selection. Sample logistics (for WP3 and WP4) was also discussed in order to save time, efforts and money and ensure the best scientific way to proceed. At the end of meeting, it was decided to study the same samples for WP3 and WP4 (as much as we can) and the selection is :

Sample 1	IM-5	Wakashio VLSFO	For WP 3
Sample 2	IM-9 or IM-2 <b>and</b> IM-1	Rotterdam VNPI ULSFO Stena Oil RMG380 VLSFO	Follow up necessary before final decision
		Stena Oil RMD80 ULSFO	Only for 1 weathering experiment (3.2)
Sample 3	IM-6	Valetta bunkers VLSFO	
Sample 4	IM-4	Minerva bunkering VLSFO	For WP 4

Contacts should be initiated as soon as possible by the partners to check for product availability and start administrative / logistics work.

## APPENDIX

Appendix 1 : Agenda

Appendix 2 : List of participants

Appendix 1 : Agenda

	Day 1	Day 2	Day 3	Day 4 - CPT
	Monday 01/03	Tuesday 02/03	Wednesday 03/03	Thursday 04/03
0900-0915	Log in / IT issues	Log in	Log in	Log in
0915-0930		<b>Status on WP3 Task 3.1</b> (Fanny's talk + Questions)	SINTEF presentation (Wakashio)	CPT Summary of the workshop
0930-0945	Welcome / Agenda		<b>Preliminary results -Task 3.4</b> (Marijke's talk + Questions)	<b>Next tasks WP3</b> - Tasks 3.2 and 3.3: Fanny -Task 3.5: Sebastien Legrand
0945-1000				
1000-1015	Participants presentation	Break	Break	Break
1015-1030				
1030-1045	Status on the project	Discussion on Tasks 3.1 & 3.4 & Selection of samples	<b>Introduction to the tasks in WP 4</b> by NCA and CEDRE	CPT Meeting (Project calendar + Administrative remarks)
1045-1100				
1100-1115	Break	Discussion on WP2	Discussion on WP4	Break
1115-1130	<b>Summarized status from WP2</b> (Torben's talk + Questions)			
1130-1145		Discussion on WP2	Break	Selection of samples
1145-1200				
1200-1215	Discussion on WP2	Break	Selection of samples	
1215-1230				
1230-1245	Discussion on WP2	Break	Selection of samples	
1245-1300				
1300-1315	Discussion on WP2	Break	Selection of samples	

Appendix 2 : List of participants

Last Name	First Name	Organisation	March 1st	March 2nd	March 3rd	March 4th
Chever	Fanny	Cedre	X	X	X	X
Guyomarch	Julien	Cedre	X	X	X	
Laurent	Mikaël	Cedre			X	
Berger	Silje	NCA	X	X	X	X
Holbu	Jan Willie	NCA	X	X	X	X
Frost	Bjørn	NCA	X	X	X	
Dolva	Hilde	NCA	X	X	X	
Frogner	Ingvild Alstad	NCA	X	X	X	
Royset	Jon Arve	NCA	X	X	X	
Sørheim	Kristin	SINTEF		X	X	
Daling	Per	SINTEF		X	X	
Pettersen	Thor Arne	SINTEF			X	
Johnsen	Marius	SINTEF			X	
Iversen	Torben	Danish Navy Command	X	X	X	X
Lundgreen	Kim	Danish Environmental Protection Agency	X	X		
Riegels Andersen	Dennis	Danish Navy Command		X	X	
Uvegard	Jimmy	Swedish Coast Guard	X	X	X	X
Savic	Jelena	Swedish Coast Guard	X	X	X	X
Pålsson	Jonas	Swedish Agency for Marine and Water Managment			X	
Legrand	Sebastien	RBINS	X	X	X	X
Neyts	Marijke	RBINS	X	X	X	
Scheldeman	Kobe	RBINS	X	X	X	
Lepers	Ludovic	RBINS	X	X	X	
Zammit	Mevric	Transport Malta	X	X	X	X
Gabriele	Richard	Transport Malta	X	X	X	
Darmanin	Kristina	Transport Malta	X	X		

