



Outcome of the Ninth Meeting of the Expert Group on Monitoring of Radioactive Substances in the Baltic Sea (HELCOM MORS EG)

Introduction

0.1 In accordance with the decisions by HELCOM MORS EG 8-2018 (Paragraph 8.3 of the Outcome) and HELCOM HOD 54-2018 (Paragraph 6.5 of the Outcome), the Ninth Meeting of the HELCOM Expert Group on Monitoring of Radioactive Substances in the Baltic Sea (MORS EG 9-2019) was held on 21-23 May 2019 at the premises of the Center for Nuclear Technologies, Technical University of Denmark (DTU Nutech) in Roskilde, Denmark.

0.2 The Meeting was attended by delegations from Denmark, Finland, Germany, Lithuania, Poland, Russia and Sweden as well as a representative of the International Atomic Energy Agency Environment Laboratories (IAEA-EL). The Meeting took note of absence of Latvia and the regrets by Radiation Safety Department of Environmental Board of Estonia for not being represented at the Meeting. Mr. Kins Leonard, Vice-Chair of OSPAR's Radioactive Substance Committee, participated as an observer. The list of participants is attached as **Annex 1**.

0.3 Mr. Jacques van Wonterghem, Head of Division, DTU Nutech, opened the Meeting and welcomed the participants to Risø Campus.

0.4 The Meeting was chaired by Ms. Tamara Zalewska, Chair of the HELCOM MORS Expert Group. Mr. Joni Kaitaranta, HELCOM Data Coordinator, acted as secretary of the Meeting.

Agenda Item 1 Adoption of the Agenda

Documents: 1-1, 1-2

1.1 The Meeting adopted the Agenda of the Meeting as contained in document 1-1.

Agenda Item 2 Information by the Secretariat, the Contracting Parties and IAEA

Documents: 2-1, 2-2, 2-3

2.1 The Meeting took note of the information on the outcomes of recent HELCOM meetings of relevance to MORS EG (document 2-2), especially following meetings.

- 54th Meeting of the HELCOM Heads of Delegation (HOD 54-2018), Helsinki, Finland, 14-15 June 2018;
- Ninth Meeting of the HELCOM Working Group on the State of the Environment and Nature Conservation (STATE-CONSERVATION 9-2018), Copenhagen, Denmark, 22-26 October 2018;
- 19th Meeting of the Group for the Implementation of the Ecosystem Approach (GEAR 19-2018), Copenhagen, Denmark, 7-8 November 2018;
- 55th Meeting of the HELCOM Heads of Delegation (HOD 55-2018), Helsinki, Finland, 4-5 December 2018;

- 40th Meeting of the Helsinki Commission (HELCOM 40-2019), Helsinki, Finland, 6-7 March 2019;
- Tenth Meeting of the HELCOM Working Group on the State of the Environment and Nature Conservation (STATE-CONSERVATION 10-2019), Hamina, Finland, 6-10 May 2019;
- 20th Meeting of the Group for the Implementation of the Ecosystem Approach (GEAR 20-2019), Berlin, Germany, 15-17 May 2019.

2.2 The meeting took note on the issue of reporting under Recommendation 26/3 and noted that there is no need for a lead country approach since it is the task of the MORS EG as described in Terms of Reference.

2.3 The meeting agreed that the proper way to notify on the reporting under Recommendation 26/3 would be to prepare a document related to the update frequency of the recommendation (which is annual) and the description of data reporting arrangements. The meeting agreed that the Secretariat and Chair will prepare a document and the draft will be circulated to the MORS EG by June 14 and with the aim to submit the document to State & Conservation 11-2019.

2.4 The Meeting took note of the the strategic plan and work plan for the update of the Baltic Sea Action Plan (BSAP) (document 2-1).

2.5 The Meeting took note of the information on the review and revision of HELCOM existing ecological objectives (document 2-3) and considered the request by State & Conservation 10-2019 whether the objective on radioactive substances should be kept as currently formulated or be rephrased in a more general way. The meeting agreed to discuss it under Agenda Item 6.

Agenda Item 3 Scientific reports by the Contracting Parties and IAEA

Documents: 3-1, 3-2, 3-3, 3-4, 3-5, 3-6, 3-7, 3-8, 3-9, 3-10

3.1 The Meeting took note of the information on Danish data from 2018 as presented by Mr. Sven Nielsen ([document 3-9](#)).

3.2 The Meeting took note of the results on monitoring of radionuclides in the Baltic Sea 2018 from Estonia ([document 3-6](#)).

3.3 The Meeting took note of the results on monitoring of radionuclides in the Baltic Sea 2018 from Finland as presented by Mr. Vesa-Pekka Vartti ([Presentation 3-A](#)).

3.4 The Meeting took note of the results of German MORS monitoring in 2017 and 2018 by BSH as presented by Ms. Stefanie Schmied ([document 3-1](#)).

3.5 The Meeting took note of the results of radiological monitoring in the Lithuanian part of the Baltic Sea during 2018 as presented by Ms. Rasa Morkuniene ([document 3-2](#)).

3.6 The Meeting took note of the monitoring results on the concentrations of Cs-137 and Sr-90 in seawater, fish and plants in the Polish sector of the Baltic Sea in 2018 as presented by Ms. Tamara Zalewska ([document 3-3](#)).

3.7 The Meeting took note of the monitoring results of radioactive contaminations of bottom sediments and fish in the southern Baltic Sea in 2018 as presented by Ms. Tamara Zalewska ([document 3-5](#)).

3.8 The Meeting took note of the information provided by Russia on the status of funding for monitoring programme and that currently there is no funding for carrying out monitoring in the Baltic.

3.9 The Meeting took note of the results of Sweden on biota, seawater and sediment data that has been reported to the database for HELCOM MORS 2018 as presented by Ms. Maria Lüning ([document 3-7](#)).

3.10 The Meeting took note of a short overview of the Swedish facilities in decommissioning where radioactive materials are handled or have been handled as presented by Ms. Maria Lüning ([document 3-8](#)).

- 3.11 The Meeting took note of information by Sweden about the Tvären project as presented by Mr. Mats Eriksson.
- 3.12 The Meeting took note of the information by OSPAR Assessment work, as presented by Mr. Kins Leonard ([Presentation 3-B](#)).
- 3.13 The Meeting took note of a study by Saniewski et al. 2018, presenting levels of Cs-137 and K-40 concentrations in gray seals *Halichoerus grypus* in the southern Baltic Sea as presented by Ms. Tamara Zalewska ([document 3-4](#)).
- 3.14 The Meeting took note of the presentation on determination of Cs-135 in environmental samples using chemical separation and ICP-MS/MS and the results obtained using different detection techniques as presented by Mr. Liuchao Zhu, DTU Nutech, Technical University of Denmark.
- 3.15 The Meeting took note of the presentation on anthropogenic U-236 used as an oceanic tracer as presented by Mr. Mu Lin, DTU Nutech, Technical University of Denmark.

Agenda Item 4 Data collection, databases and ongoing monitoring programme

Documents: 4-1, 4-2, 4-3, 4-4, 4-5, 4-6

- 4.1 The Meeting considered the MORS environmental data compilation 2019 as presented by the Secretariat ([document 4-3](#), [presentation 4-A](#)), and checked that all the reported and available national data is reported to the MORS database.
- 4.2 The Meeting took note and considered the annual report of the MORS environmental data 1984-2017, compiled by the HELCOM Secretariat as presented by the Secretariat ([document 4-4](#), [Presentation 4-B](#)).
- 4.3 The Meeting commented on the report as follows:
- Regarding use of subbasins, in all work HELCOM Subbasins (2018) should be used throughout all database related documents and to keep MORS subbasins in the database as a column but not to use for quality assurance purposes
 - For biota data, samples are usually pooled, e.g. there is large number of individuals used for analysis, but the meeting noted that there are differences
 - Swedish sediment samples for 2016 were submitted and should be included. The Secretariat will check the submitted data.
 - For certain measured low values of Cs-137 in biota and seawater, the result should be checked with the data provider. The Secretariat will contact the data providers as needed.
- 4.4 The Meeting considered the inventory of discharge data from 1998-2017 reported until 14 May 2019 as presented by Mr. Vesa-Pekka Vartti, STUK ([document 4-5](#)) and checked and validated the data.
- 4.5 The Meeting took note of the information on air releases and liquid discharges from Leningrad NPP in 2018 provided by Mr. Andrey Stepanov ([document 4-7](#)).
- 4.6 The Meeting took note of the information on the progress of IAEA's MARIS database content and infrastructure as presented by Ms. Iolanda Osvath, IAEA EL ([presentation 4-C](#)).
- 4.7 The Meeting took note of the information on the mistakes of the German data reporting of 2016 and the updated sediment device list of Germany as presented by Ms. Stefanie Schmied ([document 4-1](#)).
- 4.8 The Meeting considered the summary of reported sediment types as presented by Secretariat ([document 4-6](#)).

4.9 The Meeting requested national data providers to check their national procedures on storing and reporting sediment types.

4.10 The Meeting discussed the comprehensive list of sediment types in MORS database and that the practice of analysing sediment types does not require the use of combination sediments.

4.11 The Meeting agreed that the historical data reported using the comprehensive list should be kept as it has been reported and collected, but the guideline could be modified to include recommendation to use main commonly used sediment types, which the meeting agreed would be following:

0 = Gravel; 1 = Sand; 3 = Silt; 4 = Clay; 5 = Mud.

The guideline should also mention that combination samples can be reported. The meeting also amended the table in the guideline to include whether the use of each sediment type is recommended or not.

4.12 The Meeting reviewed the latest version (13 May 2019) of the Guidelines for Monitoring of Radioactive Substances, updated according to MORS EG 8-2018, as presented by the Secretariat ([document 4-2](#)).

4.13 The Meeting agreed for following modifications to the guidelines:

- Update the sediment list as described in Para 4.11
- Fish monitoring site BARC10 should be removed due to the reason of established MPA in the area
- Parameter TISSUE in table BIO01 should be obligatory as it is currently reported and is used for the indicator data extraction
- Map on seawater locations should be corrected for few Swedish stations
- For the Discharge data, the suggested excel format for reporting was adopted.

4.14 The Meeting requested national data providers to verify the current information in the guideline and provide corrections/updates of the following information by 14 June 2019:

- to check that the stations and coordinates are correct
- to verify DEVICE_NAME table ([Attachment 2 of doc. 4-2](#))
- to verify ANALYSIS_METHOD table ([Attachment 3 of doc. 4-2](#))
- to amend the list of references in the attachment of the guideline

4.15 The Meeting agreed that the reporting format excel files should be attachments of the guideline.

4.16 The Meeting agreed that the updated guideline and the updated reporting format excel file for Environmental and Discharge data will be circulated to the MORS EG and made available in the HELCOM website.

Agenda Item 5 Analytical quality assurance, reliability of data and intercalibrations

Documents: 5-1, 5-2

5.1 The Meeting took note of the information about the sampling and the shipping addresses for the next large volume sampling for MORS seawater intercomparison to be carried out by Germany during 2020 ([document 5-1](#)).

5.2 The participants were requested to verify the shipping addresses and provide any corrections to Germany (Stefanie.schmied@bsh.de).

5.3 The participants of the MORS seawater intercomparison confirmed their wish of receiving a sample.

- 5.4 The Meeting took note of the results of the seawater intercomparison study presented by Ms. Meerit Kämäräinen ([presentation 5-A](#)).
- 5.5 The Meeting welcomed the information that the results of intercomparison in general show that the results between laboratories are well in line.
- 5.6 The Meeting took note of the update on IAEA proficiency test exercises for radionuclides in seawater, with particular focus on results obtained in 2018 by laboratories of HELCOM's Expert Group on Monitoring of Radioactive Substances in the Baltic Sea, as presented by Ms. Iolanda Osvath, IAEA EL ([document 5-2](#)).
- 5.7 The Meeting welcomed the information that the reported results of HELCOM Contracting Parties are accepted.

Agenda Item 6 Indicator reports, fact sheets and assessments

- 6.1 The Meeting took note of the latest version of the core indicator "[Radioactive substances: Caesium-137 in fish and surface seawater](#)", which is available online at the HELCOM indicator website as presented by Ms. Tamara Zalewska.
- 6.2 The Meeting took note that the link to thematic assessment under monitoring methodology should be updated.
- 6.3 The Meeting discussed the concept of indicator threshold values and that in case of the radioactivity indicator it should be decided whether the used approach should be based on radiation safety approach or whether the approach should be more strict approach on limiting to anthropogenic radioactivity.
- 6.4 The Meeting discussed the way to present key message of the core indicator to policy makers and agreed that the focus could be to communicate clearly also the downwards trend despite that currently threshold values are not reached.
- 6.5 The Meeting discussed the threshold values and took note that the current ones obtained for pre-Chernobyl level is obtained from MORS Database reported data for 1984-1985 time period, which is rather limited.
- 6.6 The Meeting took note that the first HELCOM indicator workshop was held 14-15 May 2019 in Berlin and the second workshop is planned for autumn 2019.
- 6.7 The Meeting took note of the results of the State and Conservation WG's review of HELCOM Baltic Sea Environment Fact Sheets (BSEFS), and the recommendations on the fact sheets of relevance for MORS EG as outlined in State & Conservation 9-2018 Document 6-1Rev1.
- 6.8 The Meeting took note of the information submitted by STUK on the updating of the following Baltic Sea Environment Fact Sheets:
- [Total amounts of the artificial radionuclide caesium -137 in Baltic Sea sediments](#) (last updated in 2014)
 - [Liquid discharges of Cs-137, Sr-90 and Co-60 into the Baltic Sea from local nuclear installations](#) (last updated in 2013)
- 6.9 The Meeting discussed the need for the updating interval for the sediment BSEFS based on guidance from State & Conservation and agreed on following:
- [BSEFS Total amounts of the artificial radionuclide caesium -137 in Baltic Sea sediments](#) will not be updated any more and the information could be updated for and included in the next Thematic assessment on Radioactivity.
 - [BSEFS Liquid discharges of Cs-137, Sr-90 and Co-60 into the Baltic Sea from local nuclear installations](#) will continued to be updated as recommended by State & Conservation. The Meeting agreed that proper updated interval would be every third year.

- 6.10 The Meeting welcomed the information from Finland that the discharge fact sheet can be updated by June 2019 with data until 2017.
- 6.11 The Meeting discussed the preparation of the next thematic assessment on radioactivity in the Baltic Sea and agreed that the thematic assessment on radioactivity should feed to the third State of the Baltic Sea report and the schedule should be synchronized with that process.
- 6.12 The Meeting took note of the following information by the national data providers of the Contracting Parties on options for methodology and provision of data on Polonium-210 in fish and noted that current monitoring and samples analysed does not include Polonium-210 analyses.
- 6.13 The Meeting took note of the following information of relevance in relation to national implementation of the EU WFD and EU MSFD and integration of radioactivity issues in this work:
- For Germany, the outcome of HELCOM thematic assessment on radioactivity is used in the national MSFD process
- In Poland, only national data is used for basins and compared against reference values and integrated with CHASE tool to be used as part of the hazardous substances.
- 6.14 The Meeting discussed the definition of ecological objectives in BSAP related to radioactive substances and how it should be reflected in the assessments and whether it should be described based on pre-Chernobyl level or not.
- 6.15 The Meeting took note of the approach applied in OSPAR which can be considered as an assessment procedure ([Presentation 6-A](#)).
- 6.16 The meeting took note that for radiocaesium or other human-induced radionuclides there is no natural background value, thus the pre-Chernobyl value is rather easily understandable and cannot be compared to natural values, which would be zero.
- 6.17 The meeting was of the opinion that ecological objective referring to pre-Chernobyl objective is backward-looking objective and should be updated.
- 6.18 The meeting took note of the presentation by Denmark on how the dose-based assessment could be converted to concentrations in the environment, based on food safety regulations as presented by Mr. Sven Nielsen ([Presentation 6-B](#)).
- 6.19 The meeting discussed on the use of dose-based ecological objectives and threshold concentrations in seafood and how those could be applied in indicator-based assessment.
- 6.20 The Meeting suggested to rephrase the current objective and suggested following formulation: **“Radioactivity at negligible risk level to humans and environment”**
- 6.21 The Meeting agreed that rephrasing the ecological objective would also have consequences on the current indicator threshold values, which are based on pre-Chernobyl levels.
- 6.22 The Meeting agreed to set up a task force to prepare new dose-based threshold values for the radioactivity core indicator. The meeting welcomed the offers from Sven Nielsen, Stefanie Schmied, Marc-Oliver Aust, Tamara Zalewska and Vesa-Pekka Vartti to take part in the work of the task force.

Agenda Item 7

Future work

Documents:

- 7.1 The Meeting discussed and planned future work based on the updated [Terms of Reference](#) of HELCOM MORS EG adopted by State & Conservation 9-2018 and noted that the currently planned activities cover the aims and expected outcomes outlined in Terms of Reference.

7.2 The Meeting noted that the paragraph in Terms of Reference on trends of export on radionuclides from the Baltic Sea to the North Sea and vice versa could be discussed in the next thematic assessment and should be based on radionuclides for which monitoring data is available.

7.3 The Meeting also noted that there is currently no data collection on non-nuclear activities (e.g. hospitals).

7.4 The Meeting welcomed the information by Lithuania that they will host the meeting of MORS EG in 2020. The Meeting agreed that MORS EG 10-2020 will be held on 26-28 May 2020 in Vilnius.

7.5 The Meeting welcomed the information by IAEA that they will look into the possibilities of hosting the meeting of MORS EG in 2021 in Monaco.

7.6 The Meeting took note that the next meeting of State & Conservation (11-2019) will be held on 21-25 October 2019 in Latvia and the work of the group should be presented in the meeting as required in the Terms of Reference.

Agenda Item 8 **Other business**

Documents: 8-1, 8-2

8.1 The Meeting took note of the survey on HELCOM knowledge and research needs submitted by the Secretariat (document 8-2) and that the Contracting Parties and experts are invited to submit proposals by the end of June 2019 (ullali.zweifel@helcom.fi), noting that the proposals will be discussed at State & Conservation 11-2019.

8.2 The Meeting recalled the survey carried out in 2016 and then the knowledge and research needs related to work of MORS EG were following:

- results of measuring radioactivity in different tissue matrices of fish;
- concentrations of ¹⁴C in the marine environment;
- background levels of natural radionuclides.
- plutonium remobilisation in anoxic conditions
- remobilisation of radionuclides from dump sites

8.3 The Meeting agreed that as a response to the knowledge and survey needs, update of the indicator threshold value is required to meet the updated BSAP ecological objective.

8.4 The Meeting updated the information in the list of HELCOM MORS EG contact addresses (document 8-1). Taking into account the EU General Data Protection Regulation (GDPR, (EU) 2016/679), the Meeting agreed that the contact address list will be made available on the HELCOM Meeting Portal upon receipt of consent for publication by all contact persons.

8.5 The Meeting thanked DTU for the excellent meeting arrangements.

Agenda Item 9 **Outcome of the Meeting**

Documents: Outcome

9.1 The Meeting adopted the draft Outcome of HELCOM MORS EG 9-2019 containing the main decisions of the Meeting. The Outcome of the Meeting will be made publicly available in the HELCOM Meeting Portal, together with the documents considered and presentations given during the Meeting.

Annex 1. List of participants

Name	Organization	E-mail address
Chair / Poland		
Tamara Zalewska	Institute of Meteorology and Water Management - National Research Institute	tamara.zalewska@imgw.pl
Denmark		
Jixin Qiao	Technical University of Denmark	jiji@dtu.dk
Sven Nielsen	Technical University of Denmark	spni@dtu.dk
Per Roos	Technical University of Denmark	roos@dtu.dk
Helle Popp	Technical University of Denmark	hepop@dtu.dk
Liuchao Zhu	Technical University of Denmark	lizhu@dtu.dk
Mu Lin	Technical University of Denmark	mulin@dtu.dk
Jacobus Swartz	Technical University of Denmark	jasw@dtu.dk
Jesper Skov Andersen	Technical University of Denmark	jeskan@dtu.dk
Finland		
Meerit Kämäräinen	STUK - Radiation and Nuclear Safety Authority	meerit.kamarainen@stuk.fi
Germany		
Stefanie Schmied	Federal Maritime and Hydrographic Agency	stefanie.schmied@bsh.de
Marc-Oliver Aust	Thuenen Institute of Fisheries Ecology	marc-oliver.aust@thuenen.de
Lithuania		
Rasa Morkuniene	Environmental Protection Agency	rasa.morkuniene@aaa.am.lt
Russia		
Andrey Stepanov	Khlopin Radium Institute	stepanov@khlopin.ru
Sweden		
Maria Luning	Swedish Radiation Safety Authority	maria.luning@ssm.se
Mats Eriksson	Swedish Radiation Safety Authority	mats.eriksson@ssm.se
IAEA		
Iolanda Osvath	International Atomic Energy Agency (IAEA), Environment Laboratories	i.osvath@iaea.org
Observers / invited guests		
OSPAR		
Kins Leonard Vice-Chair OSPAR RSC	Centre for Environment, Fisheries and Aquaculture Science (Cefas)	kins.leonard@cefas.co.uk
Data consultant – Discharge database		
Vesa-Pekka Vartti	STUK - Radiation and Nuclear Safety Authority	vesa-pekka.vartti@stuk.fi
HELCOM Secretariat		
Joni Kaitaranta	HELCOM Secretariat	joni.kaitaranta@helcom.fi