

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

International Co-operative Programme on Effects on Materials, including Historic and Cultural Monuments

Draft Agenda for 35th Meeting of the Programme Task Force

The meeting was held between 24th-26th April 2019. The meeting took place at the University of Paris-Diderot, Paris.

1. Opening of the meeting (*Johan Tidblad*)
 - Johan opened the meeting and welcomed the delegates.
2. Information from the local organisers (*Aurélie Verney-Carron*)
 - Aurelie presented practical information about the meeting location.
3. The participants presented themselves. Delegates present:

Cleo Kosanović (Croatia) (only 24th April),
Ivona Igréc (Croatia) (only 24th April),
Kateřina Kreislová (Czech Republic),
Zdenek Bartak (Czech Republic)
Tiina Vourio (Finland),
Aurélie Verney-Carron (France),
Yesmine Ben Amor (France),
Ruth Keller (Germany),
Stefan Brüggerhoff (Germany) (only 25th April),
Pasquale Spezzano (Italy),
Teresa La Torretta (Italy),
Terje Grøntoft (Norway),
Daniel de la Fuente Garcia (Spain),
Isaura Rábago (Working Group on Effects),
Johan Tidblad (Sweden),
Andrew Gordon (Sweden),
Markus Faller (Switzerland)
Vasile Rus (EGGA, UK)
Tim Yates (BRE, UK)
Patrice and Isabelle Coll (France, only for dinner 24/4)

4. Overview of meeting objectives and approval of the agenda (*Johan Tidblad*)
Johan Tidblad presented the draft agenda, which was approved.
5. Discussion of 2018 Work plan
The following reports were finalised in 2017 and the meeting is expected to approve the reports, with comments if necessary
 - a. ICP Materials Report 83: Call for Data “Inventory and condition of stock of materials at UNESCO world cultural heritage sites”. Part II – Risk assessment (*Pasquale Spezzano*)
 - *Pasquale Spezzano gave an overview of the report. The report details the names, locations and materials of the objects. Environmental data is also presented. Several sites participated in the call for the data: Croatia, Germany, Spain, Italy, Norway, Sweden, Switzerland. 1st year corrosion/recession/soiling rates for each site/material are presented as well as the effect of the various parameters according to the dose response function (DRF) used.*
 - *Terje commented that the values of NO₂ and O₃ seem to have been switched for copper at Nidarosdomen. **Pasquale will recheck the data tables and calculations.***
 - *Aurelie commented that the threshold for soiling of glass is more like 3% haze before cleaning is initiated, instead of the 1% haze perception threshold.*
 - *Tim commented that the cleaning rates of glass are dependent on the type of object, historic monuments may require more conservative cleaning rates due to the risk of damage due to cleaning operations.*
 - ***The assumptions used in the calculations regarding the types of materials and exposure conditions should be clearly described in the report (Pasquale will review the text in the report).***
 - *No other comments were given, and the report was provisionally approved by the group.*
 - b. ICP Materials Report 84: Technical manual for the trend exposure programme 2017-2018 including Annex A1 Description of test sites (*Johan Tidblad*)
 - *No samples or environmental data has been received from Estonia. Johan has tried to contact the site (Margus Kört) but no success yet. The start date was received so the samples should be exposed.*
 - *Some sites are missing information in the manual:*
 - *9 Langenfeld-Reusrath (Germany) - **Johan to contact Stefan B.***
 - *43 Tel Aviv (Israel) - **Katerina to contact Jaques Neguer***
 - *46 London (UK) - **Tim to contact John Watt***
 - *47 Los Angeles (USA) - **No contact***
 - *49 Antwerp (Belgium) - **Terje to contact Rene Van Grieken***

- *It was agreed that all data in the manual should be updated by participants if changes are made to test sites (send information to Johan).*

6. Information from WGE and common work plan items 2019

a. Overview of recent developments in WGE/EMEP (*Isaura Rábago*)

- *Isaura gave an update on the latest developments of the WGE, summarized as below:*
- *The CLRTAP long term strategy has been agreed for 2020-2030 and beyond.*
- *There is a move from long-range to urban scales of measurement. The resolution of human impacts is not currently enough, but for natural environments it is adequate. Effects of human health is a priority, so therefore a focus is required on an urban scale.*
- *Improvement in the communication between scientists and policy makers is required in order to make the right decisions.*
- *Environmental monitoring networks should be maintained and/or improved.*
- *There is a new coordinating centre (ICP modelling and mapping) CCE-UBA Germany.*
- *ICP materials should check if any reports should be translated to Russian/French.*
- ***ICP Materials do deliver “Official Document” for 5th Joint EMEP/WGE meeting. This report could perhaps be a summary of the UNESCO site report (deadline: 20th June 2019).***
- *The 40th anniversary of the CLRTAP is on 11-12th December 2019.*

b. The new WGE portal <http://unece-wge.org/> (*Johan Tidblad*)

- *Johan presented the webpage and encouraged all to give feedback and suggestions for improvements.*
- *Terje commented that a separate file with environmental data is available but it is not complete. Acknowledgements for sources should be included. **ALL to review the file and add any missing data and sources (deadline: Q3 2019).***

c. Thematic session on black carbon and its effects (*Johan Tidblad*)

- *Johan will present ICP Materials data on BC on materials to EMEP in September 2019. The content of the presentation is to be decided. It was suggested that a summary of report 71 could be given. A request for more recent data was given to the group*

- **Terje will send out a request for BC data to all test sites. ALL shall report to Johan/Terje what data is available (deadline Q2 2019).**
 - **Aurelie will consider the correlation between BC and haze. Aurelie will send any available data to Johan (deadline Q2 2019).**
 - *There was discussion about the various methods of measuring BC. Johan will contact EMEP to establish their method of measurement, and this could be used as the basis for ICP Materials BC measurements. See also presentation below on measurements BC*
7. Discussion of 2019 work plan
- a. UNESCO Call for data Part III (Report 86), plan for continued work (*Pasquale Spezzano*)
- *Pasquale presented the report. Costs per m² maintenance of a material presented for 4 Italian sites. It was noted that in order to increase the amount of data presented in the report information from other countries is required. Pictorial examples of before/after cleaning/restoration could be also included in the report.*
 - **Pasquale will add data about actual maintenance intervals for Italian sites and send out a request for the other countries to contribute where possible. (Deadline: July 2019).**
 - *It was discussed if relationship for limestone degradation is linear with time.*
 - *It was discussed if the background degradation rate used in the report is too low. It was suggested that a comparison could be made to the 8-year DRFs. (Tim will provide input to Pasquale, deadline: Q2 2019)*
 - *It was discussed if the costs presented in the report are too high for the future due to the expected reduced pollution. Pasquale will investigate this.*
 - *It was commented that the report should highlight the cost of inaction.*
 - *It was commented that the report should highlight that the costs presented incorporate sources of damage other than air pollution.*
- b. Discussion on corrosion and soiling data for the on-going exposure for trend analysis, including plan for report 85 on corrosion and soiling data (*Johan Tidblad*)
- *It was commented that the length of exposure is incorrect for some exposures. ALL to send correct data to Johan*

(adjusted for length of exposure). Johan will send a template to ALL to use (Deadline: June 2019).

- *It was agreed which parameters shall be reported for each material report:*
 - *CS mass loss*
 - *SS pitting and mass loss*
 - *WS mass loss*
 - *Zn mass loss*
 - *Cu mass loss*
 - *Limestone surface recession*
 - *Soiling:*
 - *Glass haze*
 - *Limestone/marble reflectance*
 - *Coil coated colour, gloss, reflectance*

- i. Carbon steel and Stainless steel (*Katerina Kreislova*)
 - *It was noted that both mass loss and pit depth data is required for assessment of stainless steel.*
- ii. Weathering steel (*Daniel de la Fuente*)
 - ***Daniel will notify all when it is time to withdraw the weathering steel samples.***
- iii. Zinc (*Markus Faller*)
 - *No comments*
- iv. Copper (*Johan Tidblad*)
 - *No comments*
- v. Limestone (*Tim Yates*)
 - *No comments*
- vi. Modern glass, limestone and marble (*Aurélie Verney-Carron*)
 - *The haze threshold (1% or 3%) was discussion. Further work is required to decide which value to use.*
 - *It was discussed that a longer exposure period (4 years) of stone materials is possibly needed? **Aurelie will investigate what is required to carry out this and report to Johan.***
- vii. Coil coated materials (*Tiina Vuorio*)
 - *1st year analyses of the dirt on the sample surfaces were presented. It was shown that the relationship between visual inspection and spectrophotometric analysis results do not correlate well. More measurements are therefore required to find the best method of evaluation – reflectance (threshold 35%), digital image analyses, mass change before/after cleaning, analysis/description of dirt, etc.*
 - *The correlation between the latest rain event and soiling could be analysed, but detailed environmental data (amount of rain*

- per day during the last exposure month) is required. **Terje will contact sites for available data and send to Tiina. (Deadline: Q3 2019).**
- Available daily precipitation data: France, Switzerland, Spain, Finland, Czech, Italy, Sweden (Stockholm, but not Aspretten), Norway (Oslo, but not Svarnvik).
 - Uncertain: Germany
- c. Discussion on current status regarding the collection of environmental data for the on-going exposure for trend analysis, including plan for report on environmental data (*Terje Grøntoft*)
- Some data is missing/not reported. **Terje will contact relevant sites to try and obtain all available data.**
 - Acknowledgments for sources of data: some sites are missing acknowledgments, **Terje will contact relevant sites for missing data.**
 - **Deadline for complete database Q1 2020. Deadline for data delivery to Terje Q3 2019.**
8. Medium term work plan (2020-2021)
The meeting should agree on a proposal for work plan 2020-2021 among the following ideas and/or other ideas discussed at the meeting.
- a. 36th meeting of the Programme Task Force
- Proposed: Bochum, Germany 6-8th May 2020
- b. Exposure for trend analysis
- i. Report 87 Environmental data 2017-2018 (2020)
 - ii. Report 88 Trends 1987-2018 (2020)
 - Change title to “1987-2019” in order to incorporate WS results.
 - iii. Report 91 Technical manual 2017-2021 (2021)
- c. UNESCO Call for data
- Report 89 UNESCO part IV (2020).
 - Report 90 (2021)
 - It was proposed that Part IV report could consist of:
 - An analysis of the relative importance of individual pollutants on the cost of damage for Italian sites.
 - An application of models with increased resolution at specific UNESCO sites (2021) 1km x 1km.
 - New call for data: **Pasquale will produce a summary of work to date in a brochure or similar Deadline 2020).**

- d. Strengthening EMEP-WGE cooperation
- i. Measurements of black carbon in the network of test sites – access to electricity?
 - *It was agreed that the method of measurement needs to be consistent for all sites to make data comparable.*
 - *A survey of available measuring equipment at all sites is required.*
 - *Teresa La Torretta made a presentation of some available measurement techniques*
 - ***Johan will discuss with EMEP if a common workplan is relevant.***
 - ii. Assessment of the importance of pH in precipitation. Acidification and S/N compounds – still important and to what extent?
 - *It was agreed that at most sites pH is the least important parameter, but it is more important at northern sites. DRFs use pH so it is required as a parameter. A recommendation can be made how to use the DRFs without pH data.*
 - ***Terje will prepare a note on this matter (2020).***
 - iii. Models with increased resolution at specific UNESCO sites
 - *Comments given above in 8c.*
- e. Update of mapping manual to include soiling
- *It was agreed that soiling needs to be added to the mapping manual (2021).*
 - *The threshold value for haze was discussed again as per 7b vii: an analysis is required in order to make a recommendation for the threshold.*
- f. Measurements for evaluation of chloride deposition (wet candle)
- *The sampling frequency of chlorides using wet candle was discussed: Sampling frequency of 3 months is preferred (but testing is required to validate if 3-month exposures are accurate compared with 1-month exposures). Proposed test sites were discussed. It was agreed that all test sites will be responsible for preparing, exposing and analysing wet candles.*
 - *Chloride sampling using the dry plate method was discussed: Zdenek presented results from Czech R. comparing wet candle to dry plate methods. It was agreed that if the dry plate method is to be used within ICP Materials, testing is required to determine if the method and the cloth material is valid for 3-month exposures. The winter months e.g. Dec-Feb are the most relevant in sites with de-icing salts. Test sites would need to expose both wet candle and dry plate equipment in order to*

- evaluate the methods. Dry plate samples (and shelters) could be prepared and analysed by Czech R.*
- *Plan for 2019-2020: Test if the wet candle method works for 3-month exposures (compare 3-month Cl⁻ concentrations with 3x 1-month Cl⁻ concentrations). Investigate possible collaboration with members of ISO committee (9225).
Katerina will discuss at ISO meeting (June 2019) and Johan will communicate what ICP Materials should do after this.*
- g. Update of dose-response function for zinc
- *It was agreed that the results from exposures after year 2000 (when the CR's start to level out) shall be tested. **Markus will propose some actions (work with DRFs and new exposures) at the next meeting (2020).***
- h. Exposure of polymer materials
- *It was discussed that a large amount of polymers are used in architecture therefore it could be interesting to investigate these within ICP Materials. **Ruth will provide suggestions of materials to expose and parameters to measure at the next meeting (2020).***
9. Dissemination of results
- a. Scientific publications and presentations
- *Grøntoft, T., Verney-Carron, A. and Tidblad, J. (2019) Cleaning Costs for European Sheltered White Painted Steel and Modern Glass Surfaces Due to Air Pollution Since the Year 2000, Atmosphere, 10(4), 167. URL: <https://doi.org/10.3390/atmos10040167>*
 - *Kreislová K., Knotková D., The Results of 45 Years of Atmospheric Corrosion Study in the Czech Republic, Materials 2017, 10 (4), 394; doi:10.3390/ma10040394, pp. 1 – 10, URL: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5506999/>*
 - *K. Kreislova, D. Knotkova, P. Fialova, The effect of pollution onto structural material's degradation, proceeding of abstracts of 3rd World Summit on Climate Change and Global Warning, February 27-28, 2019, Prague, Czech Republic, ISBN 2325-9655, pp. 38, URL: <https://www.scitechnol.com/proceedings/the-effect-of-pollution-onto-structural-materials-degradation-9887.html>*
 - *Faller, M & Hans, U. Atmosphärische Korrosion im Bauwesen. Das ICP Materials Programm. Galvanotechnik 4/2019, URL: <https://www.leuze->*

verlag.de/images/stories/Redaktion_GT/Inhaltsverzeichnisse_GT/inhalt_gt_0419.pdf

- b. Other ways of involving scientists outside ICP Materials
- Terje has applied for project for study of costs of corrosion of materials due to air pollution.
 - Tiina – H2020 application ongoing “CE-SC5-07-2020: Raw materials innovation for the circular economy”
 - Aurelie – application ongoing “ERC project on ‘black crusts’ as a proxy of ancient air pollution”.
- c. Development of web page (Johan Tidblad)
- Formal ownership of the ICP Materials webpage is now under the parent company to KIMAB (RISE AB). Currently the webpage is continuously updated and documentation from the meeting including all presentations will also be available after the meeting.
 - It was suggested that a section could be added to highlight the main findings in an easily readable way. **Johan will investigate the best way to incorporate this.**

10. Financing of the programme

- Sweden: funding from environmental agency. From 2020 the funding will be subject to a bidding process.
 - Italy: activities carried out for ministry for environment, but no direct financing.
 - Norway: annual funding applied from environmental agency.
 - Czech R: annual funding applied from ministry of environment.
 - Finland: No direct funding for ICP Materials, costs covered by other projects. SSAB finances some coating tests.
 - Germany: 3-year funding to be applied for from ministry of environment.
 - Spain: annual funding applied from ministry of environment.
 - Switzerland: 4-year funding (to 2022) from ministry of environment.
 - France: no direct funding, so costs are covered by other projects.
- ii. Isaura recommended to mention that all countries could include all “in-kind” work in applications for funding.

11. Any other business

- None.