

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

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

Minutes of Meeting for
32nd Meeting of the Programme Task Force

The meeting was held on May 11-13th 2016, starting on Wednesday May 11th at 09:00 and ending on Friday May 13th. The meeting took place at ENEA – Frascati Research Center, Via Enrico Fermi 45, 00044 Frascati (Rome).

The meeting was attended by representatives from the following Parties to the Convention on Long-Range Transboundary Air Pollution: Croatia, Czech Republic, Finland, France, Germany, Greece, Italy, Norway, Spain, Sweden, Switzerland, and the UK. The meeting was also represented by a member of the Executive Body of the Convention.

1. Opening of the meeting
Johan Tidblad opened the meeting.
2. Information from the local organisers
Pasquale Spezzano welcomed the participants of the meeting and gave practical information about the meeting and the venue. Cristina Leonardi, from the Ministry of the Environment, welcomed the participants of the meeting and gave an overview of executive body activities. Currently the Assessment report is being prepared that will be put forward in a side event to the Eighth Environment for Europe Ministerial Conference in Batumi (Georgia), June 8-10. Cristina also informed about economic concerns and highlighted ways to improve effectiveness of funding, as well as the prioritisation of activities.
3. Approval of Draft Agenda
The draft agenda was approved without any changes.
4. Introduction
The delegates introduced themselves:
Johan Tidblad, Andrew Gordon, Terje Grøntoft, Katerina Kreislova, Stefan Brüggerhoff, John Christodoulakis, Tiina Vuorio, Aurélie Verney-Carron, Markus Faller, Ulrik Hans, Pasquale Spezzano, Cristina Leonardi, Tim Yates, Mirna Bojić and Daniel de la Fuente.
5. Discussion of 2015 Work plan:
The following report was finalised in 2015 and the meeting is expected to approve the report, with comments if necessary.
 - (a) ICP Materials Report No 77: Pilot study on the inventory and condition of stock of materials at risk at UNESCO cultural heritage sites. Part IV: The relationship between the environment and the artefact (*Pasquale Spezzano*)

The following comments were given on the main conclusions:

Current restoration frequencies are much lower than each 4-7 years (more like x10). On-going work with gravestones in the UK with cleaning every 0,5-1 years causes more damage than atmospheric effects. Such maintenance could give at least the same degradation rates as atmospheric effects. 5-10 years between cleaning is normally planned in for new buildings but this does not usually occur due to economic reasons. Higher air temperatures produce more biogrowth on porous materials (limestone) and more water absorption. This can lead to increased cleaning rates, thus an indirect effect on degradation.

Recent temperature rise in Prague has been observed, which could affect the results of the study. Roads near Klementinum have been re-routed which is planned to remove the source of air pollution at this location.

For modern glass a 1% haze factor (approx.) is used to initiate cleaning, but there are currently no clear guidelines. Approximately 1 year between cleaning at rural sites is observed, but is more frequent at urban sites.

It was suggested that localised pollution effects could be investigated using European environmental agency test site data, which is openly available online.

The report was approved.

The following report was originally scheduled to be finalised in 2015 and its finalisation and ambition level is to be discussed

(b) ICP Materials Report No 79: Technical manual and description of test sites (*Johan Tidblad (JT)*); Possible additional contributions by site representatives and sub-centres to be decided.

Germany Sites 9 and 11 – information exists, Stefan Brüggerhoff (SB) will send to JT. Site 12 – managed by someone else, information has already been sent to JT. JT check data to see if sufficient, otherwise will contact SB.

UK sites – Tim Yates (TY) has paper copies of site information, but needs time to scan documents.

USA site 58 – SB to contact Stefan Simon about this site. Aurelie Verney-Carron has had contact with another person from Yale and will send this information to JT.

Regarding the legacy of different nomenclature in old reports – a reference system shall be given to the different reporting periods and their respective nomenclature in order to make it clearer in future reports.

Contact details should be included in the technical manual, but only selected persons. Otherwise the ICP Materials website should be the main source of contact information. The website needs to be kept up to date however. Everyone is responsible for notifying the Chair if/when they change their contact details. It was suggested that a mailing list would be useful.

Regarding acknowledgments for data sources: these should be on the ICP Materials webpage (as a long version), and in reports (as a short version). Terje Grøntoft (TG) shall compile list of data sources and send to JT for assessment of how complicated it is to issue acknowledgements correctly.

Regarding report numbering: a new number shall be issued for each report. An update shall be issued every 3 years, and shall be presented on the ICP Materials website as the latest version.

6. Information from WGE and common work plan items 2016, specifically:
- (a) Enhance the involvement of countries in the Eastern Europe, the Caucasus and Central Asia (EECCA) including possible translation of the mapping manual to Russian (*All*); During 2015 Russia underwent a “change of direction at the institute” which makes continuation of ICP Materials work uncertain. There has been no contact with TG when requesting environmental data. For the trend exposures the Cu, Zn, glass samples have been received but not steel or weathering steel. JT shall request for the remaining samples to be returned, and for ICP Materials to pay for delivery costs.

JT notified the group that Montenegro are interested in joining the programme, in particular related to the UNESCO call for data, but currently have no funding available.

Mirna Bojić from Croatia will assist the chairs to send the UNESCO call for data to different heritage centres (world heritage committee). Turkey and Azerbaijan are possibilities for collaboration.

- (b) Co-operate with programmes and activities outside the ECE region and provide information on them (*All*)
CEN TC346 Conservation of cultural heritage: TY is convenor for WG2 for inorganic porous materials. Current work is to define common language for conservators to use. Work is mostly been focused on stone materials, and cleaning considerations are covered (regarding decision making processes but not prescriptive regimes or methods). ICP Materials data is more useful to this group rather than vice versa. TY will send JT business plan to show the current working plan. TY to check on terminology as it is due to be revised soon.

European work and rules of run-off on roofing materials are being revised and ICP Materials data could be relevant for this work but TY estimated that this will occur in approx. 3 years' time.

ISO 8565 is the most relevant standard to ICP Materials. The technical manual should include reference to international standards.

Possible publication events during 2017 include Eurocorr and ICC in Prague. Working party 21 cultural heritage is most relevant. (See point 9 below).

- (c) Web access and common data portal including compilation of corrosion data (*Johan Tidblad*)
www.emep.int can be used as a benchmark for the ICP Materials website.
The WGE is carrying out work on ICP group websites' convergence/modifications. No change to ICP Materials website shall occur until the WGE has completed its work.

7. Discussion of 2016-2017 work plan:

The document ECE/EB.AIR/2016/1: Draft 2016-2017 Workplan for the implementation of the Convention

(a) Quantify multi-pollutant effects on the corrosion and soiling of selected materials under different environmental conditions:

1. Collection of environmental data 2014-2015 (*Terje Grøntoft*);

It was noted that there are differences observed between local SO₂ and IVL SO₂ measurements, this is due to that the measurement methodology differs.

The NO₂ measurement differences between 2011 and 2014 need to be checked for certain sites by TG.

Site 57 is absent from the data and needs to be checked by TG.

O₃ diagrams current do not have site labels, these need to be added by TG.

A complete set of data is required by the end of 2016, with calculated annual averages. A report will be issued in 2017 (TG)

Markus Faller presented a new method of collection of environmental data current taking place in Zurich. This involved the use of a mobile laboratory placed on the roof of the city trams, which continuously analyses air content by laser diffraction. The laboratory is connected by wireless internet and reports directly to a server. More information is available via “Opensense Zurich, ETH”.

2. Discussion of evaluation of samples after the trend exposure 2014-2015 (*Johan Tidblad*):

i. Carbon steel and stainless steel (*Katerina Kreislova (KK)*)

There was a variation between the triple samples of carbon steel at sites 21, 26, 50. Site 26 was also seen to vary a lot for weathering steel.

Some samples were mixed up during the start of the trend exposure: 23 and 26 – but KK had corrected this in the results presented. KK shall double check that the results are presented correctly.

ii. Zinc (*Markus Faller*)

In the dose-response function (DRF) time is linear. Results show that the first year corrosion is slightly higher but after this the corrosion slows to a lower constant rate. Corrosion product analysis showed that organic acids played a part in corrosion process.

The question was asked whether the exposure of zinc (and other materials) needs to be modified to match the needs of industry now and in the future? Modern soiling is a different process than corrosion, but equally as important.

iii. Copper and aluminium (*Johan Tidblad*)

No comments were given on this presentation.

iv. Weathering steel (*Daniel De la Fuente (DF)*)

It was suggested that a possible publication of this data with comparison to the carbon steel data could be produced. DF and KK will cooperate on this.

- v. Limestone (*Tim Yates*)
The question of the degradation rate observed at site 23 (Birkenes, Norway) was discussed and it was hypothesised that this was due to the cold/wet climate.
- vi. Modern glass (*Aurélie Verney-Carron*)
There were no comments on this presentation.

3. Reporting and time schedule

All environmental data is due (electronically) by the end of 2016. The environmental data report is due during 2017.

The corrosion data trend analysis report is due during 2017.

All corrosion data shall be collated in a report (no analysis, only raw data) which is due by September 2016 (to include data from 2014-2015, 2011-2015).

All delegates shall send data to JT prior to the summer vacation period (prior to June 2016).

The numbering of reports shall be as follows: 78 Corrosion data; 79 Technical manual.

(b) Quantify multi-pollutant effects on the United Nations Educational, Scientific and Cultural Organization (UNESCO) cultural heritage sites (*Pasquale Spezzano (PS)*)

1. Information and discussion of call for data on inventory and condition of stock materials at UNESCO cultural heritage sites including overview of interest for participation in the call (*Pasquale Spezzano*)

To date Croatia, Germany, Italy, Norway, Sweden, and Switzerland have shown interest in the call for data.

2. Contribution from individual participants (depending on interest)

- Croatia – 6 (or 7) heritage sites are viable for the study, all of which are coastal. Split and Trogir city centres are to be included. Environmental agency data will be included. It was suggested to utilise MB as a reference when communicating with the sites. An example report was requested to help show how a report is formulated. It was suggested to define the limits of reporting (“present condition of cultural heritage site”) i.e. maximum number of pages/words required, and/or maintenance work carried out over last specified number of years. Description of the site should be in a given format. It was suggested to use the terminology “World heritage cultural site” not just UNESCO site, in order to align with current practices.
MB shall contact Pasquale with comments/improvements to the call for data documents.
- Germany – A definition of the reporting standard is required.
The Environmental Protection Agency has asked SB for help to complete the forms. It has been decided that the Swedish method of site screening will be used.
- Italy – PS presented preliminary results which showed how the sulphur content of ship fuel has influenced corrosion rates on Italian coast.

It was discussed that a timeframe of approx. 3 years is acceptable for the call for data and analysis of data received.

PS shall prepare other site examples for use as a reference (including simpler examples).

- Norway – one site has already been reported, which was presented to the group. It was described as a complex procedure to find the relevant data and to report this data in the template. It was agreed that this can be placed on the ICP Materials website as an example to others.
- Sweden – Environmental agency can only fund a small amount of the work. A first screening of sites will be performed to exclude sites not interesting regarding to air pollution. Potential objects for study will be presented to Environmental agency for further funding.
- Switzerland – Abbey of St. Gaul and Bern Minster site (sandstone) have been selected. The compiling of data is due to start soon.

3. Reporting and time schedule

The deadline for sending of data was given as the end of June 2017. This is to be altered in the documentation (JT/PS). An interim report of the data gathered is due prior September 2016. A more detailed progress report is due by the end 2017.

(c) 33rd meeting of the Programme Task Force

The next ICP Materials meeting will take place in Finland on May 10th-12th 2017 (subject to confirmation).

All delegates are requested to check their calendars for conflicting activities. (All)

8. Discussion on 2017-2018 exposure for trend analysis and medium term work plan (2018-2019).

It was decided by the group that weathering steel shall be exposed to 8 years in order to make the data comparable to earlier trend exposures.

The next exposure is due to start in 2017, and will consist of 1 + 4 year exposures, including Al, CS, Cu, Glass, possibly Stainless steel, Titanium zinc, W steel, Zn, Limestone exposures.

A discussion was had regarding the exposure of any new materials. Plaster was suggested and the type, geometry etc. was discussed. Advice from TY is required.

A discussion regarding climatic data near roads and near sources of pollution etc. was had. It was concluded that test sites nearer roads could be useful sources of data.

New test site in Croatia – at the next meeting a presentation of possible locations of test site(s) will be given. JT shall send information about the technical manual to MB.

9. Dissemination of results:

(a) Scientific publications

Weathering and carbon steel – DF and KK to organise a publication.

Eurocorr 2017 – presentation of UNESCO work possible. The 25 year report could be the basis of a new report/publication including the new trend data.

It was discussed if a publication relating to the most relevant current topics for modern corrosion – chlorides, NO_x – could be developed. No decision was taken on this.

- (b) Workshops and other ways of involving scientists outside ICP Materials;
 World Heritage sites – PS and MB to co-ordinate on this.
 SB to provide info on a relevant conference in Germany taking place in September 2017 – it may be possible to present ICP Materials there.
 Swiss conference 2018 – Three country corrosion congress. MF shall inform the members about this.

- (c) Development of web page including information on visits
 Update of contacts is required.
 Update list of reports is required.
 Update list of test sites is required.
 It was suggested that a reference list of publications could be added.

10. Financing of the programme and discussion of relevant H2020 and other European calls.
- Sweden – a 1 year contract is in place. No indication of any change to this in the short term.
 - Italy – Funding from Sweden regarding the UNESCO call for data, otherwise no funding currently.
 - Finland – No funding for ICP work, but financing is available from the University for conferences etc. which covers the costs of attending the ICP Materials meetings.
 - France – a 2 year contract is in place.
 - Switzerland – a 1 year contract is in place.
 - Germany – a 3 year contract is in place.
 - Croatia – Work in progress regarding the funding of ICP Materials work, but nothing decided as yet. There is a possibility of funding available from the Ministry of the Environment “environmental fund”.
 - Czech Republic – 1 year contract is in place with the Ministry of the Environment. This covers approximately 50% of ICP Materials costs. The remainder of the funding is covered by the Ministry of Industry projects and other industrial projects.
 - Greece – currently no funding other than from the University, which covers the ICP Materials meetings, and the analysis of the environmental data.
 - Norway – 1 year contract is in place with the Ministry of the Environment.

Tiina Vuorio presented a EU Horizon 2020 call “H2020 – improved material durability in buildings and infrastructures, including offshore”. Members should contact Tiina if they are interested in joining the application. The deadline for applications is October 2017, with an approximate project budget of €3-6m.

11. Any other business.

There were no comments for this point. The JT thanked PS for the excellent organization of the meeting.