

CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION

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

Minutes of the 27th Meeting of the Programme Task Force

April 6-8, 2011, Ministry of the Environment of the Czech Republic, Praha

Prepared by the Main Research Centre
Swerea KIMAB AB, Sweden

The twenty-seventh meeting of the Programme Task Force of the International Co-operative Programme on the Effects on Materials including Historic and Cultural Monuments was held in Prague, Czech Republic, on April 6-8, 2011. The meeting was organized by SVÚOM and hosted by the Ministry of the Environment of the Czech Republic.

The meeting was attended by representatives from the following Parties to the Convention on Long-Range Transboundary Air Pollution: Czech Republic, Estonia, Germany, Italy, Norway, Russian Federation, Spain, Sweden, Switzerland and United Kingdom.

The meeting was further attended by a representative from Japan.

1. Opening of the meeting

Jiří Hlaváček, deputy director general for international relations of the Ministry of the Environment of the Czech Republic, welcomed the meeting to Prague and the building of the Ministry of Environment. *Jiří Hlaváček* gave an overview of Czech activities in reducing air pollution, he emphasized the importance of international co-operation, the UN convention and the EU role.

Johan Tidblad thanked *Jiří Hlaváček* for the hospitality of the Ministry of Environment, welcomed everyone, especially Hidemasa Yamamoto, observer from Japan, and declared the meeting opened.

2. Information from the local organizers

Katerina Kreislova welcomed everyone and provided practical information, inviting everyone to the meeting dinner hosted by the Ministry of Environment, and to the excursion to the recently re-opened Technical Museum and its workshops.

3. Approval of Draft Agenda

Johan Tidblad presented the draft agenda which was approved.

4. Introduction

The participants of the meeting gave a brief presentation of themselves.

5. Discussion of 2010 Work plan including cycle of reporting

Johan Tidblad presented the 2010 reports for discussions.

- a) ICP Materials Report No 62: Results from the 2008-2009 trend exposure programme.

This report covers results of corrosion and soiling, forming the basis for subsequent reports from the 2008-2009 trend exposure.

The differences between glass blasted zinc specimens and specimens prepared according to the ISO standard, results from both included in the report, was discussed. It is not yet possible to draw any conclusions concerning possible use of blasted specimens (*Markus Faller*).

- b) ICP Materials Report No 63: Combined stock at risk and mapping for Italy at the national level

Stefan Doytchinov presented the report. For mapping cultural heritage, prime source of data is the risk map of Istituto Centrale per il Restauro di Roma. Since all 97 000 monuments cannot be shown in one map, they have been divided by type. Dose-response functions (DRF) have been used for stone and metal corrosion.

The “Risk Map” of Istituto Centrale per il Restauro is an information system started 20 years ago, covering risk of different types, including earth quakes, pressure from tourists etc. Corrosion is considered a risk primarily in large cities.

- c) ICP Materials Report No 64: Validity of dose-response functions for different climatic conditions

Johan Tidblad presented the report, prepared in collaboration with Daniel de la Fuente, Markus Faller and Katerina Kreislova. Independent data have been used to compare observed and predicted values. DRFs for the SO₂ dominating situation for the multi-pollutant situation have been used for the predictions.

As independent data, case studies from five geographical areas are used

- Switzerland: data used are from the 1990’s with SO₂-levels in between SO₂ dominating and not dominating. Results for weathering steel and zinc are good while higher than observed copper corrosion rates were predicted, possibly due to rough (blasted) surfaces on the material exposed.
- Spain: data from different sites have been used, using DRF for SO₂ dominating situation some cases, the multi-pollutant situation in others. Carbon steel mostly show lower predicted than observed corrosion rates. This may be due to high precipitation since half of the data from a rainy area (although with sites with highest rain eliminated). Better correlation was obtained for zinc while aluminium showed large variations.
- Czech Republic: Carbon steel showed good correlation using the SO₂-dominating function. Slightly higher rates than measured were predicted, possibly due to pollutants besides SO₂.
- United States: Data from the CULT-STRAT book for the Kitson Hiker statue was used. This is a set of statues prepared in the same way and exposed at different locations. Situations covered by the data were mainly SO₂-dominating.

- Asia and Africa: Data used are from RAPIDC. There are small differences between predicted and observed corrosion for zinc, copper, steel and painted steel. For limestone there are substantial differences, recession rates being much higher than predicted in this part of the world, with clear systematic differences.

It was discussed which functions work the best under different conditions. For limestone, the SO₂-dominating function results in too low corrosion for high temperatures. The reason for lack of agreement at high temperatures (Asia/Africa) may be that the temperature part of the current function is due to freeze-thaw cycles, it can thus not be extrapolated. For the future the functions should be revised to cover also higher temperatures. For the metals, *Johan Tidblad* concluded that DRF for SO₂ dominating situations are better for very high SO₂ levels.

Stefan Brüggerhoff suggested that part of the problem with the limestone data may be due to differences in the natural material. The original material was used in RAPIDC, after that, other sources of limestone had to be used. *Terje Grøntoft* brought up the importance of packaging, limestone, being vulnerable to chock.

- d) ICP Materials Report No 65: Economic assessment of corrosion and soiling of materials including cultural heritage.

This report is the result of a large collaborative effort, including mostly everyone: Basically it is a literature revue. *Johan Tidblad* invited ideas for possible revision of the report; a new version can be published on the internet.

- e) Updated chapter 4 of the mapping manual

The document was distributed last year. *Johan Tidblad* proposed discussing the recommendations regarding selection of functions. He proposed to add a sentence for limestone, recommended not using the limestone function for the SO₂-dominating situation for high temperatures (20-30°C).

Tim Yates emphasized the need to look at the original function and the temperature term. *Johan Tidblad* will use the files from elaborating the function based on 8 years exposure and remake the functions without the temperature term, to be tested with the data in the validation report. One way of dealing with the temperature term may be to use K instead of °C, checking the coefficient of variation. Possible synergistic effects with NO₂, transforming SO₂ to sulphide to sulphate, as seen in laboratory exposures, were discussed. So far there have been no observations of sulphide in the field and no synergistic effects from NO₂ for limestone (only for copper). It was decided not to include any changes now in the mapping manual.

- f) Approval of reports

All reports including the mapping manual have been discussed and were approved. Additional possible errata should be sent to Johan Tidblad before publishing on the ICP materials home page.

This closed discussions on work plan 2010

6. Information from WGE and common work plan items 2011

Johan Tidblad presented the 2011 Workplan for the implementation of the Convention. The plan is to be finalized, discussed and approved at the next WGE meeting. All activities are included in the same workplan, chapter 3 “Effects of major air pollutants on human health and the environment“ controls our work., paragraph 3.2. concerns ICP Materials

Paragraph 3.1. covers common items for all ICPs

(i): Implementation of Guidelines: This is covered by the regularly performed trend exposures, which includes monitoring and measurements of the key parameters indicated in the Guidelines.

(ii) Heavy metal assessment: ICP Materials has no contribution this year. In the past assessments of run-off from copper and zinc have been made.

(iii) Comparison of activities across continents and regions: Reports on the comparison of activities across continents and regions (North America, Western Europe, and South-Eastern Europe, Eastern Europe, the Caucasus and Central Asia). *Nadya Karmanova* gave a presentation on the first meeting of the EECCA (Eastern Europe, Caucasus and Central Asia) co-ordination group. One major problem can be the lack of documents translated to Russia. It is however not known if translating key documents would help involving East European countries in ICP Materials. Some documents already translated by *Nadya Karmanova*. Possibilities for further involvement of EECCA countries were discussed below under the medium term workplan and the strategy of the convention.

(iv) Report on ex post analysis by the Working Group on Effects. *Johan Tidblad* presented the WGE ex post analyses of the ICP and Task forces of WGE as compiled by the Chair of ICP modelling&mapping. The contribution from ICP Materials was approved and *Johan Tidblad* will continue to provide WGE with additional material as requested.

(v) Work pursuant to decision 2010/2 of the 28th EB Decisions and support of the revision of the multi-pollutant multi-effects protocol. By this decision a new task was added to our workplan. The decision is to include black carbon (BC) as a component of particulate matter in the process of revising the Gothenburg Protocol, to look at adverse effects of BC deposition on vegetation, soiling of materials and possible other effects. The reason for this is the link to climate change with black carbon considered important. Most important aspect would be for soiling. The task will be handled by *Johan Tidblad* and *Tiziana Lombardo*. The first step will be to present a literature review with preliminary conclusions this year and the final report next year.

Possibilities for on-line participation in future meetings. Many meetings in the Convention involve different groups of people, persons that may only be interested in half a day of a 3-5 days meeting. There has been a discussion on possibilities for on-line participation. Skype, free of charge but with some disadvantages may be used, or a service provider offering telephone conference with possibilities to show presentations from your participants computers. Special requirements apply to these meetings: meeting room suitable for the purpose and a strict agenda (keeping the time). A discussion within the group showed that this is an emerging technology with some limited experience from participants regarding the use. However, the general feeling was that this will be quickly more and more important for future meetings.

7. Discussion of 2011 Work plan and deliverables

- a) J. Tidblad, et al., Report No 66 Trends in pollution, corrosion and soiling 1987-2009, Swerea KIMAB AB, Stockholm, Sweden, 2011

The report will be based on the last trend report no 56 which included complete analyse of the trends. In the new report, data from 2008-2009 should be added, a new section on soiling trends, and a small section on black carbon.

Katerina Kreislova will elaborate carbon steel trends, comparing SO₂ and corrosion loss and in addition trends for Czech test sites.

Markus Faller will compare surface conditions for zinc, looking at old and new trend data.

Tim Yates will include stone quality for explaining error bars for limestone.

Tiziana Lombardo will report on trends in soiling.

Time plan: The final data set (annual data) will be distributed by mid May. Finalized analyses, main graphs and conclusions are required by the end of July. The final report will be compiled by the end of September. Dead-line for the finalized report is in November.

- b) T. Grøntoft, et al., *Report No 67 Environmental data report. October 2008 to October 2009*, Norwegian Institute for Air Research (NILU), Kjeller, Norway, 2011.

Terje Grøntoft presented the status for environmental data for 2008-2009 and for the trend exposures showing distribution plots with data coverage for each station. Some data is still missing: precipitation data for Italian stations 13-16 due to late release of data (data expected shortly), O₃ for one month in Prague (not available due to technical problems), SO₂ for Casaccia (no data for 2008-9 due to non functioning old equipment, other solutions have to be found), occasional losses of passive samplers etc. Spain has problems reporting ionic substances in rain for periods without rain, now reported as zero. It was decided to include in the next technical manual how to deal with periods of no rain.

Time plan:

- 1) Everyone is required to complete the Excel file with the mandatory yearly values by the end of April.
 - 2) The environmental data report should be finalized in September (absolute deadline November 2011). The report shall include comparison between passive samplers and other methods and recommendations on which of two values should be selected.
- c) S. Doytchinov, et al., *Report No 68 Pilot study on inventory and condition of stock of materials at risk at United Nations Educational, Scientific and Cultural Organization (UNESCO) cultural heritage sites*, Italian National Agency for New Technologies, Energy and the Environment (ENEA), Rome, Italy, 2011

Stefan Doytchinov presented the pilot study planned following the decision of the 26th meeting. The time plan for the study is to have preliminary results in September and a final report in November 2011. This workplan item will also be extended to 2012.

Possibilities to include sites in Paris, Prague, Berlin, City of Bath and Athens were discussed. For Paris, data elaborated in the CULT-STRAT project may be used. For Berlin, *Stefan Simon* suggested to include one of the buildings on the Museum Island, World Heritage Site since 1999. For Athens, Acropolis or the Monastery of Daphne, both UNESCO sites, were suggested, the Acropolis is however positioned on a hill with low levels of air pollution. For the UK, the Abbey in Bath or Royal Crescent with good records may be useful. For Prague, the National Library has been selected.

The same methodology has to be applied for all selected sites, one monument per country, covering corrosion and soiling effects, economic effects of restoration and proposed maintenance intervals (see the CULT-STRAT book, p.286, Table. 9.5). Photos should be taken and materials for which DR-functions exist studied. It was suggested to apply a similar methodology as elaborated in the CULT-STRAT project, applied for Villa Aldobrandini and Santa Maria della Vittoria church in Rome.

The pilot study is included as a work item for this year, a report is thus required. To include longer exposures, it will be included in the work plan also for the next year. *Johan Tidblad* expressed wishes for deeper involvement from UNESCO personnel in case studies.

What can be done during *this year* was discussed:

Parts of Paris can be part of the study, provided already existing results can be used (*Tiziana Lombardo*, not present).

Katerina Kreislova suggested the National Library in Prague, located in a wing of a former Baroque monastery by the river in the Old Town. High pollution levels from traffic were measured 3-5 years ago. Data on main building material, stone, plaster, copper roof, is likely available. It should be possible to obtain data for the building, main materials, stone, plaster, copper roof.

Stefan Simon suggested using data for selected buildings on the Berlin museum island. Materials for new museums are known. Controversial restorations of the outside of buildings, including marble, bronze and zinc sculptures, have been performed. Compilation of data is expected to be finalised by May 2011.

Tim Yates suggested using Royal Crescent, a group of buildings in Bath. The buildings are of the same age and materials (Bath stone) but at different orientation. Results from a condition survey, on cleaning and cost of maintenance is available, and the city council is interested. Further a project with Middlesex University, before CULT-STRAT, included Bath as test site for soiling. If of interest the cathedral can be included later. Bath, a former Roman settlement, has a natural hot spring, with accompanying popularity in the 18th century, since then declining. There are ongoing discussions with UNESCO on building a shopping mall in the historical area.

Stefan Doytchinov will send a template next week, on information required in order to unify site descriptions. Completed descriptions are required by the end of May. Data should be available end of June – middle of July, e.g. in the form of PP-presentation to be circulated by the end of July. Feed back is required before the Geneva meeting 24-26/9. Contributions to the report are required after the summer. Draft report(s) will be distributed by *Stefan Doytchinov* thereafter. *Stefan Brüggerhoff* suggested that the data should include reason for interventions since this will indicate the type of conservation work performed – request to be included in the template. He further pointed out that comparing between smaller restorations at regular intervals or large after longer time is of substantial interest.

- d) L. Sjögren, Documentation from the twenty-seventh meeting of the Programme Task Force, April 6-8 2011, Prague, Czech Republic (*this meeting*)

Lena Sjögren reported that minutes from this meeting, and presentations, will be posted on the project website, <http://www.corr-institute.se/ICP-Materials>. Meeting participants will be informed by e-mail as soon as the documentation is available at the website. At least one of the meeting participants would like to see a slightly more modern project website.

8. Discussion of 2012 Work plan

- a) Discussion of 2011-2012 trend exposure

- i) Reporting – updated technical manual

The technical manual for the last trend exposures was expanded including photos of test sites. For this year it is proposed to improve descriptions of the measuring methods.

Terje Grøntoft showed a table including requests for data required in relation to the glass exposures. The table includes requests for new information such as measurement frequency in order to get information about time resolution for data presented as e.g. monthly averages. Method descriptions shall be given unless standardized methods are used. It was agreed to use the suggested table, accompanied with instructions on what to put in the table, level of details etc.

Katerina Kreislova presented corrosion data for structural metals: long term corrosion and specific chloride effects, mainly from de-icing salts. Large differences in steel corrosion between the periods 1976-95 and 1996-2010, are likely attributed to differences in SO₂-concentration. For zinc corrosion is presently governed by effects of humidity and rain; sites with different SO₂-level show the same corrosion rate. For copper the SO₂ effect still dominates. Based on results shown and after discussions on the evolution of corrosion with time, the importance of including long term exposures also in the future was stressed.

Johan Tidblad suggested including environmental characterization for years 1 and 4, adapting to the periodicity of the trend exposures and based on the fact that glass samples have been exposed for 4 years. This doesn't imply any added work for the test sites, but for the sub-centres. It was decided to start exposure of two sets each of zinc and steel.

Possibilities to add also other materials, primarily the ISO 9223 materials copper and aluminium, were discussed. Copper would be a good indicator material for longer time periods (even if ISO 9223 states one year), *Katerina Kreislova* recommends to expose copper for four years, in case only one set is to be included. Aluminium would need other methods for evaluation. Also weathering steel could be of interest. According to *Daniel de la Fuente*, there are no data for this material in environments with low SO₂-levels. *Daniel de la Fuente* offered to provide specimens and serve as a sub-centre for weathering steel.

Since it has been suggested to add weathering steel, copper and aluminium, and to expose duplicate sets of zinc and steel, more space is required at the exposure sites.

Markus Faller and *Daniel de la Fuente* discussed possible problems with zinc during long term exposures at high temperatures, i.e. Spain, since the zinc use is pure it is soft and will deform with the risk of coming loose from the fixtures. Changing to a harder material, alloyed with titanium was suggested but would require parallel exposure of both materials at least for one period. It was decided not to change the zinc material but to try and adapt the fixing, to allow motions (the Spanish sites are not very windy).

ii) Environmental data and passive sampling

Martin Ferm presented passive sampling including multisampling with sulphur dioxide, acetic acid, formic acid, hydro chloric acid and hydro fluoric acid using only one sampler. Separate samplers are available for ammonia, nitrogen dioxide, ozone and nitric acid. Samplers for sulphur dioxide only are also available.

Since quite high acetic acid levels have been found earlier, *Johan Tidblad* suggested having *the whole package, not as mandatory but as a campaign*.

Tim Yates expressed interest to look for ammonia on surfaces, ammonia is reported to accelerate biological growth and may thus have an effect on stone materials. *Johan Tidblad* informed that since there is now more focus on nitrogen pollutants in Geneva, it would thus be good to include ammonia measurements.

Since ammonia pollution is a local phenomenon, motivation for measuring ammonia is lower than for acetic and formic acid. Including copper in the exposures could be a motivation to measure also ammonia.

Martin Ferm presented costs for passive sampling. Three months' sampling is suggested, although requiring improved fixation of the samplers, especially the particle collector risks blowing away. Costs for the multi-pollutant, nitrogen dioxide, ozone and nitric acid samplers would be 1 135 € per year and site with the present currency exchange rate (9,30).

Johan Tidblad reports from a project trying to use passive sampling of chlorides, possible substitute for the wet candle method. It was however found that passive samplers could not be used close to the sea, due to the wind blowing off what has adsorbed. *Martin Ferm* suggested using a wet surface to avoid reemission. Trials using a sticky surface did not succeed at low temperatures since the material went solid, sticky tape though, sticky side out, could be an option. *Dagmar Knotková* pointed out that changing the method would mean that results obtained cannot be compared with old results, since the results obtained are very much dependent on the method used. *Martin Ferm* suggested using the same diameter and length as in wet candle. It would be interesting to compare samplers of new design with the presently available Teflon samplers.

iii) Corrosion and soiling exposures (*All & Subcentres*)

Ott Roots reported problems with the new minister deciding there will not be any financing from the ministry for this trend exposure. The new main priority is hazardous substances. There are however hopes to be able to participate in the trend exposure starting in three years.

Johan Tidblad pointed out that, possibilities to obtaining data should be an important criterion when selecting sites for additional exposures. Stations providing all environmental data should be selected for the four year exposures and for exposing weathering steel, copper and aluminium. The first aim should be to use all test sites for the additional materials. *Johan Tidblad* will recommend test sites in cases all test sites cannot be used. As for weathering steel, one year exposure is considered to short, four or seven years should be used.

For this trend exposure the aim shall be to start the first of October, allowing a few days differences for countries managing several sites. The sub-centres should notify by mail when the samples are sent and when they are received.

b) The 2008-2012 soiling exposure programme and reporting (*Tiziana Lombardo*)

The soiling exposure programme is ongoing, managed by *Tiziana* and the withdrawal of the 4-year samples will coincide with the withdrawal of the 2011-2012 trend exposure.

Johan Tidblad showed a presentation on soiling trends, a presentation elaborated from *Aurélie Verney-Carron* and *Tiziana Lombardo*, managing the soiling exposure programme.

All three parameters included in the dose-response function for modern glass (SO_2 , NO_2 and PM_{10}) have decreased by 20% between the 2005/06 and the 2008/09 trend exposures, so should soiling if the DRF are correct, this decrease is however only about 10%. Improvements of the DRF are in progress, starting with effects of SO_2 . Trials have been made using ANN (artificial neural networks) but using a power law function works better. *Tim Yates* stressed the importance of having a good distribution of sites, otherwise data points at the end of the distribution will have too large effect in the statistical analyses. *Tim* recommended adding a note on outliers, where they are from, possible special conditions etc.

The work plan for soiling 2011-2013 is to contribute to report no 66 and, if data are available, to the pilot study, report no 68. Some conclusions on black carbon are required already this year, a report is required 2012 based on literature data and ongoing exposures. In 2013 there should be a report on the exposure of modern glass 2008-2012, including elaboration of soiling DRF.

The black carbon issue was discussed further. *Martin Ferm* informed that the standard measurement method is collection through paper filter and measuring reflection. Results are presented as particulate matter in micrograms per m³, using a relation valid in the 1960's, the relation between carbon and particulate matter has changed much since. *Tim Yates* mentioned effects on stone observed in the 50's and 60's, when high levels of SO₂ attacked the surface dissolving black carbon into the surface, building a 2-3 cm black crust. Under the present European situation, for stone and glass, the sole effect expected is soiling. *Katerina Kreislova* suggested possible influence of black carbon on time of wetness in combination with chemical effects for metals. Information on possible effects, other than soiling, from black carbon is requested, information to be co-ordinated by Johan Tidblad and Terje Grøntoft.

c) 28th meeting of the Programme Task Force

Kostas Varotsos has volunteered to host the next task force meeting. The meeting will be held Wednesday – Friday, 18-20 April, 2012, in Athens (subject to confirmation).

d) Others

Stefan Doytchinov suggested to extend the UNESCO study as stated in paragraph 7c), adding a report for 2012.

Terje Grøntoft informed on the elaboration of chapters on economical in a book, presently under review, to be included as a reference in our reports. He will send the reference to Johan Tidblad.

The final recommendation for the 2012 work plan is thus:

- (a) Report on technical procedures (technical manual) for the 2011-2012 exposure programme for trend analysis;
- (b) Report on pilot study on inventory and condition of stock of materials at risk at United Nations Educational, Scientific and Cultural Organization (UNESCO) cultural heritage sites. Part II.;
- (c) Report on the effect of black carbon (BC) on soiling of materials;
- (d) The twenty-eight meeting of the Programme Task Force, tentatively scheduled for April 18-20 2012 in Athens, Greece, and the submission of its report.

9. Strategy of the Convention

Johan Tidblad presented a summary of the draft long-term strategy for the Convention on Long-range Transboundary Air Pollution, the first long-term strategy for the Convention. The strategy includes a vision for the next 10 years and possible developments up to year 2050. Important points of the strategy are that the effects-oriented approach will remain essential components, user-friendly indicators are requested as well as the active participation of EECCA countries.

We should take advantage of co-benefits in combating air pollution and climate change, concentrating on SLCFs (short lived climate forcing pollutants). The direction should be on pollutants that are best controlled at a regional level, not so much on acidifying pollutants.

As for the EECCA countries, the meeting identified countries that should be contacted for involvement into ICP Materials at the first stage: Belarus, Ukraine, Kazakhstan and Moldova. Nadya Karmanova and Ott Roots have some contacts. The next step will be to identify persons that can participate in exposures. It is also necessary to have contact with someone at the ministries. Everyone with contact persons in these countries are requested to send this information to Nadya Karmanova.

10. Medium term work plan (2013 and beyond)

Besides the technical manual and soiling report on black carbon, the second part of the UNESCO-study should be included in the 2012 work plan. After the study, UNESCO will be contacted to try and start a dialogue, possibly giving new ideas (Stefan Doytchinov). For 2013 the work plan includes results from the trend exposure and a soiling report with dose-response functions. For 2014 there should be a report on trends in pollution, corrosion and soiling 1987-2012 and the 2014-15 should be started, hopefully with the participation of four EECCA countries as indicated above.

Johan Tidblad would like to see new ideas for more “user-friendly effect indicators”. The indicators should preferably be visual and cheap: pictures instead of graph, loss of energy production from soiled solar panels are two suggestions.

11. Publication of results

Johan Tidblad presented an invitation from the Pollution and Environment conference in the Czech Rep. in May 2011. Other possibilities are to contribute to a special issue on atmospheric corrosion in the International Journal of Corrosion, manuscript due the first of August 2011 and Eurocorr in September 2011 in Stockholm. Some of the participants will participate in the latter.

Possible themes for common publications were discussed. *Martin Ferm* suggested including corrosion in publications of the reduction in nitric acid, looking at NO₂ and O₃ as precursors. One suggestion is to submit two publications, one focused on environmental issues and one more traditional paper from the group showing trend results etc. The different possibilities, stand alone publication from the group, papers presenting parts of the results, basically publishing report 56 in order to increase spread, elaborating a reference book with data. It would be advantageous to be able to make data available to others without losing the right of the persons producing the data or whoever owns the data. Even if all international programmes tend to publish a book, publishing data on the internet would result in larger spread, e.g. as "ICP Materials" in Wikipedia.

It was decided to publish a paper in the International Journal of Corrosion and to look further into common dissemination. As a first step, everyone shall be contacted concerning possible restrictions for environmental data. *Johan Tidblad* volunteered as leader for the paper, with assistance from *Martin Ferm*. *Johan* will also start looking at Wikipedia article(s), all others are encouraged to contribute. As for the ICP Materials website, KIMAB was encouraged to update it, even if the design was updated three years ago.

12. Financing of the programme - including possibilities for adding analysis of organic acids/ammonia 2012-2013

(Use more expensive passive sampler / adding passive sampler? 1300/380 for one sample.)

Round the table presentation of financial issues for the next years:

In Sweden, yearly financial contributions are obtained from the Swedish Environmental Protection Agency. Using additional funding, it will be possible to include organic acids at the Swedish test sites.

In the Czech Republic yearly funding is obtained from the Ministry of the Environment, no problems for sample preparation and exposure are foreseen. It is also likely that passive samplers can be used.

For Norway, the same financing as earlier is expected. Unless there will be dramatic changes in the financial situation, passive samplers can be included.

Funding to cover some Russian activities is expected, the extent is however not known.

A four year contract for Spanish activities is under preparation, exposure of weathering steel will be included.

There will be no funding for Estonian activities; hopefully this will change in the future, allowing participation in the trend exposure to be started in three years time.

Running the Swiss test site and the subcenter for zinc is financed.

No problems are foreseen for the German activities since the environmental agencies are now becoming familiar with our work. New racks are being built in a new way, these should last for the next 30 years.

There will be no government funding for UK activities. There are however other sources, allowing some of the work to be done. Whether or not it will be possible to include four year exposure at Lincoln Cathedral is yet unknown. One year exposure will be performed including passive samplers.

One of the Italian stations has been moved to the nuclear plant at ENEA. The funding needed is secured since the stations are run by other organizations. The racks of three stations have been exchanged, Casaccia remains with poor rack.

13. Any other business

No other business was reported

14. Final remarks and closure of the meeting

Johan Tidblad thanked Katerina Kreislova for organizing the meeting and all participants for their contribution and closed the meeting.

Participant list

Mrs Katerina Kreislova
SVUOM Ltd.
U Mestanského pivovaru 934 /4
CZ-17000 PRAHA 7
Czech Republic
+420 2 20 80 9996
kreislova@svuom.cz

Mrs Alena Koukalová
SVUOM Ltd.
U Mestanského pivovaru 934 /4
CZ-17000 PRAHA 7
Czech Republic

Mrs Dagmar Knotkova
SVUOM Ltd.
U Mestanského pivovaru 934 /4
CZ-17000 PRAHA 7
Czech Republic

Ms. Barbora Cimbalnikova
Ministry of Environment of the Czech Republic
Vršovická 1442/65
Praha 10, 100 10
Útvar: oddělení spalovacích zdrojů a paliv (782)
+420 2 67 12 2859
Fax: +420 2 67 12 6859
Barbora.Cimbalnikova@mzp.cz

Mr Ott Roots
Estonian Environmental Research Centre
Marja Str. 4D
10617 Tallinn
Estonia
+372 611 2964
ott.roots@klab.ee

Mr Stefan Brüggerhoff
Fachbereich Denkmalschutz und Materialkunde
Deutsches Bergbau – Museum Bochum
Herner Straße 45, 44787 Bochum
Germany
+49 234 968 4032/4031
stefan.brueggerhoff@bergbaumuseum.de

Mr Stefan Simon
Rathgen Forschungslabor – Staatliche Museen zu Berlin
Schloßstraße 1a, 14059 Berlin
Germany
+49 30 3267 490
s.simon@smb.spk-berlin.de

Mr Stefan Doytchinov
ENEA, Environmental Department
Via Angvillarese, 301
00123 – Rome
CR Casaccia
Italy
+39 06 3048 3972
doytchinov@casaccia.enea.it

Mr. Hidemasa Yamamoto
Environment Management Bureau,
Ministry of the Environment, Japan
1-2-2 Kasumigaseki, Chiyoda-ku
Tokyo 100-8975 JAPAN
+81 3 3581 3351 ex6560
HIDEMASA_YAMAMOTO@env.go.jp

Mr Terje Grøntoft
NILU - Norwegian Institute for Air Research
P.O.Box 100, N-2007 Kjeller
Norway
+47 63 898 023
teg@nilu.no

Mrs Nadya Karmanova
International cooperation section
JSC "SRI Atmosphere"
7, Karbyshev st.
St. Petersburg, 194021
Russian Federation
+79210981998
karmanva.nadezhda@rambler.ru

Mr Daniel de la Fuente
CENIM – National Centre for Metallurgical Research
Avda Gregorio del Amo 8
28040 Madrid
Spain
+34 91 553 8900
delafuente@cenim.csic.es

Mr. Martin Ferm
Swedish Environmental Research Institute Ltd. (IVL)
Box 5302
400 14 Göteborg
+46 31 725 6224
martin.ferm@ivl.se

Mr Johan Tidblad
Swerea KIMAB AB
P. O. Box 55970
SE – 10216 Stockholm
Sweden
+46 8 674 1733
johan.tidblad@swerea.se

Mrs Lena Sjögren
Swerea KIMAB AB
P. O. Box 55970
SE – 10216 Stockholm
Sweden
+46 8 674 1734
lena.sjogren@swerea.se

Mr Markus Faller
EMPA - Metallic Materials
Ueberlandstrasse 129
CH-8600 Dübendorf
Switzerland
+41 1 823 4236
+41 1 823 4015
markus.faller@empa.ch

Mr Tim Yates
Building Research Establishment Ltd., BRE
Bucknalls Lane,
Watford WD25 9XX
United Kingdom
+44 (0)1923 664 341
yatest@bre.co.uk