



**CONVENTION ON LONG-RANGE TRANSBOUNDARY AIR POLLUTION**  
**International Co-operative Programme**  
**on**  
**Effects on Materials, including Historic and Cultural Monuments**

MINUTES OF THE EIGHTEENTH MEETING OF THE PROGRAMME TASK FORCE  
May 13-14, 2002, Kjeller, Norway

Prepared by the Main Research Centre,  
Swedish Corrosion Institute, Sweden

- 1 The eighteenth 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 Kjeller, Norway from June 13 to 14, 2001. The meeting was held in the premises of the Norwegian Institute for Air Research (NILU), who hosted the meeting.
  
- 2 The meeting was attended by representatives from the following Parties to the Convention on Long-Range Transboundary Air Pollution: Austria, Canada, Czech Republic, Estonia, Finland, France, Germany, Israel, Italy, Norway, Poland, Russian Federation, Sweden, Switzerland and the United Kingdom. In addition, representatives from Working Group on Effects (WGE) were present.
  
- 3 The meeting was introduced by Mr Geir Endregaard and Mr Jan Henriksen on behalf of the Norwegian Institute for Air Research (NILU). Mr V. Kucera chaired the meeting.
  
- 4 The main items discussed at the meeting were:
  - a) Discussion on results and analyses from the multipollutant exposure programme
  - b) Discussion on one-year extension of the multipollutant exposure programme to include a new set of materials and additional environmental parameters based on a EU 5FP research proposal
  - c) Discussion on the use of results for mapping and calculation of costs
  - d) Substantive report (2004) on the assessment of present air pollution effects and their recorded trends.
  - e) Workshop on Heavy Metals (2003) and discussion of need of further activities in this field
  
- 5 Discussion on results from the multipollutant exposure programme
  - a) *Measurements and reporting of environmental data*

The reporting of the last environmental data for the multipollutant exposure programme was discussed. It is essential that all data available at that stage be reported to the environmental sub-centre on October 15, 2002. This is especially important for the parameters temperature, relative humidity, SO<sub>2</sub> concentration, NO<sub>2</sub> concentration, O<sub>3</sub> concentration, amount of precipitation and pH of precipitation. If one of these parameters is missing for a site it is not

possible to perform a complete statistical analysis and there is a significant risk that the corrosion results from the site can not be used to its full potential. The new form for reporting data, 'ece-form.xls', should be followed. Only monthly data should be reported and it is the responsibility of the respective national contact persons to calculate monthly values based on the available data. It should be stressed that a month without precipitation should be reported with a '0' and not a missing value.

*b) Presentation and discussion of results of corrosion attack after 1, 2, 3 and 4 years of exposure including trend exposures.*

Each sub-centre gave during the meeting a short oral presentation of results obtained. The results of all materials show a marked decreasing trend compared to the 1, 2, and 4-year exposures started in 1987 but the corrosion rates in urban areas are still significantly higher than in rural areas. Not all results were complete since several sub-centres reported missing samples that should have been withdrawn in the end of 2001 and at this stage (May 14, 2002), samples were missing from the following sites:

Site 13 Rome

Bronze, copper, glass, zinc, limestone and painted panels after 4 years of exposure.

Site 14 Casaccia and site 47 Los Angeles

Glass after 4 years of exposure

Site 31 Madrid and Site 33 Toledo

Trend samples for zinc (to Switzerland) and limestone.

Site 49 Antwerpen

Bronze, copper, glass, zinc, limestone and painted panels after 4 years of exposure and Trend samples for zinc (to Switzerland) and limestone.

It should also be noted that the sites in Netherlands (17-20) and 42 Athens have been terminated and that no samples should be expected from them.

The results of sheltered zinc after 1, 2, and 4 years of exposure were discussed and it was concluded that only the 4-year values could be used in the statistical analysis. The one-year exposure was too short to eliminate influence of the surface preparation procedure, and the 2-year values were unexpectedly high, possibly due to uneven wet/dry conditions within the box.

6 Discussion on one-year extension of the multipollutant exposure programme to include a new set of materials and additional environmental parameters based on a EU 5FP research proposal

The one-year exposure is planned to start in October-November 2002 and is also part of the EU 5FP MULTI-ASSESS project, where it is referred to as WP3 "Broad field exposure". However, it should be emphasised that the exposure is part of the UN/ECE ICP Materials and it is therefore essential that letters and proforma invoices included in the packages when sending samples from sub-centres to participants explicitly refers to the UN/ECE ICP Materials project.

The extension will aim particularly at the assessment of effects of particulates and HNO<sub>3</sub>, which will be measured by passive samplers on a bi-monthly basis. This will require that samplers be exchanged each second month for each site participating in the project for a total period of one year.

A complete technical manual describing the details of the extended exposure, including a list where specimens and passive samplers should be sent and handling instructions, will be distributed to all participants before the start of the exposure.

## 7 Discussion on the use of results for mapping and calculation of costs

### *a) Plans for creation of a new sub-centre for stock-at-risk and cultural heritage in Italy*

The work of ICP Materials has resulted in dose-response functions describing the deterioration of materials as function of pollution and meteorological parameters and in assessment of trends of pollution and deterioration of materials in Europe. The ICP Materials stands now before the task to implement these important results in the Convention work especially concerning future revision of protocols on reduction of emissions. An important task in this respect is mapping of areas of increased risk for deterioration of materials and especially calculation of cost caused on materials and objects of cultural heritage.

In the cost calculations the assessment of the stock at risk is a crucial moment especially for objects of cultural heritage, where so far very limited systematic work has been performed. During the last meeting of the UN ECE Working Group on Effects in Geneva in August 2001 special efforts were requested in this field from ICP Materials. In the subsequent discussion it was proposed to create a new research sub-centre for assessment of stock at risk and damage on cultural heritage. Taking into account that about 70% of the European cultural heritage objects are situated in the territory of Italy, and that significant work on this subject has been performed in Italy ([www.icr.arti.beniculturali.it](http://www.icr.arti.beniculturali.it)), it would be a great advantage if the new research sub-centre would be organised by Italy.

Italy has actively participated in the work of ICP Materials from 1985 with running exposure on 4 test sites in Rome, Cassacia, Milano and Venice. The organisation responsible for the work has been ENEA and the national contact person Dr. Stephan Doytchinov.

The Italian Ministry for the Environment and Territory has kindly expressed its willingness to accept to organise the activity with the technical support of ENEA.

It is planned that the sub-centre, which would initially provide an effort of 2 manyear/year for three years covered by national financing, will start officially after the formal approval of the Working Group on Effects at its meeting in August 2002. The broader international activities initiated by the sub-centre will request other financial sources and one of the main aims of the sub-centre will be to present a plan of international activities/projects on inventories, mapping and cost and their financing. In line with this it was decided to submit an expression of interest to be included into the network of Excellence Science and Technology for the Cultural Heritage (net Ex-CH) into the research area 1.2 Informational Society Technologies of the 6-th Framework Plan.

A detailed work plan of the sub-centre will be presented at the next meeting of the programme Task Force.

*b) Mapping activities, assessment of stock at risk and cost-benefit analysis in participating countries*

The successful implementation of mapping activities in the individual countries, and their continued integration over the UN/ECE region, is one of the important steps in the process of incorporating the effects of materials including cultural heritage in the future Convention policy and EU Directives.

Mapping activities in Germany, Norway, France, Sweden, Czech Republic, the European territory of Russia and of the Nickel region near the Russian-Norwegian border were presented.

Interpolation of data with Kriging was discussed and Mrs Anda Ionescu of the Université Paris XII, who is an expert in this field, offered to provide advice for those within the group dealing with Kriging.

8 Substantive report (2004) on the assessment of present air pollution effects and their recorded trends.

In connection with the review of the 1999 Gothenburg Protocol to Abate Acidification, Eutrophication and Ground-level Ozone, and as a supporting document, a substantive report on the assessment of present air pollution effects and their recorded trends will be produced and all ICPs will be asked to prepare a contribution. This is an important report that will summarise the present state of the knowledge and results from the programme.

9 Workshop on Heavy Metals (2003) and discussion of need of further activities in this field.

A draft of the first circular was presented and discussed. The UN/ECE Workshop on "Release of Heavy Metals due to Corrosion of Materials" will be held 12-14 May 2003 in Munich, Germany in connection with the 19<sup>th</sup> meeting of the programme Task Force, scheduled at 8-9 May, 2003. The workshop will be organised jointly by Umweltbundesamt, Berlin, Bayerisches Landesamt für Denkmalpflege, München and the Swedish Corrosion Institute, Stockholm, Sweden. It is the intention that the 1<sup>st</sup> circular could be distributed in the fall of 2002. It should be emphasised that not only corrosion of metals will be included and that stakeholders from the industrial sector will also be invited.

10 Reporting from ICP Materials to the Working Group on Effects

The technical report 2002, "Results after 4 Years of Exposure in the Multipollutant Programme and Future Developments of the Programme", was prepared shortly after the meeting by the main research centre in co-operation with the sub-centres and sent to WGE (enclosed).

## 11 Rules for publication and data release

The rules have not changed since the fourteenth meeting of the Programme Task Force May 27-29, 1998, Berlin, Germany, and the full list of rules are given in the minutes of that meeting. In practice this means that the results from the original programme are official but that the results from the multipollutant programme should first be evaluated and considered for publication by the respective sub-centres and then by the Task Force before releasing the data.

## 12 Next meeting

The nineteenth meeting of the Programme Task Force will be held in Munich, Germany, May 8-9, 2003 (subject to confirmation).

## 13 Extension of time schedule (active partners underlined)

*October 15, 2002*

All: Final data call to be included in the environmental database for the multipollutant programme. Data are to be sent to the environmental sub-centre.

*October-November 2002*

All: One-year extension of the multipollutant exposure programme including exposure of new materials and measurements of environmental parameters.

*April 30, 2003*

Sub-centres: Draft reports to be distributed to all members prior to the meeting, evaluation of data from multi-pollutant programme after 4 years of exposure, trend analysis, environmental data, etc.

*May 8-9, 2003*

All: Nineteenth meeting of the Programme Task Force, Munich, Germany.

*May 12-14, 2003*

All: UN/ECE Workshop on release of metals from materials to the environment, Munich, Germany.

## 14 Address list

The updated address list is shown in Annex 1

Annex 1 - Updated address list, Thursday May 16, 2002.

Austria

Mr. Manfred Schreiner  
Institute of Sciences and Technologies in Art, Academy of Fine Arts  
Schillerplatz 3  
A-1010 Wien

Phone: +43 1 58816 200  
Fax: +43 1 58816 121  
E-mail: mschreiner@fch.akbild.ac.at

Mr. Michal Melcher  
Institute of Sciences and Technologies in Art, Academy of Fine Arts  
Schillerplatz 3  
A-1010 Wien

Phone: +43 1 58816 206  
Fax: +43 1 58816 121  
E-mail:

Canada

Mr. Jean-Jacques Hechler  
61 Oakland Avenue  
Westmount (Quebec)  
Canada H3Y 1P1

Phone: +1 514 4865 238  
E-mail: hechler@sympatico.ca

Czech Republic

Mrs. Katerina Kreislova  
SVUOM Ltd.  
U Mestanského pivovaru 934 /4  
CZ-17000 PRAHA 7 Prague

Phone: +420 2 20 80 99 96  
Fax: +420 2 20 80 19 62  
E-mail: kreislova@mbox.vol.cz

Finland

Mrs. Tuija Kaunisto  
VTT Industrial Systems  
P.O.Box 1704  
FIN-02044 Espoo

Phone: +358 9 4565 435  
Fax: +358 9 4567 010  
E-mail: tuija.kaunisto@vtt.fi

France

Mr. Roger-Alexandre Lefèvre  
LISA - Université Paris XII  
Avenue du Général de Gaulle 61  
F-94010 Créteil

Phone: +33 1 4517 1676  
Fax: +33 1 4517 1675  
E-mail: lefevre@lisa.univ-paris12.fr

Mrs. Anda Ionescu  
CERTES - Université Paris XII  
Avenue du Général de Gaulle 61  
F-94010 Créteil

Phone: +33 1 4517 1674  
Fax: +33 1 4517 1675  
E-mail: ionescu@univ-paris12.fr

Mrs. Anne Chabas  
LISA - Université Paris XII  
Avenue du Général de Gaulle 61  
F-94010 Créteil

Phone: +33 1 4517 1674  
Fax: +33 1 4517 1675  
E-mail: chabas@lisa.univ-paris12.fr

Germany  
Mrs. Anke Doktor  
Bayerisches Landesamt für Denkmalpflege, Dept. R/ZL  
Hofgraben 4  
D-80539 München

Phone: +49 89 2114 324  
Fax: +49 89 2114 300  
E-mail: anke.doktor@gmx.de

Mrs. Birgit Singer  
Bayerisches Landesamt für Denkmalpflege, Dept. R/ZL  
Hofgraben 4  
D-80539 München

Phone: +49 89 2114 322  
Fax: +49 89 2114 300  
E-mail : birgit.singer@bldf.bayern.de

Mr Stephan Fitz  
Umweltbundesamt  
Postfach 330022  
D-141 91 Berlin

Phone: + 49 30 8903 2199  
Fax: + 49 30 8903 2285  
E-mail: stephan.fitz@uba.de

Italy  
Mr. Stephan Doytchinov  
ENEA - Environmental Department  
301 S.P. Anguillarese, Santa Maria di Galeria, P.O.Box 2400  
I-00100 Rome, CR Casaccia

Phone: +39 06 3048 3972  
Fax: +39 06 3048 6487  
E-mail: doytchinov@casaccia.enea.it

Mr. Franco De Santis  
CNR-IIA  
Via Salaria Km. 29.3, CP10  
00016 Monterotondo Scalo (Roma)

Phone: +39(0)6-90672263  
Fax: +39(0)6-90672660  
E-mail: [desantis@iia.mlib.cnr.it](mailto:desantis@iia.mlib.cnr.it)

Poland  
Mrs Joanna Kobus  
Institute of Precision Mechanics  
Duchnicka 3  
01-796 Warsaw

Phone: +48 22 5602847  
Fax: +48 22 663 43 32  
E-mail: [asia@imp.edu.pl](mailto:asia@imp.edu.pl)

Russian Federation  
Mr Vladimir Dolin/Mr. Alexander Mikhaylov\*  
Institute of Physical Chemistry  
Academy of Sciences  
31 Leninski Prospect  
Moscow 117915

Phone: +7 095 330 1501  
Fax: +7 095 334 9805

\*Mr. Alexander Mikhaylov  
Swedish Corrosion Institute  
Kräftriket 23  
SE-104 05 Stockholm  
Sweden

Phone: +46 8 674 1768  
Fax: +46 8 674 1780  
E-mail: [am@corr-institute.se](mailto:am@corr-institute.se)

Sweden  
Mr. Vladimir Kucera (Chairman)  
Swedish Corrosion Institute  
Kräftriket 23  
SE-104 05 Stockholm

Phone: +46 8 674 1725  
Fax: +46 8 674 1780  
E-mail: [vk@corr-institute.se](mailto:vk@corr-institute.se)

Mr. Johan Tidblad (Head of Programme Centre)  
Swedish Corrosion Institute  
Kräftriket 23  
SE-104 05 Stockholm

Phone: +46 8 674 1733  
Fax: +46 8 674 1780  
E-mail: [jt@corr-institute.se](mailto:jt@corr-institute.se)



Mr. Farid Samie  
Swedish Corrosion Institute  
Kräftefriktet 23  
SE-104 05 Stockholm

Phone: +46 8 674 785  
Fax: +46 8 674 1780  
E-mail: farid.samie@corr-institute.se

Mr. Martin Ferm  
IVL Swedish Environmental Research Institute Ltd.  
(Dagjämningsgatan 1)  
P.O. Box 47086  
SE-40258 Göteborg

Phone: +46 31 725 6224  
Fax: +46 31 725 6290  
E-mail: martin.ferm@ivl.se

Switzerland  
Mr. Markus Faller  
EMPA - Corrosion/Surface Protection  
Ueberlandstrasse 129  
CH-8600 Dübendorf

Phone: +41 1 823 4236  
Fax: +41 1 823 4015  
E-mail: markus.faller@empa.ch

United Kingdom  
Mr. Tim Yates  
BRE-Building Research Establishment, Ltd.  
Garston  
Watford WD25 9XX

Phone: +44 1923 664 341  
Fax: +44 1923 664 786  
E-mail: yatest@bre.co.uk

Mr. John Watt  
Middlesex University  
Bound sGreen Road  
London N11 2NQ

Phone: +44 208 362 6822  
Fax: +44 208 411??  
E-mail: j.watt@mdx.ac.uk

Mrs. Samantha O'Hanlon  
Middlesex University  
Bounds Green Road  
London N11 2NQ

Phone: +44 208 362 5964  
Fax: +44  
E-mail: sam15@mdx.ac.uk

Greece  
Mr. Costas Varotsos  
University of Athens Department of Applied Physics  
Panepistmioupolis Build. Phys-5  
15784 Athens, Zografou

Phone: +30 1 727 6838  
Fax: +30 1 729 5281  
E-mail: kvarots@cc.uoa.gr

Latvia  
Ronalds Lusis  
Riga Technical University, Faculty of Material Science and Applied Chemistry  
Centre for Conservation and Restoration of Stone Materials  
Azenes str. 14/24  
1048-Riga

Phone: + 371 74 73 895  
Fax: + 371 782 0094  
E-mail: reigan@hotmail.com

Mrs. Reet Talkop  
EEIC-Estonian Environment  
Information Centre, MoE  
Mustamäe Tee 33  
10616 TALLINN  
Estonia

Phone: +372 67 37 578  
Fax: +372 65 64 071  
E-mail: reet.talkop@ic.envir.ee

Norway  
Mr. Jan Henriksen  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 162  
Fax: +47 63 898 050  
E-mail: jan.fredrik.henriksen@nilu.no

Mrs. Linn Bryhn Jacobsen  
Norwegian Pollution Control Authority  
P.O. Box 8100 Dep  
N-0032 Oslo

Phone: + 47 2257 3400  
Fax: +47 2267 6706  
E-mail: linn.bryhn-jacobsen@sft.no

Mrs. Elin Dahlin  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 161  
Fax: +47 63 898 050  
E-mail: emd@nilu.no

Mr. Odd Anda  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 163  
Fax: +47 63 898 050  
E-mail: oa@nilu.no

Mrs. Kari Arnesen  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 031  
Fax: +47 63 898 050  
E-mail: ka@nilu.no

Mr. Thor Ofstad  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 116  
Fax: +47 63 898 050  
E-mail: to@nilu.no

Terje Grøntoft  
NILU - Norwegian Institute for Air Research  
P.O.Box 100  
N-2027 Kjeller

Phone: +47 63 898 023  
Fax: +47 63 898 050  
E-mail : teg@nilu.no

Receive information

Mrs Ulla Bertills  
Swedish Environmental Protection Agency  
Blekholtsterrassen 36  
SE - 106 48 Stockholm  
Phone: +46 8 698 1502  
Fax: +46 8 698 1584  
E-mail: ulla@environ.se

Mr. Tor Johannessen  
Norwegian Pollution Control Authority  
P.O. Box 8100 Dep  
N-0032 Oslo  
Phone: + 47 2257 3400  
Fax: +47 2267 6706  
E-mail: tor.johannessen@sft.no

Mr Beat Achermann  
Swiss Agency for the Environment, Forests and Landscape  
Air Pollution Control Division  
CH - 3003 Bern  
Switzerland  
Phone: + 41 31 322 9978  
Fax: + 41 31 324 0137  
E-mail: beat.achermann@buwal.admin.ch

Mr Radovan Chrast  
UN Economic Commission for Europe  
Environment and Human Settlements Div.  
Palais des Nation  
CH-1211 Geneva 10, Switzerland  
Phone: +41 22 917 2358  
Fax: +41 22 907 0107  
E-mail: Radovan.Chrast@UNECE.ORG

Heinz-Detlef Gregor  
Federal Environmental Agency  
P.O. Box 330022  
D-14191 Berlin  
GERMANY  
Tel: +49 30 8903 2846  
Fax: +49 30 8903 2285  
e.mail: heinz-detlef.gregor@uba.de

Vladimir Bashkin  
Institute of Basic Biological Problems  
Russian Academy of Sciences  
Pushchino  
Moscow region 142292  
RUSSIAN FEDERATION  
Tel: (007 0967) 73 38 45  
Fax: (007 0967) 79 05 32  
e.mail: bashkin@rc.ru

Ramon Guardans  
DIAE/CIEMAT  
Av. Complutense 22  
Madrid 28040  
SPAIN  
Tel: +34 91 3466 711  
Fax: +34 91 3466 005  
e.mail: guardans@ciemat.es  
ramon.guardans@soundplots.com