

History of SAMCO Events

Within the framework of SAMCO project 1 Kick-Off Meeting, 12 Workshops and 2 Summer Academies were held in order to bring together top experts in structural assessment, monitoring and control from all over the world and to build connections across the borders.



The **1st SAMCO Workshop** was held in Como / Italy in April 2002, half a year after the **SAMCO Kick-Off Meeting in Assisi**. 22 persons attended this first workshop of which the main subjects were the Progress of the SAMCO activities as well as the 6th Framework Programme. Further the NEES Project was touched on and a prototype of the SAMCO Database was launched.



The **2nd SAMCO Workshop**, held in Brussels dealt mainly with the topics Monitoring and Assessment, Seismic Assessment and Active Control. The basic idea was to disseminate information about the SAMCO network, show recent research work in the field and

stimulate a discussion on new projects to be submitted within the 6th framework programme.

One year after the first workshop the **3rd SAMCO Workshop** took place in Vienna / Austria where the proposed integrated project E-MOI and its sub-projects, in particular the items determination of the final consortium, financial allocation within the project and definition of detailed objectives were discussed.



The **4th SAMCO Workshop** was the **1st International Summer Academy** on Structural Assessment, Monitoring and Control. It was a One-Week-Event in July 2003 at the Robinson College of Cambridge University.



About 90 persons from 22 countries participated in the event, 37% of them came from industry; the others were researchers and students. The first Summer Academy was a great success for the SAMCO network. The way of dealing with subjects in longer presentations was unique and provided unusual quality of information transfer. The collected contributions were outstanding and provided a very good insight into the current practice in the field.

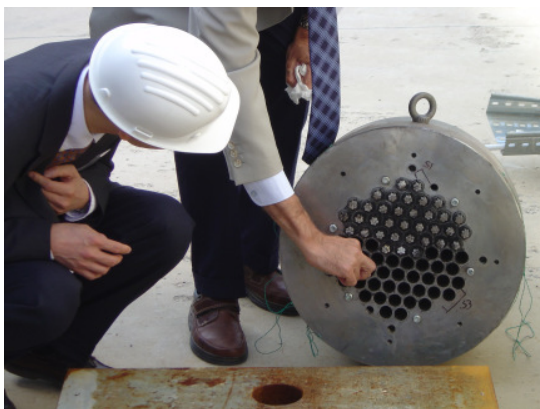


The main topics of the **5th SAMCO Workshop** taking place in Vienna / Austria were the SAMCO progress, the second call of NMP under the Sixth Framework Programme as well as a range of proposals for projects within the framework of SAMCO, introduced by SAMCO members and partners.

In April 2004 the **6th SAMCO Workshop** was held in Warsaw / Poland. This was the first NAS (Newly Associated States) Workshop in the History of SAMCO. The aim of the Workshop was at first to bring together experts in structural assessment, monitoring and control from Poland and the former EU member states to build connections and to inform each other about the state-of-the-art in bridge monitoring.



The **7th SAMCO Workshop** took place in June 2004 in Rome / Italy. In the course of the workshop a view on SAMCO covering the entire positive and negative sides of the network as well as suggestions how to improve the cooperation were presented. At this it was mentioned that SAMCO had a good core group, however the role of women might be enhanced to become equal. Further a connection to environmental and social sciences would be desired, items which were briefly discussed with the will to seize those suggestions. Some of the requests have already been covered by I-SAMCO.



The **8th SAMCO Workshop** in September 2004 was the “Harmonization Workshop” in Ispra / Italy with the aim to enable international collaboration, harmonise communication and standardise data and protocols. The intention was to invite

researchers from Europe, America and Asia dealing with experimental data to give presentations on the subject explaining the current practice of their regions. Each presentation was followed by an in depth discussion on a probable global format to be proposed and standardised. The workshop ended in a resolution on international collaboration, comprising a roadmap for data format standardisation, a definition of priority areas and programs, international joint calls (NSF-EU-Japan-China) and funding mechanisms.



The I-SAMCO (International SAMCO) Kick-Off Meeting took place in Vienna / Austria in May 2004. As the specific support action I-SAMCO is embedded in SAMCO it was concurrently the **9th SAMCO Workshop**. Large networks and projects have been identified worldwide acting along the same lines as SAMCO to accommodate the international demand for standardization initiatives. I-SAMCO is scheduled to operate until November 2006.

WS10 – SAMCO Workshop in Germany



The 10th SAMCO Workshop took place on April 28th and 29th 2004 at BAM (Federal Institute for Materials Research and Testing) in Berlin / Germany and was well attended by 28 participants from all over Europe.

A range of members of the SAMCO Community, top experts in their fields, delivered insight into a wide spectrum of opinions on what should be the main subject areas for the research agenda in the future.

First Day of the Workshop

Mr Luis Ortega (GEOCISA, Spain), proposed that first of all the terms “monitoring” and “control” should be clearly defined, easy to understand for everyone.



Mrs Livia Pardi (Autostrade, Italy) reported on the European Construction Technology Platform (ECT). According to her speech the research agenda will be decided by a high level group by June 2006. New fields within ECT have just been launched and will be approached by the SAMCO Community. Many monitoring activities interfering with other branches are currently carried out; national platforms being active in different fields are formed up or do already exist, but a common approach

as lobby is still lacking.

The leader of the ECT platform is the Council for Science and Technology Policy (CSTP) in France. Mr Christos Tokamanis (European Commission) steers the platform from Brussels.

Claude Dumoulin (BOUYGUES, France) explained his opinion concerning the important points to be considered in monitoring and demanded by industry, which are:

- structural assessment
- geometry control
- dealing with uncertainties (mainly with tunnel boring machines)
- risk management
- waste traceability
- reduction of noise
- logistics of construction
- automation (robotics)
- transparent ground (analysis of ground condition surrounding a TBM)
- locating workers in tunnels
- substituting workers in tunnels
- to know what is going on



As a result noise and environmental questions are major issues for the contractors, furthermore vibration and safety.

Mr Brownjohn (University of Sheffield, UK) spoke about his experience in vibration limits in D-RAM productions. He expressed the opinion that additional static monitoring might be useful.

Mr Del Grosso (University of Genoa – DISEG, Italy) presented visions and breakthroughs as well as objectives of automated monitoring systems. An important issue is the improvement of reliability of the systems. Smart materials are demanded for their construction. According to Mr Del Grosso a rapprochement towards more general categories of structures has to be achieved, as well as the availability of additional information along with the response. Another concern is the integration of

automated monitoring into existing systems (not only roads and rails but also pipelines). The application to underground systems is of priority.

Another issue mentioned on the first day of the workshop was homeland security, for which the action plan 2010-2020-2030 was presented.

After the lectures and discussion, the participants of the workshop had the possibility to get to know the City of Berlin by taking part in a two hours sightseeing tour by bus.



Before the joint dinner the Federal Institute for Materials Research and Testing was visited.

FP7 Research Agenda

The second day of the workshop was aimed at producing a research agenda.

Mr Rohrmann (BAM, Germany) spoke about the elaboration of a range of ISO codes and relevant standards such as the German "Merkblatt 89". He also presented a very comprehensive statistic on the 48 projects handed in by the members, according to which monitoring application varies widely. The demand for structural health monitoring system software packages is among the greatest. The terms CMS (Continuous Monitoring System), PMS (Periodic Monitoring System) and EMS (Event Monitoring System) were clearly defined by Mr Rohrmann. A further issue mentioned is to elaborate concepts on data management.



Mr Holnicki-Szulc (IFTR, Poland) gave a presentation on work concentrated on damage detection and structural control carried out in the recent years and covering the following subjects:

- automatic damage detection
- load identification
- impact energy absorption
- retrofit

He presented examples of signal transmission of over 60m in pipelines where Piezzo Electric Sensor Actuators are used for damage detection. This method could be applied to water networks with possible leakages and could also be used in the field of security.

Mr. Geier (ARSENAL, Austria) gave a presentation based on the vision of ERTRAC (www.ertrac.org). He explained that in the Austrian guideline RVS 13.71 "Monitoring, Control and Assessment of Civil Engineering Structures, Road Bridges" the inspection interval could be increased from 6 to 10 years if monitoring methods were applied, which is a first step towards standardisation.

Mr Renda (JRC, Italy) spoke about the current situation of the Joint Research Centre whose main duty is to support the European Commission. The new targets of the JRC are safety, security and earthquake engineering as a main focus of institutional research.



Mr Goltermann (RAMBOLL, Denmark) stressed the importance of infrastructure management based on facts from monitoring to operate efficiently. According to his lecture one of the main targets of the next few years should be an improvement of efficiency in monitoring. Furthermore damage detection had to be enforced and probabilistic approaches were necessary to deal with uncertainties. Considering existing monitoring systems Mr

Goltermann referred to fixed big systems in few structures which should be replaced by more mobile systems, or ideally a handheld device would provide an inspector with the necessary data

In his lecture Mr Huth (EMPA, Switzerland) presented a model of a cable stayed bridge carrying a wireless network of sensors, which is currently tested by EMPA. Referring to Mr Huth one of the main targets to be reached in the near future should be the seismic resistance assessment. Other points he mentioned concerned smart materials for construction such as titan-nickel alloys and the use of recyclable materials.

Mr Caussignac (LCPC, France) presented his view on future monitoring and inspection of bridges. According to his speech aerial inspection of structures is currently tested in France, which requires unmanned aircraft or model helicopters. Considering monitoring and the application of existing technologies to it, promotion of training and planning in this field should assure proper use.

Mr Demarie (POLITO, Italy) spoke about a new Italian research project of national interest on monitoring and control of the historical heritage - relevant for SAMCO in many sectors - with a fixed duration of 2 years and a budget estimated at € 800.000,--. The target of the project is to develop low-cost distributed technologies for monitoring, furthermore:

- data mining and processing
- low cost sensors
- management of noisy data
- probability of distribution of parameters (base distribution) and
- wireless systems

Mr Wenzel used his final presentation to explain the current practice in ambient vibration monitoring and its planned integration into the research agenda.

WS11 - I-SAMCO NEES Workshop in Italy

The first International Workshop, the NEES and NEESgrid Seminar, was held in Ispra / Italy from May 23rd to May 24th 2005. The seminar taking place on the premises of JRC Ispra 2005 was organized by NEESit (international Partner NSF) and JRC (project participant).

This international workshop held in the course of the I-SAMCO project had the following objectives:

- Identification of the current practice and state of the art
- Meeting of the International forum
- Integration of SAMCO partners
- Coordination and harmonization of ongoing RTD activities



In the United States there are strong initiatives in the subject of earthquake engineering. The largest investment (500 million US\$) is NEES (Network for Earthquake Engineering Simulation), an effort of the NSF (US National Science Foundation) on earthquake engineering simulation. This project has brought advances in engineering and visualization tools for complex and comprehensive simulations of soils and full-scale infrastructure systems. Robust methodologies for earthquake hazard

mitigation, enabling development of enhanced policy have been developed. A number of unique testing facilities have been constructed and taken into service in October 2004. The NEES Consortium has the order by the fund raiser NSF to enhance and look for international collaboration.

The NEES seminar, follow-up of the International Harmonization Workshop held at JRC-Ispra on September 27th to 28th 2004, was attended by 31 participants from EU, Taiwan and USA, representing national research centres and laboratories in the field of structural mechanics and earthquake engineering.

The seminar on NEES and NEESgrid was organized by NEESit and JRC and was conducted by Dr. Lelli van den Einde, Assistant Director for NEESit and Dr. Shannon Whitmore (Software Architect). The objective of this seminar was to present the NEESgrid initiative to the European earthquake community and to discuss potential collaborations.

The first day of the seminar was dedicated to the introduction of NEES and the description of the software components. A description of the NEES cyber infrastructure and a tutorial on the NEESit software was given.

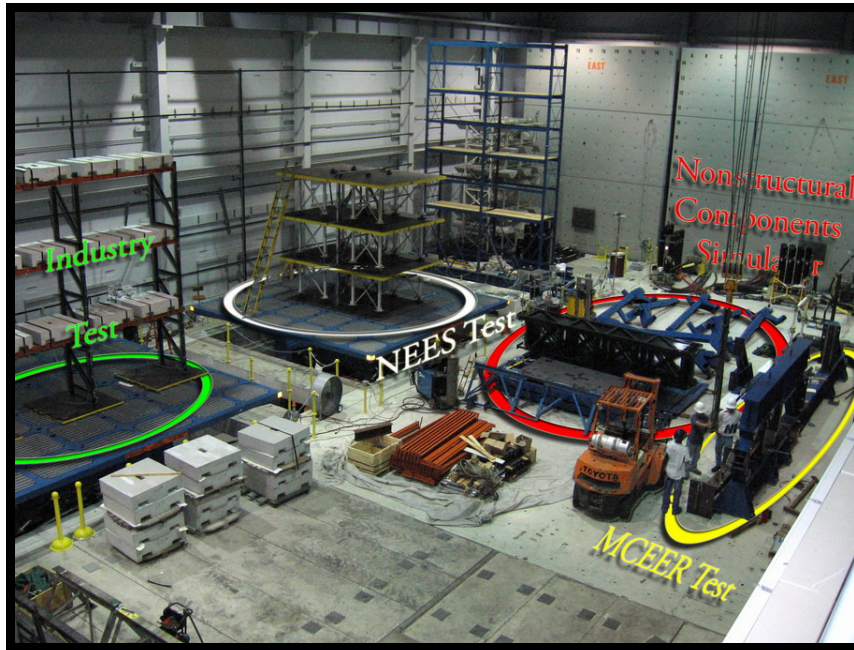
The second day was devoted to a more in-depth presentation of the NEESit software, technical discussion on software and hardware and also discussion with the participants about possible collaboration with NEESit.

Technical Content of the Workshop

At first Mr Pegon gave an introduction to the problem in the European earthquake engineering community, and stressed that there was no political will and a reduction of financial support for large installations in Europe.

Mrs Van den Einde, Assistant Director of NEESit gave an introduction to NEES. The time schedule indicated that the data repository should be launched by the end of 2005 or the beginning of 2006. An interim repository was launched in March 2005. Afterwards Mrs Van den Einde gave an introduction to the NEES infrastructure.





Dual 6 DOF Tables - SUNY Buffalo Shake

She presented an overview of the laboratories integrated in NEES, which are:

- UC San Diego
- University of Nevada at Reno
- University of Buffalo
- University of Minnesota
- University of Colorado
- University of Illinois
- Lehigh University
- UC Berkeley
- Cornell University
- Oregon State University
- UC Davis
- Rensselaer Polytechnic University
- University of Texas
- UC Los Angeles
- UC Santa Barbara

Later on an introduction to NEESit was given. It was stressed that the major task of NEESit was to support the scientists at their test facilities by a suitable IT infrastructure. This infrastructure was launched in October 2004. An introduction on the priorities and services of NEESit was given. Currently there was an interim data repository, a user support centre, a FTP server, a web server, an e-mail list management, etc.

The software architecture of NEESit software was described and demonstrated. On principle there are three domains of software:

- In **San Diego** there is the central data repository and the NEEScentral.

- At the **equipment sites** there is the software NEESpop that is the interface between NEEScentral and other software applications, flexTPS, which is the tool for telepresence, and NEESdaq for data acquisition on the test sites.
- **Remote clients** can connect via internet to the NEESpop for tele presence and data visualization. Remote control to the facilities in the equipment sites can be provided, so that a test can be run remotely from outside the laboratory. The tools implemented on this stage are the RDV, the real-time-data-viewer, that is used for visualization of data during tele presence session, the NTCP for Matlab, which is the NEES transfer protocol and finally the PNNL electronic notebook.

NEEScentral is a web based interface to the data repository with an authentication model. NEES members are able to upload and download data to the server. By an authorization model the data can be made public or accessible to a restricted user group. Currently it contains all NEES projects and also some non NEES projects. It could be seen that this platform is quite similar to the SAMCO database with regard to its conception.

The NEEScentral provides a web-interface to the interim metadata model. There is a certain folder / file hierarchy for the upload and storage of the data. This structure is very generic and high-level, because it is made to fit all the disciplines in earthquake engineering from experiments on shake tables to the tsunami wave basin. In future it should reflect the local storages of the labs, so that an easy migration of the data from the local sites to the central repository is possible. It is planned that in future the equipments sites will use this repository as backup for their data.

The mentioned high-level file hierarchy of the Meta data model consists of a project folder at top-level; the next level consists of experiments carried out in this project, then trails within the experiments and finally data acquired in the experiments. All of these levels can contain documents, analyses, and other general information. As already mentioned this is a very ruff structure that needs to be more detailed in future in order to be used as standard.

NEESpop is installed at the testing facilities sites and gives access to the tele presence tools, collaboration tools, local data tools and simulation tools by a web interface. Besides NEESpop flexTPS should be installed, providing a web interface for the tele presence software tools at the testing facilities and allowing remote control of the facilities in real time. NEESdaq for the data acquisition software Labview should also be installed.

A demonstration was given on flexTPS and RDV at which a connection to the San Diego lab was created and a small shaking table was started up and remotely controlled. With the RDV client the data could be viewed in real time. I was stressed that the software is not able to handle a huge number of channels.

In NEESpop there is another collaboration tool called CHEF. It was stressed that CHEF is not robust enough and will probably be taken out of NEESit architecture. CHEF is an internet portal that provides project workspaces (upload / download of data, e-mail distribution lists, chat rooms, e-mail archive and group calendars).

Conclusions from the Workshop

The final session of the workshop was devoted to international collaboration and led to the following conclusions and recommendations that were stated in a resolution approved by the major organizations. The conclusions are targeted at the exchange of data and on tele-presence:

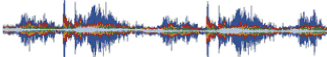
Data

- The preservation and the exchange of data together with their context (full background documentation) are put forward as a key issue by all the participants of the seminar.
- There is a need for a worldwide initiative devoted to standardization to allow for data exchange and mining between the different research institutions in different countries and continents. NEESinc will launch a specific action devoted to standardization.
- The European participants expressed their preference for a central database placed in Europe for the upload of EU data, rather than uploading to the US central database. Having experiments and database in the same time zone guarantees an immediate support from the data base staff. NEESit is open to provide assistance in either solution.
- In addition to the existing or already planned central repositories in US, Japan and Korea, this “European central” would improve the robustness of a global system of central repositories. For the user the system could work as one large virtual database potentially serving as off-site back-ups for each other such that if one central repository goes down another could take over.
- JRC-ELSA will explore the possibility to host such a central European repository.
- As a pilot step in the collaboration effort, JRC-ELSA will upload all the data of one of its project, stored on its local database into the NEEScentral database in order to assess the compatibility between the two repositories. This could also be a first step for defining a common data model. A report about this activity will be circulated among the seminar participants.

Tele-Presence

- There is a strong interest of the EU participants in the use of the NEES tele-presence tools (Ring Buffer, Real Time Data Viewer and flexible Tele-presence System). The demonstrations of these tools, given during the seminar, were convincing in spite of the low bandwidth of the Internet connection available.
- NEESit is willing to give support in the area of tele-presence and to receive feedback on its use.
- The JRC-ELSA is ready to use the tele-presence tools and to dedicate programming efforts in order to stream its data in a way suited for the Ring Buffer. Report on developments and achievements in this activity will be circulated among the seminar participants.

WS12 - Summer Academy 2005 in Austria

2005 

Summer Academy SAMCO



80 persons from 27 nations from all over the world participated in the SAMCO Summer Academy, which took place from September 5th to September 9th 2005 in the province of Salzburg in Austria, to be more precise, in Thumersbach, situated at the mountain lake Zeller See opposite the small town Zell am See. The venue was the Cultural Centre Lohninghof, a building first mentioned in the 9th century after Christ and perfectly restored in the year 2000.

Lectures were partly given in the big auditory, partly in a smaller seminar room with the possibility for the participants to choose the presentations more interesting for their work.

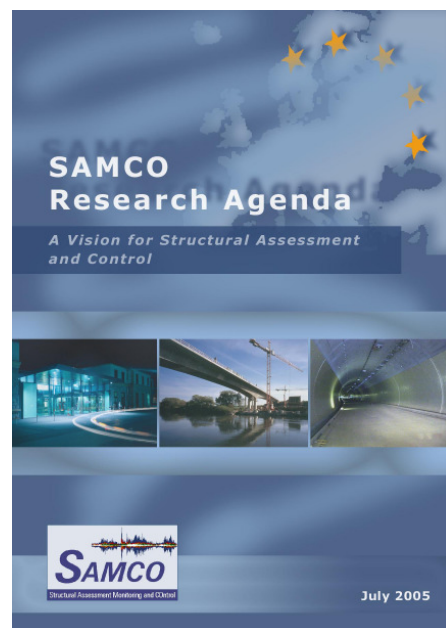
The aim of the Academy was at first to bring together top experts in structural assessment, monitoring and control from all over the world to build connections across the borders and even with experts from the new EU member states. The expectancy regarding this important meeting was very high, due to the fact that top experts were invited to report on their practical experience and to discuss current research activities.

Those expectations were exceeded by far. In a most fruitful environment participants had the possibility to get to know companies and research institutes better and to discuss the future development in their fields.

Late summer days with lots of sunshine inspired people to hold a lively meeting and to give interesting input and ideas for future projects.

In the course of the Academy the draft of the SAMCO Research Agenda was introduced to the participants by the SAMCO Coordinator Dr. Helmut Wenzel and the European Scientific Officer Dr. Georgios Katalagarianakis outlined the EU Commission's perspective on the 7th Framework Programme.

The first day of lectures gave insight into advanced bridge monitoring, seismic assessment and experimental work, for example the 3-D full-scale earthquake testing facility E-DEFENSE from Japan.



The second day started with lectures on monitoring projects in Japan and the USA and continued with forensic engineering and further speeches on projects carried out by the world's largest test and facility networks.



In the afternoon the Participants had the opportunity to get to know different measuring systems developed by VCE Holding GmbH. Those outdoor demonstrations met with great interest and went off very well thanks to the great weather.

The last day of lectures was dedicated to various topics such as decision support systems, acoustic monitoring, and European research projects as well as to an introduction of the Network for Earthquake Engineering Simulation.

Besides the lectures a range of social events made the Summer Academy an event to remember. On the arrival as well as on the departure day participants had the opportunity to join guided hiking tours in the close mountains or to make a trip to the old town of Salzburg, declared Cultural Heritage of the World by the UNESCO in 1997.



Once in the course of the Academy each guest could enjoy the Academy Dinner, a set meal with Austrian delicacies in the restaurant of Lohninghof.

Those activities also added to the good atmosphere which again abetted networking.

The contributions and photos of the SAMCO Summer Academy can be downloaded from the SAMCO Database: <http://samco.jrc.it/>

WS13 – SAMCO NAS – Workshop in Slovenia

31 persons mostly from Slovenia participated in the 13th SAMCO Workshop dedicated to the newly associated states (NAS) of the European Union and which took therefore place in Ljubljana / Slovenia from October 10th to October 11th 2005.

The venue was situated in the city of Ljubljana on the premises of the company ZAG (Zavod za gradbeništvo Slovenije), Slovenia's national building and civil engineering institute. It was founded by a decree, promulgated by the Government of the Republic of Slovenia on April 21st, 1994, by transferring a part of ZRMK Ljubljana (the former Institute for Testing and Research in Materials and Structures) into a governmental research and testing institute. ZAG Ljubljana was entered into Slovenia's official List of Companies on March 17th, 1995.

Lectures were given in the big auditory on the 5th floor of the building.



The aim of the Workshop was at first to bring together experts in structural assessment, monitoring and control from Slovenia and the bordering countries to build connections between the former and the new EU member states and to inform each other about the state-of-the-art in bridge monitoring.

The expectancy regarding this meeting was high as experts from Slovenia were invited to report on the practical experience in their country and to discuss current research activities with people from the former EU member

states.

In a very fruitful environment the participants had also the possibility to get to know the company ZAG with its research laboratory.

After the introduction of ZAG by the director of the Slovenian National Building and Civil Engineering Institute in the morning of the first day, the SAMCO-coordinator Mr Wenzel and Mr Marcellini of IDPA / Italy spoke about monitoring and control of civil engineering structures.



In the afternoon of the first day a practical demonstration of bridge monitoring was carried out on the cable stayed Lubljana Bridge, the so called “Harfa”, by the team of VCE / Austria.

The BRIMOS-Recorder and the BRIREC software, used for ambient vibration measurements and evaluation of bridges as well as the full BRIMOS equipment with sensors linked with the data logger to measure the vibration behaviour of the structure and the BRIMOS software for evaluation and presentation of results as well as the GREEN-Eye – software for conversion of measured data was shown to the participants.

The results of those measurements (graphs, tables and calculations) were presented and discussed by VCE on the second day of the workshop. As to Mr Wenzel’s speech it is unavoidable to improve some construction details of the small cable stayed bridge in order to guarantee the safety of the bridge (see chapter 3).



The lectures of the second day gave insight into the activities of ZAG Ljubljana in the area of structural monitoring and control, such as geotechnical, corrosion or bridge and traffic monitoring or monitoring of buildings.

In the course of a visit to the laboratories of ZAG, guided by Mr Znidaric and Mr Bosiljkov the participants got to know different practical research applications and testing methods for structures used by

the civil engineering institute.



Other topics touched on at the workshop were activities at the University Maribor, the SiWIM bridge weigh-in-motion system, the compensation of environmental influences, decision support systems and future developments of monitoring and control.

Demonstration at the Ljubljana Bridge



During the NAS workshop a demonstration has been performed at the bridge to show the potential of current practice monitoring systems. This is an executive summary of the results obtained for information to the bridge owner and operator.

The bridge has an unusual design characteristic. This is represented in the results obtained from the measurements. The following has been observed:

- The calculated eigenmodes of the structure show an uplift of the bridge at the abutments during normal operation. This should not happen in a normal case and is already potentially dangerous during a moderate earthquake. Retrofitting is therefore recommended.
- The bridge shows vibrations in all 3 directions at the same vibration level. This is rather unusual because vertical vibrations are usually dominant. The result is a visible vibration in horizontal direction that can be observed by a movement of about 3mm in the expansion joints with a frequency of about 2-4 Hz. This is potentially damaging to the expansion joints and might lead to structural problems.
- The vibration intensity recorded during this short period is rather high. Overstressing of the bridge structure at extraordinary loading situations might be expected.
- The detailing at the cables does not represent the minimum international standard and should be improved. Particular the water problem should be treated in order to avoid cracking by freezing water in winter.
- The system damping values are unreasonably high and indicate that the bridge will have a short lifetime.

The following is recommended:

- Immediate action should be taken to treat the problem of uplifting at the abutments. A retrofit is recommended.
- A change of detailing of the cables water protection is recommended. Particular before the winter period a higher protection level should be reached to avoid damage.
- A detailed measurement campaign is recommended in order to record all necessary phenomena to understand the bridge behaviour and the seriousness of the problem. It is estimated that a 2day campaign is sufficient to do so. Further investigation work will also help to deepen the knowledge and justify the necessary measures.

It is further recommended to include a cable stayed bridge expert into the investigation team to profit from existing experience.

The **14th Workshop**, another SAMCO-NAS Workshop will possibly be held in spring in Hungary.

The **Final** and **15th SAMCO Workshop** will be held at the end of March 2006 just before the project final. Amongst other items the history and achievements of the SAMCO project, the future of SAMCO as well as project ideas for FP 7 will be outlined. Further the European Association for SAMCO will be founded in the course of the workshop.

ANNEX

Detailed Workshop Programmes

Final Programme of 1st SAMCO Workshop

<p>*Chairman: Helmut Wenzel Vienna Consulting Engineers E_mail contact: vce@atnet.at</p> <p>● Co Chairman: Livia Pardi Autostrade s.p.a. E_mail contact: lpardi@autostrade.it</p>
<p>* Helmut Wenzel</p> <p>Introductory considerations to the European Network SAMCO on Structural Assessment, Monitoring and Control E_mail contact: vce@atnet.at</p>
<p>● Livia Pardi</p> <p>End users requirements on Monitoring and Assessment of bridges E_mail contact: lpardi@autostrade.it</p>
<p>● Bettina Geier</p> <p>The SAMCO database, an information source for everybody E_mail contact: geier@fcp.at</p>
<p>● Rainer Flesh</p> <p>Needs and means for structural monitoring - first report on a literature review E_mail contact:</p>
<p>● Anna Kingsmill Vellacott</p> <p>The SAMCO Summer Academy, training for professionals E_mail contact: vellacotta@bre.co.uk</p>
<p>● Katrin Schmid</p> <p>Monitoring and Assessment of existing buildings and its relevance for Earthquake Engineering E_mail contact: katrin.schmidt@bau.uni-rostock.de</p>

Final Programme of 2nd SAMCO Workshop

Monday, September 30 - MORNING

8:30 Opening of the Registration Desk

LECTURES 1

INTRODUCTION BY THE NETWORK COORDINATOR

10:00

The SAMCO Network

Helmut Wenzel
Vienna Consulting Engineers

10:20

Basic Idea of Integrated Projects in 6FP

Helmut Wenzel
Vienna Consulting Engineers

10:40

Road Map to Success

Helmut Wenzel
Vienna Consulting Engineers

DATABASE AND DATA EXCHANGE

11:00

Web Based Tools for Information and Data Exchange

Bettina Geier
Vienna Consulting Engineers

11:15

SAMCO Database: Content and Handling

Kent Mehr
Joint Research Centre

HEALTH MONITORING

11:30

International Collaboration on Structural Health Monitoring

Bart Peeters
LMS International NV

11:50

Vibration Monitoring of Civil Engineering Structures: Faith or Mistrust?

Guido De Roeck
Katholieke Universiteit Leuven

12:10

IMAC- Integrated Monitoring and Assessment of Cables

Helmut Wenzel
Vienna Consulting Engineers

12:30 Lunch Break

Monday, September 30 - AFTERNOON

END USER FORUM 1 - Health Monitoring

PRESENTATIONS ON HEALTH MONITORING

13:30

BRIME – Bridge Management in Europe: The Role of Monitoring

Richard Woodward
TRL Limited

13:45

CONVIB - Innovative Control Technologies for Vibration

Sensitive Civil Engineering Structures

Georges Magonette and Lucia Faravelli
Joint Research Centre

14:00

European Codes and Standards for Monitoring and Assessment

Rolf Rohrmann
Federal Institute for Materials Research and Testing

14:15

**Improved Tools For Structural Monitoring - New Test
Techniques with Reaction Mass Exciter VICTORIA and A
Software for Sensitivity Studies**

Rainer Flesch
Arsenal Research

14:30

The Need for Monitoring: End User Requirements

Livia Pardi
Autostrade

Coffee Break

DISCUSSION FORUM

15:30 **Forming of the Consortium** / Panel

16:10 **Definition of Objectives** / Panel

16:50 **Proposal Preparation** / Panel

Closing Day 1

Tuesday, October 1 - MORNING

8:30 Opening of the Registration Desk

LECTURES 2

INFORMATION FROM THE EUROPEAN COMMISSION - DG RESEARCH

9:00

General Information about the 6th FP

Hans Hartmann Pedersen
European Commission DG RTD Growth G2

9:30

Integrated Projects (IP)

Hans Hartmann Pedersen
European Commission DG RTD Growth G2

10:00

Networks of Excellence (NoE)

Hans Hartmann Pedersen
European Commission DG RTD Growth G2

10:30

Special Advice on the Particular SAMCO Initiatives

Hans Hartmann Pedersen
European Commission DG RTD Growth G2

Coffee Break

END USER FORUM 2 - Seismic Assessment

PRESENTATIONS ON SEISMIC ASSESSMENT

11:30

Recent Advances and Future Perspectives on Site Characterisation, Site Effects, Bridge Engineering and Vulnerability Assessment of Lifelines

Kyriazis Pitilakis
Aristotele University Thessaloniki

11:45

Needs for Future R&D on Control Techniques of Seismic Vibrations

Alessandro Martelli
ENEA

12:00

Information on Recent Initiatives (EoI's) in Earthquake Engineering - Assessment of Seismic Risk of Important Civil Structures -

Rainer Flesch
Arsenal Research

12:15

SPIDER - Strands Pre-stressing for Internal Damping of Earthquake Response

David Gratteau
Bouygues Travaux Publics

12:30

**ACE Project - Active Control in Civil Engineering: From
Conception to Full Scale Application**

Claude Dumoulin
Bouygues Travaux Publics

12:45

Structural Control in Civil Engineering

Fabio Casciati
University of Pavia

13:00 **Lunch Break**

Tuesday, October 1 - AFTERNOON

14:00

Seismic Vulnerability Studies

Alberto Peano
Enel.Hydro/Ismes

14:15

On-Going Vibration Isolation Research at Ismes

Alberto Peano
Enel.Hydro/Ismes

DISCUSSION FORUM

14:30 **Forming of the Consortium** / Panel

14:30 **Definition of Objectives** / Panel

15:00 **Proposal Preparation** / Panel

Coffee Break

REPORTS

16:00 **Progress during the Workshop**

16:30 **Status of the Integrated Project Proposals**

17:00 **Definition of the next Steps**

17:30 **Final Discussion**

Closing of the Workshop

Final Programme of 3rd SAMCO Workshop

DAY 1

<i>Monday, April 28 - at the BOKU (Exner Haus, Room EH 02)</i>		
TIME	PRESENTATION AND SPEAKER	PARTICIPATION
PRELIMINARY DISCUSSION		
9:00	<i>For the Core Partners Only:</i> Preliminary Discussion	Core Participants only!
OFFICIAL START OF THE WORKSHOP		
11:00	Introduction by the Coordinator Helmut Wenzel, Vienna Consulting Engineers	all participants
12:00	Lunch Break	
PRESENTATIONS OF THE SUB-PROJECTS - Part 1		
13:00	H1 - Damage Detection, System Identification Guido De Roeck, Katholieke Universiteit Leuven	all participants
13:45	H2 - Sensor Development Bart Peeters, LMS International NV	all participants
14:30	Short Break	
15:00	H3 - Expert System Tadeusz Uhl, Energocontrol sp	all participants
15:45	H4 - Standardization, European Data Reader & Format Werner Rücker, Inst. for Materials Research & Testing	all participants
16:30	Short Break	
17:00	H5 - Risk Assessment, Life Cycle Engineering Chris Broadbent, Building Research Establishment Ltd	all participants
17:45	H6 - Laboratory Tests & Demonstration Vito Renda, Joint Research Centre, ELSA	all participants
19:00	Dinner at a typical "Heurigen"	

DAY 2

<i>Tuesday, April 29 - at the BOKU (Exner Haus, Room EH 02)</i>		
TIME	PRESENTATION AND SPEAKER	PARTICIPATION
PRESENTATIONS OF THE SUB-PROJECTS - Part 2		
9:00	V1 - Bridge Assessment, Database, Environm. Cond. Helmut Wenzel, Vienna Consulting Engineers (VCE)	all participants
9:45	V2 - Re-evaluation of Buildings, Natural Hazards Rainer Flesch Arsenal Research	all participants
10:30	Short Break	
11:00	V3 - Transport. Industry, Embedded Sensors, LICYMOS Michel Bugaud, CEA Saclay	all participants
11:45	V4- Integrated Monitoring of Wind Energy Plants Malcolm McGugan, Research Centre RISOE	all participants
12:30	Lunch Break	
14:00	V5 - Smart Structures, TESS Fabio Casciati, University of Pavia	all participants
14:45	V6 - Assessment of High-rise Buildings, Wind Facades Helmut Wenzel, Vienna Consulting Engineers (VCE)	all participants
15:30	Short Break	
16:00	W1 - Nuclear and Plant Engineering Klaus Kerkhof MPA, University Stuttgart	all participants
16:45	W2- Aeronautics and Mechanics Kimon Alexiou PROTOS	all participants
17:30	Short Break	
18:00	Discussion	all participants

OPTIONAL DAY 3

<i>Wednesday, April 30 - at VCE, Diesterweggasse 1, A-1014 Vienna</i>		
TIME		PARTICIPATION
INDIVIDUAL TALKS		
Time: by appointment	Individual Meetings with Dr. Wenzel	On arrangement only!

Final Programme of 1st SAMCO Summer Academy

DAY 1 – Monday, July 14, 2003

	<p>In the morning: Arrival at the Cambridge University</p>
Time	Programme
14:00	Registration
16:00	<p>KEY NOTE LECTURE 1</p> <p>SAMCO Road Show Helmut Wenzel / VCE</p> <ul style="list-style-type: none"> ▶ How can monitoring help you ▶ Progress in assessment ▶ Rating of structures ▶ Examples of application ▶ The new hardware generation ▶ The expected software development ▶ International aspects ▶ Ongoing research worldwide
17:00	Welcome Drinks
19:00	Dinner

DAY 2 – Tuesday, July 15, 2003

Time	Programme	
	KEY NOTE LECTURE 2	
9:00	Monitoring and Assessment Helmut Wenzel / VCE <ul style="list-style-type: none"> ▶ What can be monitored ▶ Which approach to take ▶ Current Practice ▶ Assessment tools ▶ Practical aspects 	
10:30	Coffee Break	
	HEALTH MONITORING	ASSESSMENT OF STRUCTURES
11:00	Health Monitoring on Bridges VCE <ul style="list-style-type: none"> ▶ Monitoring of fleets of structures ▶ Condition rating ▶ Damage detection and assessment 	Managing Large Bridge Structures in Scandinavia Per Goltermann / RAMBOLL <ul style="list-style-type: none"> ▶ Oresund Link ▶ Storebelt bridge
11:45	Damage Detection in Post-tensioned Bridges VCE <ul style="list-style-type: none"> ▶ Assessment of external cables ▶ How to find the damage ▶ How to assess the bridge 	Structural Testing Alberto Peano / ISMES <ul style="list-style-type: none"> ▶ Shaking Table Tests ▶ Dynamic System Identification ▶ Seismic Loading
12:30	Lunch	
	PRACTICE	DAMAGE DETECTION
14:00	Practical Bridge Management Livia Pardi / AUTOSTRADADE <ul style="list-style-type: none"> ▶ Managing 3000 kilometres of highway ▶ End users point of view 	Damage Detection in Cables Andrea Bergamini & Rouven Christen / EMPA <ul style="list-style-type: none"> ▶ Magnetic Flux Leakage Method ▶ Theoretical background ▶ Methodology
15:00	Discussion	Discussion
15:30	Coffee Break	
16:00	Structural Health Monitoring in the USA Emin Aktan / Drexel University, USA <ul style="list-style-type: none"> ▶ Research initiatives ▶ Trends ▶ Examples of applications 	
17:00	Discussion	
17:30	Closing Day 2	
19:00	Dinner	
21:00	Optional Talk to Lectures	

DEMONSTRATION (Out door)

DAY 3 – Wednesday, July 16, 2003

Time	Programme	
9:00	<p align="center">KEY NOTE LECTURE 3</p> <p align="center">6th Framework Programme Hans Hartmann Pedersen / European Commission</p> <ul style="list-style-type: none"> ▶ General introduction to 6FP ▶ The instruments IPs and NoEs ▶ Results of the first call ▶ Lessons learned for the future calls 	
10:30	Coffee Break	
	INTEGRATED PROJECTS	LARGE TESTING FACILITIES IN EU
11:00	<p align="center">Industry's Point of View Claude Dumoulin / BYTP</p> <ul style="list-style-type: none"> ▶ Changes from 5FP to 6FP ▶ Consequences of the new rules ▶ Trends in industry participation 	<p align="center">ELSA - Laboratory of the European Commission's Joint Research Centre Vito Renda / IPSC, JRC</p> <ul style="list-style-type: none"> ▶ Research projects supporting EU policies ▶ Basic research for codes & standards
11.45	<p align="center">NEES</p> <p align="center">Steven McCabe / NSF-Washington, USA</p> <ul style="list-style-type: none"> ▶ The NEES Programme and facilities ▶ How you can participate 	<p align="center">BRE – Europe's Largest Test Facility</p> <p align="center">David Moore / BRE</p> <ul style="list-style-type: none"> ▶ BRE-Cardington Test Facility ▶ Test Examples and Results
12:30	Lunch	
	SUCCESS PROJECTS	TESTING
14:00	<p align="center">System Identification to Monitor Civil Engineering Structures (SIMCES) Guido De Roek / KUL</p> <ul style="list-style-type: none"> ▶ The idea of SIMCES ▶ Tests, results, impact on practice 	<p align="center">Materials Research & Testing Werner Rücker / BAM</p> <ul style="list-style-type: none"> ▶ Fatigue tests on bridges ▶ Long term monitoring of real structures
15:00	Discussion	Discussion
15:30	Coffee Break	
16:00	<p align="center">Integrated Monitoring and Assessment of Cables (IMAC) Roman Geier / VCE</p> <ul style="list-style-type: none"> ▶ Cable stayed bridges ▶ Assessment approach ▶ Monitoring examples 	<p align="center">Non-linear Behaviour of Damaged Structures Guido De Roek / KUL</p> <ul style="list-style-type: none"> ▶ Indicators in time domain ▶ Indicators in frequency domain ▶ Environmental influences
17:00	Discussion	Discussion
17:30	Closing Day 3	
19:00	Dinner	
21:00	Social Event: Punting	

Repetition of DEMONSTRATION of Day 2 (Out door)

DAY 4 – Thursday, July 17, 2003

Time	Programme	
9:00	KEY NOTE LECTURE 4	
	Operational Modal Analysis: A Tool for Structural Health Monitoring Bart Peeters / LMS <ul style="list-style-type: none"> ▶ Modal analysis ▶ Stochastic subspace identification ▶ OMA in civil engineering 	
10:30	Coffee Break	
	MONITORING SYSTEMS	RISK AND WHOLE LIFE COSTING
11:00	Structural Health Monitoring in Japan Yozo Fujino / University of Tokyo <ul style="list-style-type: none"> ▶ Research initiatives ▶ Trends ▶ Examples of applications 	Whole Life Cost Models for Practical Application Kathryn Bourke / BRE
11:45		Monitoring of Wind Farms Malcolm McGugan / RISOE <ul style="list-style-type: none"> ▶ Remote monitoring concepts ▶ Monitoring of turbine blades ▶ Assessment of turbine towers
12:30	Lunch	
	PRACTICAL RISK ASSESSM.	CONTROL
14:00	Classification of Bridges Development of a Compact Monitoring System Roman Geier / VCE <ul style="list-style-type: none"> ▶ Criteria for classification ▶ Levels of classification ▶ A simple and robust method 	Application of Control Mechanisms in Engineering Structures Andre Preumont / ULB <ul style="list-style-type: none"> ▶ Active damping via IFF ▶ Active isolation via "sky-hook" damper ▶ Semi-active control strategies
15:00	Discussion	Discussion
15:30	Coffee Break	
16:00	Decision Support and Expert Systems Helmut Wenzel / VCE <ul style="list-style-type: none"> ▶ Data handling, format & storage ▶ Automatic evaluation ▶ Decision making 	State of the art - Active and Semi-active Seismic Control Fabio Casciati / UNIPV <ul style="list-style-type: none"> ▶ Structural control features ▶ Passive structural control concepts ▶ Semi-active and hybrid structural control
17:00	Discussion	Discussion
17:30	Closing Day 4	
19:00	Academy Dinner	

Repetition of DEMONSTRATION of Day 2 (Out door)

DAY 5 – Friday, July 18, 2003

Time	Programme	
9:00	KEY NOTE LECTURE 4	
	<p>E-MOI - European Built Environment Assessment and Structural Health Monitoring Initiative Helmut Wenzel / VCE</p> <ul style="list-style-type: none"> ▶ The future of health monitoring and assessment ▶ The European strategy ▶ Visions for 2010 ▶ Possibilities to participate or benefit 	
10:30	Coffee Break	
	TRENDS	NATURAL HAZARDS
11:00	<p>Sensors and Systems in a Structural Health Monitoring Context Bart Peeters / LMS</p> <ul style="list-style-type: none"> ▶ International Practice ▶ Sensor and System Development 	<p>LESS-LOSS Alberto Peano / ENEL-HYDRO</p> <ul style="list-style-type: none"> ▶ IP on seismic hazard and landslides ▶ GIS technology ▶ Alert Systems
11.45	<p>Future Trends and Developments in Structural Health Monitoring Helmut Wenzel / VCE</p> <ul style="list-style-type: none"> ▶ Decision support system ▶ Small independent wireless sensors ▶ Very smart solutions 	<p>Building Assessment Rainer Flesch / ARSENAL RESEARCH</p> <ul style="list-style-type: none"> ▶ Dynamic Monitoring ▶ Projects and Tools
12:30	Lunch	
	Official Ending	

Final Programme of 5th SAMCO Workshop

Monday, 26.01.2004

Subject	Speaker
<i>SAMCO Progress</i>	
- SAMCO Progress Current Initiatives: - NSF-NEES Project, USA - E-DEFENSE , Mega-Shaking Table, Japan - NSF-FHWA , Project on Bridges, USA	Helmut Wenzel (VCE)
Lunch	
Wind Energy Offshore - Monitoring Overview	Niels Erdmann (Prokon Nord)
Källösund Bridge - A case study of instrumentation and monitoring of an existing bridge on the Swedish west coast	Ebbe Rosell (Vägverket)
New Sensors System for the Monitoring of Traffic Load	Przemyslaw Kolakowski (IFTR)
Coffe Break	
Inspection of Railway Bridges - Austrian Federal Railways	Walter Potucek (ÖBB)
The Need for Monitoring and Control - Autostrade	Livia Pardi (Autostrade)
Geo-information	Bettina Geier (VCE)
Discussion	
Optional: Visit of the Leopold Museum, Museumsquarier Vienna and Dinner	

Tuesday, 27.01.2004

Subject	Speaker
<i>6FP - 6th Framework Programme</i>	
Basic Information on the 2nd Call of NMP FP6: - Statistics of the 1st call and Intention of the Commission - Plan for the 2nd Call - Proposal Idea BRIMOS - Proposal Idea SALMAPS - Proposal Idea EMASS	Helmut Wenzel (VCE)
Coffe Break	
<i>Proposals for Projects</i>	
3.4.4.1 - Human Friendly, Safe and Efficient Construction, Proposal: BRIMOS	
New Trends in Dynamic Testing of Bridges. The Perspective of FEUP.	Alvaro Cunha
Health Monitoring of Overhead Power Transmission Line	Dimitri Snegovski (ULG)
State of the art of Structural Health Monitoring	Hermann van der Auweraer (LMS)
Lunch	
3.4.3.2. Systems Research and Hazard Control, Proposal: SALMAPS	
Safety Assessment and Lifetime Management of Piping Systems	Klaus Kerkhof (MPA Stuttgart)
Health Monitoring of Non Accessible Pipes	Herbert Friedmann (WBI)
Piezo Fiber Sensors and Actuators for Structural Health Monitoring	Raino Petricevic (NMW)
Ultrasonic Lamb Waves for Structural Health Monitoring	Frank Schubert (IZP)
Coffe Break	
3.4.3.3 Optimizing the Life-Cycle of Industrial Systems, Products and Services, Proposal: EMASS	
Transfer Functions and Structural Health Monitoring	Konstantin Savov (VCE)
Evaluation of Civil Structures for Natural Hazards	Rainer Flesch (arsenal)
High-rise Buildings	Guido Hausmann (TUD)

Soil Dynamics and Geotechnical Earthquake Engineering	Anastasios Sextos (AUTH)
Latest and Current Activities in the Structural Health Monitoring and Structural Control	Olaf Huth (EMPA)
Knowledge Based Systems	Josef Küng (UNI LINZ)
Optional: Visit of the Leopold Museum, Museumsquarter Vienna and Dinner	

Final Programme of 6th SAMCO Workshop

AGENDA

IMAC Workshop (IMAC G1RD-CT-2000-00460)

April 22nd – April 23rd 2003

Place : CNTK – Railway Scientific and Technical Centre
Warsaw, Poland

Thursday, 22.04.2003 - First Day

08:30 – 09.00	Welcome Reception	
09.00 – 10.30	Monitoring and Assessment	VCE
10.30 – 11.00	Coffee Break	
11:00 – 12:30	IMAC – Presentation	VCE
12:30 – 13:30	Lunch Break	
13:30 – 14:30	Technical Details about the Bridge in Warsaw–“Estakada Bielańska“	CNTK
14.30 – 15.00	Coffee Break	
15.00 – 16.00	Estakada Bielańska – Research Methods and Tests + Results of the Bridge Tests in Warsaw	CNTK + VCE
16:30 – 17.30	Discussion	

Friday, 23.04.2003 - Second Day

08:30 – 09.00	Welcome Reception	
09.00 – 10.00 IBDM	CNTK and IBDM Presentations	CNTK +
10.00 – 10.30	Coffee Break	
10:30 – 12:00	Bridge Inspection Tools	ADVITAM
12:00 – 14:00	Lunch Break	
14.00 – 15.00	Future Projects	

Final Programme of 7th SAMCO Workshop

AGENDA

June 7- 8 2004

Place : Autostrade, Centro di Formazione Autostrade, via G.Donati 174, Roma

Monday, 07.06.2004

8:30 – 10:30	Steering Committee Meeting
until 11:00	Arrival of the other participants and welcome address
11:00- 12:30	SAMCO Status Report <i>Helmut Wenzel, VCE</i>
12:30-14:00	Lunch
14:00-15:30	Bridge Management in Practice - Part I Introduction of the session <i>Per Goltermann, Ramboll</i> End-users requirements and examples of monitoring <i>Richard Woodward, TRL</i> Durability monitoring on Reinforced Concrete Bridges <i>Per Goltermann, Ramboll</i> Simple monitoring of common structures in a BMS <i>David Gilabert, Geocisa</i>
15:30 – 16:00	Break
16:00-17:30	Bridge Management in Practice – Part II Integration of monitoring with reliability-based assessment for concrete bridges <i>Marios Chryssanthopoulos, University of Surrey</i> Integration of monitoring: the contractor point of view <i>Luis M^a Ortega, Geosica</i> Bridge Management Database <i>Kent Mehr, JRC</i>
19:30	Social Event

Tuesday, 08.06.2004

9:00-10:30	Guidelines for Structural Control <i>Olaf Huth, EMPA</i> Certification Procedure for Vibration Monitoring" <i>Roman Geier, Nathalie Hillgarter, ARSENAL Research</i>
10:30-11:00	Break
11:00-12:30	Standardization <i>Rolf Rohrmann, BAM</i> Results of the 2nd Call <i>Georgios Katalagarianakis, EC</i>
12:30-14:00	Lunch
14:00 – 15:30	Member Presentations Improved vibration based damage detection by enhanced strain measurements <i>Guido DeRoock, KUL</i> Development and analytical modelling of new antivibration track systems" <i>Giorgio Serino, UNINA</i> Modal filters for vibration based damage detection <i>Arnaud Deraemaeker, ULB</i> Features of the end users needs for monitoring bridges <i>Guyla Mentes</i>
15:30-16:00	Break
16:00-17:00	I-SAMCO introduction and integration <i>Helmut Wenzel, VCE</i> discussion

Final Programme of 8th SAMCO Workshop



Monday, September 27

09:00	OPENING SESSION	
	Announced by Vito Renda	
09:00	Welcome to JRC	JRC Representative
09:10	SAMCO and I-SAMCO: Introduction to the Workshop	Helmut Wenzel (VCE)
09:30	SESSION 1: INTERNATIONAL COLLABORATION	
	Chairman: H. Wenzel, Co-Chair: V. Renda	
09:30	JRC-ELSA and the International Collaboration	Michel Geradin (JRC)
10:00	The US NSF-NEES experience of collaboration	Joy Pauschke (NSF)
10:30	Coffee Break	
11:00	The NCREE and its collaboration	Ken-Chyuan Tsai (NCREE)
11:30	The FP6 and role of DG-RTD in I-SAMCO	Georgios Katalagarianakis (DG-RTD)
12:00	DISCUSSION: The International Collaborations: Why, how and in what area	
	Moderator: G. Katalagarianakis	
13:00	Lunch	
14:30	SESSION 2: LABORATORIES - PRESENT AND FUTURE	
	Chairman: Joy Pauschke, M. Geradin	
14:30	The CEA and its laboratories	Jean Claude Queval (CEA)
15:00	The ELSA laboratory	Georges Magonette (JRC)
15:30	BLADE: Bristol Laboratories for Advanced Dynamics Engineering	Colin Taylor (UK)
16:00	Coffee Break	
16:30	SESSION 3: DATA FORMAT, COMMUNICATION AND DISTRIBUTED TESTING (I)	
	Chairman: K. Tsai, Y. Van Den Einde	
16:30	Data Handling in the NEES Consortium	Anke Kamrath (SDSC)
17:00	Challenges of Using Vibration Monitoring Data for Real-Time Structural Health Monitoring and Decision Support	David Lau (U Ottawa)
17:30	IAEA Benchmark Project: Experience & Practice	Vito Renda (JRC)
18:00	CLOSING	
20:00	DINNER (hosted at JRC)	

Tuesday, September 28

09:00 SESSION 3: DATA FORMAT, COMMUNICATION AND DISTRIBUTED TESTING (II)		
Chairman: M. Kostov, A. Kamrath		
09:00	Green Eye Data Format	Robert Prethaler (APLICA)
09:30	Database & Communication Management	Josef Küng (FAW)
10:00	Approach to Standardization	Werner Rücker (BAM)
10:30	JRC technology for distributed laboratory	Pierre Pegon
11:00	Coffee Break	
11:30 PANEL DISCUSSION: DATA FORMAT, COMMUNICATION AND DISTRIBUTED TESTING		
Moderator: K.C. Tsai		
11:30	Data Acquisition and Processing in the Course of Surveillance of Vibration and Sound Immissions for the New Lower Inn Valley Railway	C.A. Schenk (TIWAG)
12:30	Lunch	
14:00	Visit of the ELSA laboratory	
15:00 PANEL DISCUSSION: INTERNATIONAL COLLABORATION		
Moderator: J. Pauschke		
15:00	Introduction to discussion	Helmut Wenzel (VCE)
	Benchmark Tests, Exchange of Information, Exchange of Researchers, Standardization, Schedule 2004-2006	
15:30	Discussion of a Joint Approach	
16:00	Coffee Break	
16:30 DRAFT RESOLUTION: On International Collaboration		
Chairman: H. Wenzel, V. Renda		
16:30	Recommendations for Research Objectives	
	Draft Implementation Plan	
	Forming of an International Steering Committee	
	Draft Resolution on International Collaboration	
	Announcement of next steps	
17:30	CLOSING of the Workshop	
17:40	Transfer to the Airport or Hotel by JRC	

Final Programme of 9th SAMCO Workshop

AGENDA

Kick Off Meeting : July 12th 2004

Place : VCE, Vienna, Diesterweggasse 1 (Big Meeting Room, Ground Floor)

9.30 – 10.00	Arrival, Registration and Welcome
10.00 – 10.30	Welcome Address by the Coordinator Welcome Address by DG Research
10.30 – 11.00	Motivation and History of I-SAMCO
11.00 -- 11.30	Coffee Break
11.30 – 13.00	Partner Presentations: all Partners (max. 10 min per Partner or 15 slides)
13.00 – 14.00	Lunch Break
14.00 – 14.30	Administration and Reporting to DG Research
14.30 – 15.30	Management Requirements <ul style="list-style-type: none">➤ Steering Committee➤ Selection of International Members➤ Task Leaders and Organisation➤ Harmonisation Workshop 27. – 28. 9. 2004➤ Next events
15.30 – 16.00	Coffee Break
16.00 – 16.15	Consortial Agreement
16.15 – 16.45	Next Steps <ul style="list-style-type: none">➤ Man Power, Relevant Persons➤ Project Calendar➤ Actions for the coming Period➤ Dissemination of Information
16.45 – 17.00	Miscellaneous Items

Final Programme of 10th SAMCO Workshop

Research Agenda 1010 – 2020 - 2030

Date: April 28th – 29th 2005

Hosting Organization: BAM Berlin, Federal Institute for Materials Research and Testing

Place: BAM Branch Office Fabeckstraße, Unter den Eichen 44-46, 12203 Berlin, House 89.

THURSDAY 2005-04-28		
10:30	Introduction: 7th European Framework Programme and Europ. Construction Technological Platform (ECTP): Perspectives, Requirements	L. Pardi ¹ (Autostrade), H. Wenzel ² (VCE)
11:30	Contractor's Needs for Monitoring During Construction	C. Dumoulin ³ (Bouygues)
12:00	Lunch	
13:30	Vibration Control and Assessment of Ultra-Sensitive Facilities	J. Brownjohn ⁴ (PLYMOUTH)
14:00	Monitoring Safety and Security Conditions Of Infrastructure	A. Del Grosso ⁵ (DISEG)
14:30	Coffee Break	
15:00	Safety Engineering	J. Holnicki-Szulc ⁶ (IFTR)
15:30	Structural Health Monitoring today – Results from Collected Case Stories	R. Rohrmann ⁷ (BAM)
16:00	Berlin Sightseeing Tour (Bus tour)	
18:30	Visit of BAM BAM Berlin, Federal Institute for Materials Research and Testing 12200 Berlin, Germany, Unter den Eichen 44-46	
19:30	Dinner at BAM	
FRIDAY, 2005-04-29		

¹ Dr. Livia Pardi, Autostrade/SMS, Leader of Focus Group 'Networks'

² Dr. Helmut Wenzel, VCE Holding GmbH, Coordinator of SAMCO Network

³ Msc. (Eng) Claude Dumoulin, Bouygues Travaux Publics

⁴ Dr. James Brownjohn, School of Engineering, University of Plymouth

⁵ Prof. Andrea Del Grosso, Dep. of Structural and Geotechnical Engineering, University of Genoa

⁶ Prof. Jan Holnicki-Szulc, Institute of Fundamental Technological Research, Polish Academy of Sciences

⁷ Msc. (Eng.) Rolf Rohrmann, Federal Institute for Materials Research and Testing

09:00	Vibration Based Monitoring - A Useful Approach?	R. Flesch ⁸ , R. Geier ⁹ (arsenal research)
09:30	Large Scale Tests at JRC-ELSA Relevant to Monitoring and Control of Structural Vibrations	Vito Renda ¹⁰ (JRC)
10:00	Break	
10:30	Infrastructure Management-Risk Based Inspection, Monitoring and Assessment	P. Goltermann ¹¹ (RAMBOLL)
11:30	Advanced Sensor Data Processing for Structural Health Monitoring	M. Basseville ¹² (CNRS/IRISA)
12:00	Lunch	
13:30	Actual Research Work of Structural Engineering Research Laboratory	O. Huth (EMPA) ¹³
14:00	Monitoring and control of civil infrastructures, trends, challenges and tentative research directions to meet future European needs	J.-M. Caussinage ¹⁴ (LCPC)
14:30	Break	
15:00	Monitoring ancient heritage: an Italian National Project (PRIN 2004)	A. De Stefano ¹⁵ (POLITO)
15:30	Conclusions for ECTP & The future of SAMCO	H. Wenzel ² (VCE)
16:00	Finish of the SAMCO Workshop	

Location:

BAM
Branch Fabeckstraße
Unter den Eichen 44-46
12203 Berlin
House 89

⁸ Prof. Rainer Flesch, Arsenal Research, Head of Business Unit Transport Routes Engineering

⁹ Dr. Roman Geier, Arsenal Research, Head of Business Unit Transport Routes Engineering

¹⁰ Dr. Vito Renda, Joint Research Centre-Ispira, Deputy Head of Unit, European Laboratory for Structural Assessment

¹¹ Dr. Per Goltermann, RAMBØLL

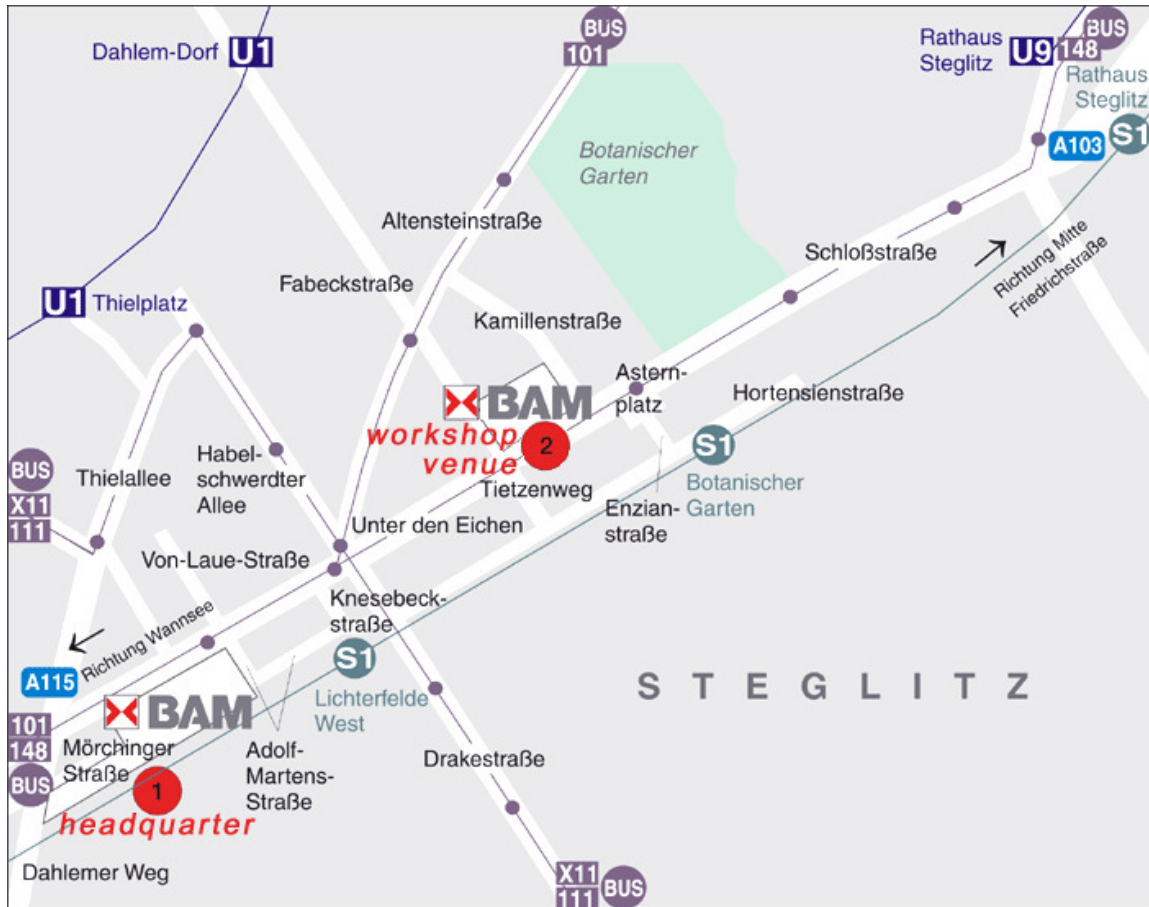
¹² Dr. Michelle Basseville, CNRS Research Director / French Nat. Inst. for Research in Computer Science and Control

¹³ Dr. Olaf Huth, Depart. of Structural Engineering, Swiss Federal Laboratories for Materials Testing and Research

¹⁴ Dr. Jean-Marie Caussinage, Head of Division 'Service Métrologie et Instrumentation', Laboratoire Central des Ponts et Chaussées

¹⁵ Prof. Alessandro De Stefano, Structural and Geotechnical Engineering Depart., Politecnico di Torino

Attainable by:
bus no. 148 stop 'Asterplatz' and interurban train (S-Bahn) S1-station 'Botanischer Garten'



Registration for the Workshop:

Registration is done through VCE Holding GmbH (Coordinator of the SAMCO Network).

Please register by filling in the registration form available at the website:

<http://www.samco.org/download/ws9reg.doc>

via Fax to (+43-1) 90 292 2123.

Open the form with the link above

1. Fill in the form on your PC
2. Print the form
3. Send it via Fax to (+43-1) 90 292 2123.

Final Programme of 11th SAMCO Workshop

Programme of the First Day (May 23rd)

Introduction to NEES and Description of the Software Components

- | | |
|-------|--|
| 09:00 | Welcome and Introduction |
| 09.15 | Introduction to NEES
(Philosophy, Evolution, Equipment Sites) |
| 10.00 | Overview of NEES Cyberinfrastructure
Centre - NEESit
(Services, Goals and General Overview of Software Components) |
| 10.45 | <i>Coffee Break</i> |
| 11:15 | NEESit Software Tutorial
(Collaboration) |
| 12:00 | <i>Lunch</i> |
| 13:30 | NEESit Software Tutorial
(Tele-presence) |
| 14:30 | NEESit Software Tutorial
(Visualization and Simulation) |
| 15:15 | <i>Coffee Break</i> |
| 15:45 | NEESit Software Tutorial
(Central Repository and NEEScentral) |
| 16:30 | NEESit future plans |
| 17:00 | <i>End of first day</i> |

Programme of the Second Day (May 24th)

Technical overview and collaborations

- | | |
|-------|--|
| 9:00 | Overview of NEESit Software Development Practices
(Software Engineering Process, Configuration Management Plan, Required Documentation) |
| 10:00 | NEESit Coding Conventions |
| 10:30 | <i>Coffee Break</i> |
| 11:00 | NEESit Software Architecture
(Overview of Internal Structures and Programming) |
| 12:00 | <i>Lunch</i> |
| 13:30 | Integrating with NEESit
(Authentication, Security, and Central Services) |
| 14:00 | Discussion of Potential Collaboration |
| 15:30 | <i>Coffee Break</i> |
| 16:00 | Continued Discussion of Potential Collaboration |
| 17:00 | <i>Closure</i> |

Final Programme of 2nd SAMCO Summer Academy

MONDAY - September 5th 2005

08:00 -	Optional Mountaineering Tour I
15.00	Birnbachloch (1340m) or Passauer Hütte (2033m)
14:00	Start of Registration at the Registration Desk in the Cultural Centre Lohninghof (Thumersbach / Zell am See, Seeuferstraße 6)
17:00	SAMCO Road Show Dr. Helmut Wenzel (SAMCO Coordinator) VCE Holding GmbH / Austria
ca 18:30	Welcome of Participants

TUESDAY - September 6th 2005

07:00 **Optional Jogging Tour** (in about 60 minutes around the lake)

Room I *Keynote Lecture*

09:00	Advanced Bridge Monitoring Dr. Helmut Wenzel VCE Holding GmbH / Austria
10:30	Coffee Break

Room I *Special Monitoring Projects and System Identification*

11:00	Special Monitoring Projects Prof. Andrea Del Grosso University of Genoa / Italy
11:30	Damage Identification by Vibration Monitoring Prof. Guido De Roeck Katholieke Universiteit Leuven / Belgium
12:00	European Science Foundation Projects: COST Action 534 Prof. Edoardo Proverbio University of Messina / Italy
12:30	Lunch Break

Room I *Experimental Work*

13:30	3-D Full-Scale Earthquake Testing Facility (E-DEFENSE) Dr. Keiichi Ohtani National Research Institute for Earth Science and Disaster Prevention / Japan
13:50	Large Scale Testing of Passive and Active Vibration Damping Systems Performed at ELSA Dr. Vito Renda Joint Research Centre / Italy

14:10	FRENCH TESTING FACILITY “TAMARIS” Current Experimental Activities and Future Upgrading of the Test Facility Jean Claude Queval Commissariat a l'Energie Atomique / France
14:30	Laboratories for Materials Testing and Research in Switzerland (EMPA) Dr. Glauco Feltrin Swiss Federal Laboratories (EMPA) / Switzerland
15:00	Coffee Break
15:30	Monitoring and Assessment of Structures under Changed Loading Conditions Dr. Werner Rücker
16:00	Assessment of Earthquake Resistance of Important Existing Buildings - Case Study Kinderhaus / Hospital Leoben / Austria Prof. Rainer Flesch arsenal research Ges.m.b.H / Austria
16:30	Methodology for Damage Identification based on the Virtual Distortion Method Dr. Przemyslaw Kolakowski Institute of Fundamental Technological Research / Poland
17:00	Day Closure of Event
Room II <i>Bridge Monitoring & Condition Assessment</i>	
13:30	Benchmark Analysis: A Typical Bridge Structure under Environmental Loadings Dr. Francesca Lanata
13:50	Bridge Structures Research Laboratory – Field Research Range and Methods, Quality System Mr Malgorzata Mazanek
14:10	Finite Element Modelling of a Reinforced Concrete Bridge and Comparison with Vibration Measurement Mrs Uta Stewering
14:30	External Cables in Bridge Engineering and Their Dynamic Response Mr Alois Vorwagner
14:50	Condition Assessment Through Modal Analysis of a RC Slab Bridge Before and After Retrofit and Evaluation of the Effectiveness of the Strengthening Intervention Dr. Giovanna Zanardo
15:10	Coffee Break
Room II <i>Seismic Assessment & Power Plants</i>	
15:30	Framework for Assessment and Life Extension of Structures and Industrial Plants Mr Maik Brehm

15:50	Seismic Capability Assessment of the High Voltage Electric Equipment by Experimental Modal Analysis and Finite Element Analysis Mr Ion Manea
16:10	Role of Tidal Phenomenon in Measurements for Structural Control of Objects Prof. Gyula Mentes
16:30	NPP Seismic Monitoring Systems Prof. Dimitar Stefanov
17:00	Day Closure of Event

WEDNESDAY - September 7th 2005

07:00 **Optional Jogging Tour**_(in about 60 minutes around the lake)

Room I

Keynote Lectures

09:00 **Monitoring Projects in Japan**
Prof. Dr.Yozo Fujino
University of Tokyo

09:45 **Monitoring Projects in US**
Prof. Dr. Emin Aktan
Drexel University

10:30 **Coffee Break**

Room I

Forensic Engineering

11:00 **Lessons Learnt from Failures**
Contributions by
Prof. James Brownjohn, Prof. Andrea Del Grosso, Dr. Helmut Wenzel et al.

12:30 **Lunch Break**

Room I

European Research Practice & World Largest Test and Facility Networks

13:30 **A Contractor's View on Monitoring**
Dr. Claude Dumoulin
Bouygues / France

14:00 **Networked 3D Hybrid Simulation Tests of a Full Scale Buckling Restrained Braced Frame**
Dr. Keh-Chyuan Tsai
Taiwan Center for Research on Earthquake Engineering / Taiwan

14:30 **Advanced Bridge Research and Monitoring Activities in Korea**
Dr. H. M. Koh
Seoul National University / Korea

15:00 **Coffee Break**

Room I

Monitoring Projects

15:30	State-of-the-Art and State-of-the-Practice of Bridge Health Monitoring in the Mainland of China Prof. Jinping Ou Harbin Institute of Technology / China
16:00	Variability Characteristics of Structural Health Monitoring Data and Development of Engineering Report Tool for Bridges Mr Nicolas A. Londoño Carleton University / Canada
16:30	ISIS Canada research projects in SHM Dr. Douglas Thomson University of Manitoba / Canada
17:00	Day Closure of Event
Kurpark	Demonstrations
13:30	Measuring Activities of VCE (including BRIMOS) Mr Peter Furtner, Mr Thomas Stiborek, Mr Martin Stöger
15:00	Coffee Break
Kurpark	Demonstration
15:30	Measuring Activities of VCE (including BRIMOS) Mr Peter Furtner, Mr Thomas Stiborek, Mr Martin Stöger
17:00	Day Closure of Event

THURSDAY - September 8th 2005

Room I	Keynote Lectures
09:00	Decision Support Systems Dr. Helmut Wenzel VCE Holding GmbH / Austria
09:45	Network for Earthquake Engineering Simulation (NEES) Dr. Joy Pauschke National Science Foundation / Columbia (USA)
10:30	Coffee Break
Room I	FP 7 and International Collaboration
11:00	Commission Perspective on 7th Framework Programme European Scientific Officer Dr. Georgios Katalagarianakis European Commission Directory, Bruxelles / Belgium
11:45	Panel Discussion International Collaboration, SAMCO Research Agenda, FP7
12:30	Lunch Break
Room I	European Research Projects & Practice

13:30	LESSLOSS - Risk Mitigation for Earthquakes & Landslides Mrs. Olga Ktenidou Aristotele University of Thessaloniki / Greece
14:00	EC Project: SUSTAINABLE BRIDGES Dr. Glauco Feltrin Swiss Federal Laboratories (EMPA) / Switzerland
14:30	Monitoring Applications in Spain Dr. Luis Ortega Geocisa / Spain
15:00	Coffee Break
Room I <i>SAFEPIPES</i>	
15:30	SAFEPIPES Dr. Herbert Friedmann and Dr. Fritz-Otto Henkel (Woelfel Beratende Ingenieure GmbH & Co. KG / Germany), Dr. Klaus Kerkhof (MPA Stuttgart / Germany), Prof. Josef Küng (Johannes Kepler Universität Linz / Austria), Dr. Helmut Wenzel (VCE Holding GmbH / Austria) et al.
17:00	Day Closure of Event
19:00	Academy Dinner
Room II <i>Acoustic Monitoring & Wavelet Analysis</i>	
13:30	Site Installation and Testing of Permanent Acoustic Monitoring Mr Stephan Fricker ETH Zürich / Switzerland
14:00	Wavelet Analysis in Structural Health Monitoring and Damage Detection Dr. Volkmar Zabel Bauhaus-Universität Weimar / Germany
14:30	Guided Waves for Structural Health Monitoring – Theory, System Development, and Applications (including Demonstration) Dr. Frank Schubert IZFP-Dresden / Germany
15:00	Coffee Break
Room II <i>Practical Workshops</i>	
15:30	Data Management & Assessment; GIS Application & Decision Support
17:00	Day Closure of Event
19:00	Academy Dinner

FRIDAY - September 9th 2005

- 08:00 - **Optional Mountaineering Tour II**
- 16:00 Kapruner Törl (2639m)
- 09:00 - **Optional Sightseeingtour**
- 16.15 Old Town of Salzburg

FINAL PROGRAMME OF 13th SAMCO WORKSHOP

Monday, October 10, 2005

08.30 – 09.00	registration of participants
09.00 – 09.10	Welcome and introduction of ZAG Ljubljana Dr. Andraž Legat, director of the Slovenian National Building and Civil Engineering Institute
09.10 – 10.30	Monitoring and control of structures Dr. Helmut Wenzel (VCE), SAMCO project coordinator
10.30 – 11.00	Coffee break
11.00 – 12.30	Monitoring of bridges: Dr. Helmut Wenzel (VCE) Monitoring of buildings: Dr. Helmut Wenzel (VCE) Monitoring of other civil engineering structures: Alberto Marcellini (IDPA) Discussion
12.30 – 14.00	Lunch break
14.00 – 14.30	Transfer to the test structure (bridge over Ljubljanica River – “Harfa”)
14.30 – 16.30	Practical demonstration of bridge monitoring: <i>BRIMOS-Recorder: Ambient vibration measurements of bridges</i> <i>BRIMOS-"Big"-System: Ambient vibration measurements of bridge decks</i> <i>BRIREC software</i> <i>BRIMOS software for evaluation and presentation of results</i> <i>Data acquisition equipment and software for permanent monitoring</i> <i>GREEN-Eye – software for conversion of measured data</i>
16.30 – 17.00	Control and verification of in-situ measurement results
17.00 – 17.30	Transfer of participants to the hotel / to ZAG Ljubljana

Tuesday, October 11, 2005

08.30 – 09.00	Registration of participants
09.00 – 10.00	Activities of ZAG Ljubljana in the area of structural monitoring and control: Geotechnical monitoring: Mojca Ravnikar Turk Corrosion monitoring: Dr. Andraž Legat Monitoring of buildings: Dr. Vlatko Bosiljkov Bridge and traffic monitoring: Aleš Žnidarič

10.00 – 10.30	Visit to the laboratories of ZAG Ljubljana: Lojze Bevc
10.30 – 11.00	Coffee break
11.00 – 12.30	Activities at University Maribor: Dr. Andrej Štrukelj (Univerza v Mariboru) SiWIM bridge weigh-in-motion system: Robert Brozovič (Cestel) Presentation of monitoring results of bridge over Ljubljanica: Peter Furtner (VCE) Discussion of the results and their applicability: Helmut Wenzel (VCE)
12.30 – 14.00	Lunch break
14.00 – 16.00	Compensation of environmental influences: Dr. Helmut Wenzel (VCE) Decision Support Systems: Dr. Helmut Wenzel (VCE) Future developments of monitoring and control of civil engineering structures and buildings: Dr. Helmut Wenzel (VCE) Discussion
16.00	Workshop closure



FINAL PROGRAMME OF 15th SAMCO WORKSHOP

WEDNESDAY 2006-03-29		
18:00 – 21:00	Steering Committee Dinner at Le Dezaley, Restaurant Vaudois	
THURSDAY 2006-03-30		
SAMCO Review		
08:30 – 10:00	History and Achievements of SAMCO; Research Agenda, 7FP	Helmut Wenzel VCE
10:00 – 10:30	Coffee Break	
SAMCO Achievements		
10:30 – 11:00	SAMCO Guidelines	EMPA and BAM
11:00 - 11:30	WP 4 / Certification	Rainer Flesch arsenal
11:30 - 12:00	SAMCO Bridge Management	Livia Pardi Autorstrade
SAMCO Tools		
12:00 – 12:30	Teaching Aids	Helmut Wenzel VCE
12:30 – 13:30	Lunch	
13.30 – 15.00	Visit of EMPA Laboratories	
15:00 – 15:30	Coffee Break	
Partner and Member Contributions		
15:30 – 16:00	Health Monitoring of Complex Structures: Comparing the Static and the Dynamic Approaches via Benchmarking	Francesca Lanata University of Genoa
16:00 – 16.30	Overview of Fibre Optic Distributed Sensing for Structural and Pipeline Monitoring	Daniele Inaudi" Smartec
16.30 – 17.00	Recent Advances in Wireless Sensor Networks and Optical Fibre Sensors	Frédéric Bourquin LCPC
19:00	SAMCO Dinner at Zeughauskeller / Zurich	

FRIDAY 2006-03-31		
Partner and Member Contributions		
08:30 – 09:00	Advances in Operational Modal Analysis since the Start of SAMCO	Bart Peeters LMS International NV
09:00 – 09:30	Assessment and Control of Vibrations in Lively Footbridges	Álvaro Cunha University of Porto
09:30 – 10:00	Assessment of the Earthquake Resistance of Important Existing Buildings - Results from IP LESSLOSS / SP5	Rainer Flesch arsenal
10:00 – 10:30	Coffee Break	
Partner and Member Contributions		
10:30 – 11:00	Advanced Sensor Data Processing for Structural Health Monitoring	Michèle Basseville IRISA / CNRS
11:30 – 12:00	Damage Detection Based on Static Measurements on Bridge Structures	Rolf G. Rohrmann BAM
12:30 – 13:30	Lunch	
New Projects		
13:30 – 15:00	Project Ideas for FP 7	Helmut Wenzel VCE
15:00 – 15:30	Coffee Break	
POST - SAMCO		
15:30 – 17:00	The Future of SAMCO and Foundation of the European Association for SAMCO	Helmut Wenzel VCE
17:00	Departure to Airport	

Location:

EMPA

Swiss Federal Laboratories for Materials Testing and Research
Überlandstraße 129, CH-8600 Dübendorf, SWITZERLAND

Reaching the Venue by Car:

Main connections to the Empa location in Dübendorf (extensive)



Überlandstrasse 129
CH-8600 Dübendorf
Phone +41 44 823 55 11
Fax +41 44 821 62 44
Internet www.empa.ch



by Train:

Interurban trains are running from Zürich HB (Zurich Main Station) to Dübendorf, EMPA every 10 to 20 minutes; you have to change once at Stettbach and take a bus from there (see map below). The journey takes you about 20 minutes.

You will find the connections you need on the website www.sbb.ch

by Plane:

Interurban trains and buses are running from Zurich Airport (Zürich Flughafen) to Dübendorf, EMPA every 10 to 20 minutes. The journey takes you about 40 minutes with changing the means of transport at least once and costs you **CHF 3.80**. You will find the connections you need on the website www.sbb.ch

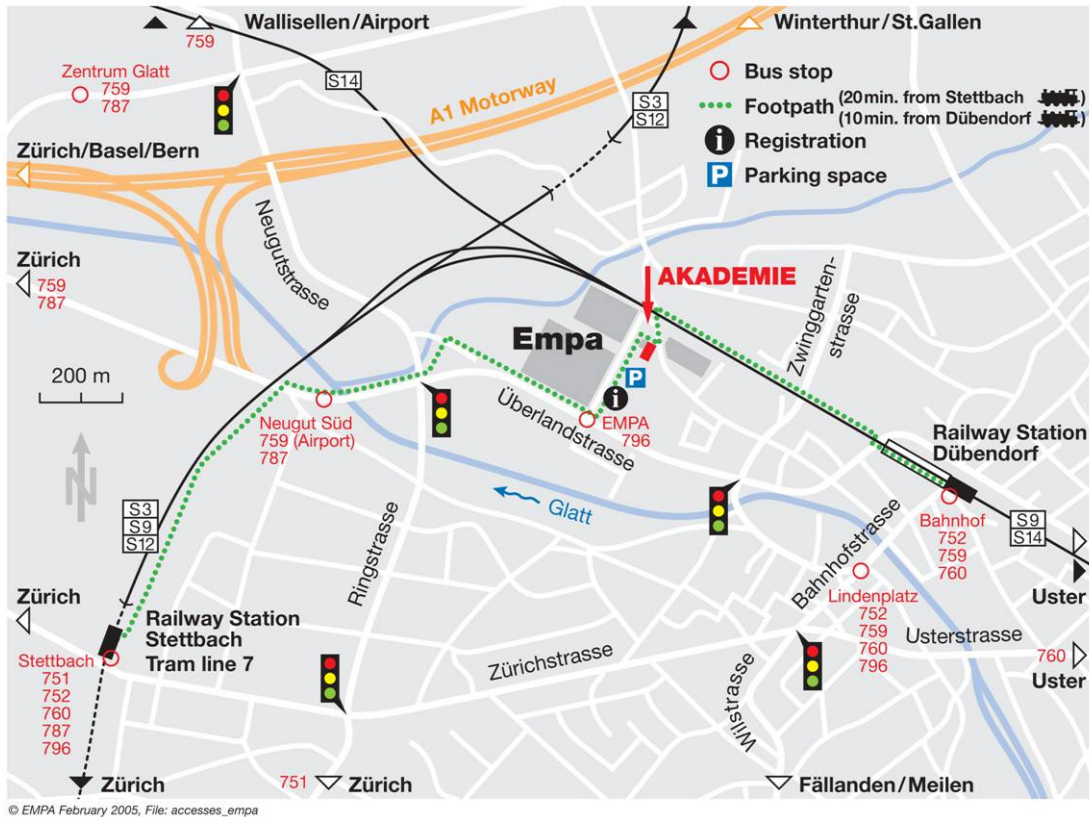
It is possible to book a **taxi** for the transfer between Zurich Airport and Dübendorf, EMPA. The journey takes about 15 minutes and costs **CHF 45.00 to CHF 50.00**. You may pay in CHF, EURO or by credit card (VISA, Master, and American Express).

In order to fix a meeting point you have to make your reservation at least 2 days prior to your arrival on the website www.a-taxi.ch/form.html

Main connections to the Empa location in Dübendorf (local)



Überlandstrasse 129
CH-8600 Dübendorf
Phone +41 44 823 55 11
Fax +41 44 821 62 44
Internet www.empa.ch



Accommodation:

For accommodation the following hotels are suggested and can be booked online:

- **Ibis-Messe Airport:** CHF 112.00 (€ 75.00); a free bus service from and to the airport is provided by the hotel.

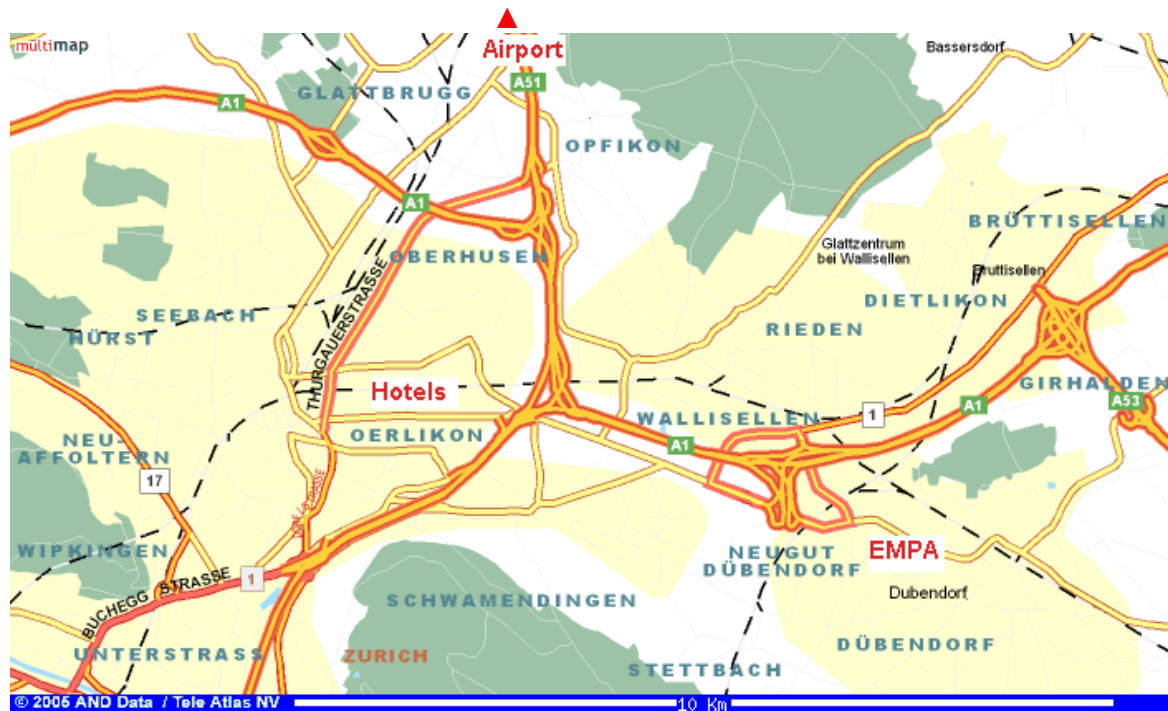
<http://www.ibishotel.com/ibis/index.html>

- **Swissotel Zürich:** CHF 210.00 (€ 140.00); the journey by train to Zurich-Oerlikon takes you 4 minutes and costs you CHF 2.00; the train station is situated in front of the hotel.

http://www.hotels4you.ch/d/includes/content_popup_onlinebooking.cfm?Value=4535

Both hotels are located in Zurich-Oerlikon which is about 20 minutes far from Dübendorf / EMPA by bus shuttle (organised by EMPA and included in the registration fee).

Train connections as well as site plans can be downloaded from the website www.sbb.ch



Contributions and photos of all SAMCO Workshops are available in the SAMCO Database:

<http://samco.jrc.it/>