EUROMET PROJECT
FINAL REPORT

1.	Ref. No.: 663	2. Subject Field: Interdisciplinary metrology	
3	Type of collaboration: CONSULTATION		
4A.	Partners: DFM, PTB, METAS, NPL, UME, MIRS (institutions)		4B. CEC funded? No
5.	Participating countries: DK, DE, CH, UK, TR, SL		
6.	Title: **Video Conference facilities for EUROMET activities**		

7.   Progress:

Activities:
Videoconference equipment (Polycom Viewstation SP128) was implemented and tested at DFM. Technical problems when using the equipment behind a firewall were solved. A **point-to-point** conference between DFM and PTB took place in June 2004 where the advantages of videoconferences as well as more practical issues were discussed. Methods for sharing documents during a videoconference were studied.

In the fall of 2004 a **questionnaire** on videoconference facilities and experiences was sent to all EUROMET contact persons in the field of interdisciplinary metrology. A summary of the questionnaire replies is given in Appendix A.

In December 2004, University of Southern Denmark and DFM participated in a point-to-point conference during an internal DFM-seminar where document sharing in Microsoft Netmeeting was demonstrated.

A **multipoint** videoconference was organized in March 2005 between DFM (5 persons), Aalborg University (9 persons), Aarhus University (2 persons) and Danish Research Network (1 person). Danish Research Network is a high-speed Internet supplier designed for Danish universities and research institutions. Both *Continuous Presence* (four small pictures of each location simultaneously) and *Voice Switching* (one large picture of the location/person who is talking) was demonstrated as well as document sharing (Power Point) among all four locations via Microsoft Netmeeting. The two universities and Danish Research Network have groups with experience in videoconferencing both for teaching (E-learning) and as alternatives/supplements to face-to-face meetings. People with low or no experience were invited to participate at all locations. Experience, expectations, techniques and advantages were discussed.

Experiences:
The questionnaire shows that videoconferencing is not yet widespread within EUROMET although a few NMI's are considering or testing different systems. Only two NMIs seem to use videoconferencing regularly (PTB and SP). More NMIs will have to invest in equipment before EUROMET meetings can take advantage of videoconferencing, but some NMIs are likely to delay such investments until the 'critical number' has already been reached and an immediate advantage can be seen.

It is, currently being considered whether document sharing, **voice** over **IP** and possibly videoconferencing can be used efficiently within the iMERA project. This project could be the test case for a wider EUROMET position on videoconferences.

We have in this project focused on IP-based videoconferencing. Another possibility is **ISDN**-based solutions. However, IP videoconferencing does not require installation and maintenance of an additional ISDN network, and ISDN has relatively high per minute usage fees – in particular for international conferences. IP-solutions allow in principle a simple PC with a web-camera to participate in a conference, e.g. via Microsoft Netmeeting, although this particular software product may suffer from compatibility issues when interfaced to other equipment (see the link to a compatibility survey below). Furthermore, ISDN connections are very

sensitive to the reliability of the multiple data lines used simultaneously for reaching an acceptable bandwidth. In contrast, the IP-solution may suffer package loss resulting in freezing images and pixel errors in an environment with insufficient bandwidth or without Quality of Service (QoS) management. Some companies and institutions require ISDN conferences for security reasons.

Videoconferencing with video and sound usually follows the **H.323 protocol**, and there are generally few problems in interfacing equipment from different manufacturers. If the conference has more than two participants a **Multipoint Control Unit (MCU)** is required. Some systems have an integrated MCU or alternatively an external MCU can be used. DFM has access to an external MCU via the Danish Research Network.

There are several solutions for document sharing. We recommend using Microsoft Netmeeting, which allows document sharing via the **T.120 protocol**. This requires an additional connection independent of the H.323 videoconference connection, and it may require an additional MCU for more than 2 users. Microsoft Netmeeting has the advantage of being standard software on a Windows PC, and it can be configured behind a firewall without compromising security. Whereas difficulties may arise when interfacing Microsoft Netmeeting to other videoconference equipment, we have not observed difficulties when Netmeeting is used for document sharing only.

Because of the technology involved and time delay in the audio and video signals, a videoconference requires more planning, discipline and etiquette than a face-to-face meeting – in particular in the case of more than two participants. Less experienced participants are recommended to do an internet search on **"videoconference tips"** before the first conferences.

The videoconferences mentioned above, and in particular the multipoint conference, was considered a success by the participants. Although the picture quality suffered a bit from time to time, the audio quality was fine and the document sharing worked without problems. Some time must be reserved for setting up the conference, in particular multipoint conferences and document sharing.

Two groups had experience with how much travel costs could be saved. Out of the regular meetings in the National working group on videoconferencing, 1/3 is now held by people traveling; and the Danish Research Network had experienced a substantial cut in traveling for internal meetings for users with several locations.

Videoconferences can be used as a supplement to phone, email and face-to-face meetings, although it cannot replace all such meetings. In particular, videoconferences may be useful as a replacement for some of the regular meetings between groups of people who know each other already and for more informal discussions of documents.

Details on the compatibility of different videoconference systems are available at
http://vcc.urz.tu-dresden.de/vc-systeme/

Recommendations:
We recommend that the use of videoconferences within EUROMET be intensified in the future.

We recommend that both point-to-point and multipoint (up to four sites) be implemented for use within EUROMET.

A workshop is planned to give people a practical experience with the currently available practical possibilities. The workshop should take place at PTB, DFM, and SP, see Appendix B for a proposed agenda.

9. Completion date:	10. Coordinator´s signature: Jan Hald	11. Date: 2005-04-08

Appendix A, Euromet project 663 Final report: Summary of questionnaire replies

Country	Int.Met.Contact	email	Reply	System	
Austria, BEV	Mr. Robert Edelmaier	r.edelmaier@metrologie.at			
Belgium, SMD	Mr. Antoine Condereys	Antoine.condereys@mineco.fgov.be	x	None	-
Bulgaria, NMC	Mr. Stefka Hristova	ncm@sasm.orbital.bg			
Czech Republic	Dr. Frantisek Jelinek	fjelinek@cmi.cz	x	None	2)
European Comission	Dr. Uwe Wätjen	Uwe.waetjen@irmm.jrc.be			
Finland	Mr. Heikki Isotalo	Heikki.isotalo@mikes.fi	x	None	1)
France	Mr. Luc Erard	Luc.erard@bnm.fr	x	None	-
Germany	Dr. Kurt Guckelsberger	Kurt.Guckelsberger@ptb.de		Polycom ViewStation 512	7)
Greece	Dr. Panagiotis Aloupogiannis	Gen.director@eim.org.gr			
Hungary	Mr. Ernö Gáti	e.gati@omh.hu			
Ireland	Mr. Brian Sheridan	Brian.Sheridan@enterprise-ireland.com			
Italy	Mr. Attilio Sacconi	a.sacconi@imgc.cnr.it	x	Microsoft Netmeeting (PC with webcam, microphone, speaker)	6)
Latvia	Mr. Brigita Dragune	Brigita.dragune@lnmc.lv			
Lithuania	Mr. Viktoras Zabolotnas	vz@lvmt.lt			
The Netherlands	Dr. Ed W. B. de Leer	edeleer@nmi.nl	x	Facilities available at TNO (system not specified)	3)
Norway	Mr. Hans Arne Froystein	Hans.froystein@justervesenet.no			
Poland	Ms. Elzbieta Michniewicz	electricity@gum.gov.pl	x	None	-
Portugal	Eng. António Cruz	acruz@mail.ipq.pt	x	None	-
Romania	Ionel Urdea Marcus	urdea@inm.ro			
Slovakia	Dr. Stanislav Duris	duris@smu.gov.sk			
Slovenia	Dr. Janko Drnovsek	Janko.drnovsek@fe.uni-lj.si			
Spain	Mr. Emilio Prieto	eprieto@cem.es			
Sweden	Prof. Hans Andersson	Hans.andersson@sp.se	x	Tandberg 6000 and 2500 (in Borås, Stockholm, Skellefteå and Växjö)	5)
Switzerland	Mr. Peter Demostene	Peter.Demostene@metas.admin.ch			
Turkey	Dr. Sermet Süer	Sermet.suer@ume.tubitak.gov.tr	x	None	-
United Kingdom	Mr. David Nettleton	David.Nettleton@npl.co.uk	x	WebEX system (PC with webcam, microphone, speaker)	4)
Denmark	Dr. Kim Carneiro	kc@dfm.dtu.dk	x	Polycom ViewStation 128	8)

Additional comments

1) Facilities planed in new building (August 2005)
2) Video conference system will be considered, colleagues at University has some experience but low frequency of use
3) Only used internet video conference once, generally don't feel the need
4) Only little experience, WebEX is a pay-per-use system, allows document sharing (whiteboard, shared access to desktop applications), System just about usable (small image, low resolution), 4Mbit/sec bandwidth shared between all users on site.
5) System used 4-6 times/month, has experience in multipoint conferences, use ISDN connection (can do IP, but poor quality)
6) Only experience is a few tests, document sharing via shared desktop in Netmeeting, IP based, 4Mbit/sec (upgrade to 8Mbit/sec planed)
7) In use for 2 years often 1-2 times/day, mostly with Braunschweig department, mostly two-way conferences (find multipoint conferences less useful), Use VNC (Virtual Network Computing) or Visual Concert for sharing documents during conference, use IP and ISDN connections (ISDN: required by some companites/authorities due to security, provides more stable connection)
8) Currently testing equipment and possibilities, focusing on IP based conferences, tests with Netmeeting for sharing documents

Appendix B, Euromet project 663 Final report: Proposed agenda for a workshop on videoconferencing

Three locations is planned to participate in this workshop: DFM, PTB and SP. The participants will travel to one of these locations. The workshop will be organised as a multipoint videoconference. The date for the workshop is to be decided.

Agenda:

Continuous presence mode
1. Introduction by DFM (5 min.).
2. Short presentations of each participant at DFM, including expectations (DFM, 5 min.)
3. Short presentations of each participant at PTB, including expectations (PTB, 5 min.)
4. Short presentations of each participant at SP, including expectations (SP, 5 min.)

Voice-switched mode & shared PowerPoint presentations via Microsoft Netmeeting
5. Technical possibilities and challenges in videoconferencing (DFM, 30 min.)
6. Results from EUROMET project 663 & future expectations (DFM, 15 min.)
7. Experience in videoconferencing at PTB (PTB, 30 min.)
8. Experience in videoconferencing at SP (SP, 30 min.)

Continuous presence mode
9. Discussion and comments from all participants (DFM, PTB, SP, 20 min.)
10. Meeting closed (DFM).