

**PIARC
TECHNICAL COMMITTEE ON ROAD TUNNEL OPERATION (C3.3)**

**MINUTES OF THE FIFTH MEETING HELD IN
SAN JUAN, ARGENTINA, ON THE 27 and 28 MARCH 2006**

1. WELCOME AND INTRODUCTIONS

1.1 Welcome to the new participants

M. BELLINI, the vice dean of the San Juan University welcomed all the delegates and wished them well with their work.

The Committee chairman, D LACROIX, thanked the University for hosting the meeting. He welcomed everyone and invited them each to briefly introduce themselves.

1.2 Organisation of the meeting, time schedule, agenda

Other than the addition of a presentation under Item 9.2, the agenda was accepted as circulated before the meeting.

1.3 Final organisation of the seminar

J. MARCET gave some updated information concerning the organization of the seminar.

1.4 Membership list

A WEST advised that the C3.3 membership list had been updated. With the exception of a couple of inactive members, communications were working well. Members had been nominated by Congo since the last meeting. Attention was drawn to a letter (see attachment 1) sent by the Secretary General to all first delegates advising them of those members who were not contributing and requesting that they re-confirm their membership or make new nominations by the end of March. The outcome of this initiative was awaited.

There had been dialogue between the C3.3 secretaries and the WG secretaries to confirm the membership of the WG's. These agreed lists would now be maintained by the WG secretaries on their web pages.

The full list of attendees was:

Members of the Committee

D LACROIX	(France)	Chairman
M ROMANA RUIZ	(Spain)	Spanish speaking secretary
P SCHMITZ	(Belgium)	French speaking secretary
A WEST	(UK)	English speaking secretary
J MARCET	(Argentina)	
R HÖRHAN	(Austria)	
B BLASZCZAK	(Belgium)	

J THOMSEN	(Denmark)
B FALCONNAT	(France)
P REBRION	(France)
J KRIEGER	(Germany)
T MIZUTANI	(Japan)
E WORM	(Netherlands)
E NORSTRØM	(Norway)
W LIU	(Peoples Republic of China)
A MEIRA	(Portugal)
A PINTO DA CUNHA	(Portugal)
R LOPEZ GUARGA	(Spain)
B FREIHOLTZ	(Sweden)
A JEANNERET	(Switzerland)
U WELTE	(Switzerland)
J ROHENA	(USA)

Associated Members

W DE LATHAUWER	(ITA, representing C BERENGUIER)
J-C MARTIN	(France – WG1)
I DEL REY	(Spain)
A BENDELIUS	(USA – WG6)

Other attendees

E JACQUES	(Belgium – WG6)
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2. APPROVAL OF MINUTES OF THE 4th MEETING (Dubrovnik, 6-7 October 2005)

The minutes of the 4th meeting in Dubrovnik were accepted.

3. UPDATE ON RELATED ACTIVITIES OF OTHER ORGANISATIONS

3.1 Research activities funded by the European Union

3.1.1 Thematic network Safe-T

P SCHMITZ, who represents C3.3 on Safe-T, showed the new web site flyer (see attachment 2). The web site can be visited at www.safetunnel.net. The work packages being undertaken are described on the flyer. The project is nearing completion but there are concerns about delivery, with the technical co-ordinator chasing the deliverables to no effect. Whilst it had been made clear that C3.3 would be prepared to help where appropriate, there had been no request received for assistance to date. All reports will be freely available once finalised.

3.1.2 Research Project UPTUN

E WORM gave a short presentation setting out the project activities and progress (see attachment 3). The project will finish shortly, but the momentum will be kept through COSUF. A symposium, co-organised with Safe-T and COSUF is planned for May in Lausanne, Switzerland.

In response to a query by J KRIEGER, E WORM advised that the documents being produced were not currently available to the public but would be in due course. This caused W DE

LATHAUWER to wonder whether the Safe-T, UPTUN and FIT documents, as well as those from the other projects, would be out of date when available (e.g. published 3 to 4 years after completion). E WORM confirmed that there was currently no programme for publication.

3.1.3 EuroTAP

P SCHMITZ had been invited to a seminar hosted by EuroTAP in February (see attachment 4). He made a presentation on his experience, through 3 inspections, with the EuroTAP process. Having described his experiences, he concluded that the inspections could be turned into a “win/win” situation, even if you did not fully agree with the methodology. The process was becoming interactive with the surveyors being prepared to discuss and negotiate their assessment and that they were also prepared to discuss and agree any press releases. He had gone some way to convincing EuroTAP that it was not necessary to have a single risk analysis methodology for the whole of Europe. Other C3.3 members were at this seminar and the minutes are available on the EuroTAP web site <http://www.eurotestmobility.net/eurotest.php?itemno=111&lang=EN>.

EuroTAP have created and are distributing CD's and videos covering tunnel safety. P SCHMITZ disagreed with some of the advice being given in this material. EuroTAP claim that they are liaising with PIARC but this is through B THAMM who is no longer a member, and was more closely affiliated with the EU when he was. P SCHMITZ had indicated his willingness to distribute a questionnaire to tunnel operators, manager, etc. but a copy had not been received by the time of this meeting (Post meeting note: The questionnaire has now been received).

M ROMANA advised that the EuroTAP leaflet had now been translated into Spanish.

J KRIEGER, who also attended that seminar, pointed out that EuroTAP had updated their methodology and claimed that they had taken into account all of the PIARC queries. He felt that this needed to be evaluated by C3.3 to reassess our position. R HORHAN confirmed that EuroTAP had not contacted WG2 who were tasked with liaising with EuroTAP. He agreed that WG2 would contact EuroTAP and put the matter on the agenda for their next meeting. They would need to see the methodology before the meeting. A JEANNERET cautioned against meeting too frequently with EuroTAP as this possibly inferred a greater level of collaboration than actually existed; C3.3 must maintain its independent position. D LACROIX recalled that at the last official PIARC-EuroTAP meeting in Rome in December 2004, an agreement had been made that EuroTAP would be invited to present their progress at a WG2 meeting. He felt that this meeting of WG2 with EuroTAP was now necessary.

B BLASZCZAK reported having been inspected in 2003 and warned to expect some follow-up. In time, he received 20 questions to identify any changes. It was difficult to answer these questions sensibly and there had been no further contact through which the answers could be clarified. He felt this was unprofessional and was concerned that there could be misunderstandings. P SCHMITZ believed that these questions were only asked to update the EuroTAP data base on their web site. E NORSTRØM confirmed that they did send follow-up questionnaires.

3.1.4 FIT

D LACROIX advised that there had been a long delay between completion of the final report and its publication, which was still awaited. No date had been fixed, so it could be later in 2006 at the earliest. With the document written in 2003/4 and finalised in 2005, this delay was of concern.

3.2 New ITA Committee on Operational Safety of Underground Facilities (COSUF)

D LACROIX recapped upon the formation of COSUF as reported at the last meeting. The steering committee has now met several times and the launch is now planned for a seminar jointly organised with UPTUN and Safe-T at Lausanne, Switzerland, on 30/31 May 2006. An invitation will be placed on the ITA web site in due course. This event will cover developments to date and solicit the opinions of the attendees as to the way forward. People will be invited to get involved.

W DE LATHAUWER questioned whether membership had to be approved by the ITA national committees. D LACROIX was not aware of this and indicated that he would confirm if it was the case.

3.3 Other ITA activities

W DE LATHAUWER advised the following:

- The next General assemblies and World Tunnelling Congresses are planned for Seoul, Korea at the end of April 2006, Prague in May 2007 and New delhi in September 2008.
- In Seoul, there will be a modification of the statutes and by-laws to incorporate on one hand the operation and management of tunnels, and on the other Committees, of which COSUF will be the first.
- In Seoul the Open Session will be devoted to Risk Management (mainly construction).
- Several Task Forces are working, namely on the preparation of a seminar (Fire Protection” in London on 6.10.2006, on “Underground Worldwide” for the web site and on Master-courses at various universities.
- The annual formal meeting between PIARC and ITA had taken place only a few days ago. The aim was to follow-up the Memorandum of Understanding between the ITA and PIARC. Minutes of the meeting between C BERENGUIER and D LACROIX will be placed on the web site once agreed. W DE LATHAUWER would continue as C BERENGUIER’s representative on C3.3, the ITA will be represented at the Paris Congress and co-organise the Special Session on Safety Risks. There are links between the ITA and PIARC web sites. Generally, the ITA and PIARC will mutually support activities and reports. PIARC will continue to be represented at each of the ITA General Assemblies.

3.4 Other activities

A JEANNERET reported that the need for a test site had been identified in the Swiss Tunnel Task Force back in 2000. The Swiss Government had now approved 2 sites for training; one on an existing site and the other to be purpose built.

J KRIEGER drew everyone’s attention to a research project into full scale testing facilities for tunnel safety called L-surf. Details can be found on their web site (www.l-surf.org).

4 PROGRESS OF THE WORKING GROUPS

4.1 WG1 Tunnel operation

J-C MARTIN gave a presentation (see attachment 5) of WG1 activities and progress to date.

Monitoring sheets had been circulated prior to the meeting. Progress was reported as follows:

- Task 1. A guide for organising, recruiting and training operating staff. Draft (version 5) would be presented later (see Item 7.1.1 below).

- Task 2. Recommendations to operators of highly trafficked urban tunnels, including maintenance and selection of equipment. There was discussion about the title of this document but it was agreed that it would remain as above with the “including maintenance and selection of equipment” deleted. The draft was not ready for presentation at this meeting as originally planned. It would be presented as a first draft at the next C3.3 meeting in Chongqing. This being the case, it will not be ready for publication before the Paris Congress.

B FALCONNAT felt that references to the earlier document could avoid duplication of references to equipment selection. J-C MARTIN did not think that this would be a problem. The new report would focus on aspects specific to highly trafficked urban tunnels.

4.2 WG2 Management of tunnel safety

R HÖRHAN presented the 3rd progress report for WG2 (see attachment 6). Progress on individual tasks was as follows:

- Task 1. General principles for an integrated approach to road tunnel safety. Draft 8 had been submitted for approval at this meeting (see Item 7.1.2 below).
- Task 2. Report on current practice and recommendations regarding risk analysis. The March 2006 draft had been submitted for approval at this meeting (see Item 7.1.3 below).
- Task 3. Promotion of the OECD / PIARC QRA and DSM software. Details of the software were now on the PIARC web site. An article had been published in Routes/Roads.
- Tasks 4, 5 and 6 had now been combined into one report. The March 2006 draft of this document had been submitted for approval at this meeting (see Item 7.1.4 below).

D LACROIX noted that the monitoring sheet needed to be revised to reflect all reports being submitted for approval at this meeting. He also noted that the question of the division of responsibilities between the various tunnel roles had still to be addressed. R HÖRHAN advised that a questionnaire was to be discussed at the next meeting. The earliest time at which this could be circulated would be next year with reporting by the end of the cycle.

A WEST reported that the software was still not in its required final format. Ineris had all the necessary information and we still awaited the revised CD ROM. As a consequence of this, PIARC were passing orders through to R HALL for processing. It was agreed that this matter needed to be expedited with some urgency. The draft contract for model support by Ineris was being revised by R HALL. The UN ECE are scheduled to introduce tunnel categories in the European agreement on transport of dangerous goods by road (ADR) by 1.1.2009. This is another follow-up of the past joint OECD/PIARC research project, which proposed these categories. It looks very likely that the QRAM, which is already in use in several countries, will be adopted in the UK as a result of this.

Following the Routes/Roads article, P SCHMITZ queried the success of the PIARC web site in promoting the software. He has not received a response to date.

B FALCONNAT noted that the documents had only been issued for approval 2 weeks before the meeting and that left insufficient time for this to be done.

4.3 WG3 Human factors for tunnel safety

E WORM gave a short report of the activities and progress made by WG 3 (see attachment 7).

- Tasks 1 and 2. Human factors and tunnel safety. Draft 4 of this document had been submitted for discussion (see Item 7.2.1 below).

- Task 3. Information and education. No progress to report.
- Task 4. Intervention teams. This will be presented at the next meeting.

D LACROIX suggested that, with regard to Task 3, consideration needed to be taken of the leaflet produced by EuroTAP. WG3 should decide whether to continue developing its own leaflet or liaise with EuroTAP. P SCHMITZ noted that the same applied to the video which were very expensive to produce. E WORM agreed to discuss the matter at the meeting in June.

4.4 WG4 Detection, communication, safety equipment

U WELTE gave a progress report on the work of WG4 (see attachment 8) as follows:

- Task 1. A few changes had been made to the final draft of the report “Directional signing in road tunnels” presented in Dubrovnik. This document was now ready for translation.
- Task 2. Lay-bys and SOS stations. The final draft (March 2006) had been submitted for approval at this meeting (see Item 7.1.5 below).
- Task 3. Visual and audible means to promote safety in tunnels. This was now merged with WG3 Tasks 1 & 2 (see Item 7.2.1 below).
- Task 4. Video detection: benefits and limits. U WELTE presented the proposed contents of this report (see attachment 9) for discussion.

With regard to Task 4, U WELTE made it clear that the technology was changing rapidly and that any findings and recommendations would have to be issued quickly if they were to remain relevant. In response to a query by A JEANNERET, U WELTE agreed to clarify what was meant by the proposed section entitled “advantages / disadvantages”. J-C MARTIN asked if the report could consider procedures and equipment as two stages to keep the reporting time to a minimum. D LACROIX had similar thoughts and suggested determining what the needs are, establishing the suitability of the available systems and then investigating future developments. U WELTE reflected that the authorities have already defined their requirements, so system compliance is the obvious route forward. Other observations included:

- The report will not address infra-red detection (I del REY).
- Monitoring vehicles entering and leaving a tunnel enables the operator to determine what vehicles remain in the tunnel in the event of an incident (E NORSTRØM).
- The scope was intentionally limited to video detection, rather than the broader accident/incident detection, to make it manageable (J THOMSEN).
- It was agreed that the scope would not include discussion of the legal position with regard to data collection (R HÖRHAN).
- The extent to which the activities of UPTUN WP1 cover this topic needs to be established (D LACROIX).

B FALCONNAT concluded the discussion by stating that the report should provide very practical advice to enable operators to overcome spurious claims by suppliers.

4.5 WG6 Ventilation and fire control

A BENDELIUS gave a presentation on the activities of WG6 (see attachment 10). Progress to date was:

- Task 1. Guidance on management of tunnel pollution. The final draft (Version 2.9 1.2.6) had been submitted for approval at this meeting (see Item 7.1.6 below).
- Task 2. Operation strategies for tunnel ventilation. The latest draft of this document had been submitted for discussion (see Item 7.2.3 below).
- Task 3. Recommendations on fixed fire fighting systems. The latest draft (Feb 2006) of this document had been submitted for discussion (see Item 7.2.4 below).

- Task 4. Design fire. This is not progressing as well as hoped. A draft contents had been produced but was still under development.
- Task 5. Recommendations on pavement impact on tunnel fire. The latest draft would be presented later for approval (see Item 7.1.7).

The CD-ROM of the collaboration with the NFPA at the conference in Las Vegas was now available.

A BENDELIUS concluded by reminding everyone that the report completed at the end of the last cycle (2003) had still to be published. This was a matter for serious concern.

5 SEMINAR IN CHONGQING (China 18-20 October 2006)

W LIU described the arrangements for the seminar in Chongqing (see attachment 11). He distributed the seminar leaflet (see attachment 12) which gave details of the seminar aims and topics, organising committee and call for papers. The event would be held at the Hilton Hotel in the Yu Zong district of Chongqing. The agenda and travel arrangements were also set out (see attachment 13).

There will only be one series of sessions (not parallel sessions). D LACROIX pointed out that we would need to review the outcome of the call for papers to determine what session topics would be appropriate and who might present on behalf of C3.3. Preliminary suggestions included:

- Durability and reliability of tunnel equipment (U WELTE)
- Equipment maintenance documentation (J-C MARTIN)
- Ventilation of long tunnels / methods of improving safety (B FALCONNAT)
- Fire in tunnels (A BENDELIUS)
- Ventilation of long road tunnels (A JEANNERET)

P SCHMITZ agreed to send an e-mail to all members requesting proposals, once the session topics are decided and the results of the call for papers available. This matter needed to be resolved by May / June at the latest.

6 ORGANISATIONAL AND OTHER MATTERS

6.1 Preparation of the 2007 World Road Congress

D LACROIX advised that the PIARC Executive Committee had resolved that there would be no additional sessions at the Paris Congress. Consequently, C3.3 now has two sessions; the committee session and the special session. We might also be asked to make some contribution to the strategic theme session although there was no information upon this at the moment. The material presented at the special session should not duplicate that presented at the committee session.

Consideration was given to any possibility there might be for contributing to the other special sessions.

- Training of road professionals. Could the work of WG3 be relevant?
- Technology jumps. Could WG 4/6 contribute?

It was agreed that the chair and secretaries would investigate these questions at the meeting planned in June in Berlin for the technical committee chairs and secretaries.

C3.3 would not be issuing a call for individual papers.

With regard to the special session, D LACROIX proposed an alternative title of “Management of operational risk in road tunnels” which was generally well received. A WEST reported having written to AIEF/ERA to see if they would be interested in attending, but had still to receive a response. W DE LATHAUWER clarified that ITA should be contacted about the session, and not COSUF.

6.2 Preparation of the 2008-2011 PIARC Strategic Plan

A WEST explained how PIARC were starting to prepare a strategic plan for 2008-2011 with a questionnaire to the technical committees (see attachment 14). The meeting then went on to consider each of the questions in turn:

1. Expertise of the technical committee. The committee discussed 3 possible areas of expertise which might help; namely, firemen, traffic planners and written communications.
 - a. Firemen. Whilst there had been some success with obtaining assistance in this area, it was frequently felt to be at a detail, rather than strategic, level, and that there was concerns about the authority of the advice. It was felt that funding participation in meetings was a key issue. Could PIARC petition at a higher level to help with this matter?
 - b. Traffic planners. Opinions varied as to the contribution of traffic planners to the work of C3.3. W DE LATHAUWER noted that the need for their assistance had been identified in a number of areas. However, P SCHMITZ noted that those PIARC committees who had this expertise, had shown no interest when approached on this matter.
 - c. Written communications. We do not have a satisfactory appreciation of how our reports are received. We have a feeling that they could be produced better to improve understanding and usage. A JEANNERET and E NORSTRØM felt we needed to understand our audience better. The quality sheets and result survey might help in this matter.
2. Developing the work programme. B FALCONNAT reflected the thoughts of many when he said that the period for the management of topics for reporting was too short within a cycle. Actual work could not start earlier than one year after a World Road Congress, and had to be finalised at least one year before the next congress, which left little time available. Additionally A BENDELIUS noted that 4-year cycles inhibited long range thinking and planning. A JEANNERET suggested breaking up topics over cycles.
3. Considering the wide scope of stakeholders. The committee tends to concentrate on the requirements of central Europe. E NORSTRØM reflected that even Norway has some problems with this. There was a general feeling that the monitoring sheets could have been used more effectively. A WEST suggested the formation of a challenge group within the committee but P SCHMITZ had reservations about the workability of this. A WEST felt we did not know what others (e.g. developing countries) actually needed and, in the end, just guessed. J MARCET believed that developing countries possibly did not know what they wanted anyway. He mentioned that it was difficult for these countries to plan for people to attend PIARC meetings and advocated closer relationships with Universities in these countries as a way forward. B FALCONNAT warned that when thinking of the needs of developing countries, we should have in mind that they often do not want “discount tunnels”, i.e. tunnels with lower equipment and operational levels. There was discussion about greater involvement of corresponding members from developing countries. The first delegates might be used to identify and encourage these links.

4. Communication and information flow. Both P SCHMITZ and M ROMANA questioned how much we actually wished to know about the activities of the other committees. There was a general feeling that the user friendliness could be improved. A JEANNERET felt too much effort was required to trace information. It was regretted that there was no access to other closed areas. With regard to external communication, A PINTO da CUNHA felt that visitors to the site should be able to quickly establish what they might expect from it. I del REY felt it would be helpful if subscribers to the site could be updated on changes to enable them to immediately appreciate where they should focus their attention. If available, a review of the number of “hits” to each area might be enlightening.
5. Priorities to address in the new strategic plan. There was some confusion over the level at which this question was being directed (i.e. strategic or detail). A BENDELIUS felt we needed to identify and understand our clients as a priority. This opinion was echoed by I del REY who said we needed to know who our audience were. D LACROIX believed we were suffering from information overload. A JEANNERET said we should improve our reports making them briefer but better. P SCHMITZ felt that it would be interesting to check the sales figures for our various reports to see what lessons we might learn. J MARCET believed advice at a level appropriate for a generalist, the status of most tunnel managers / operators, would be a sensible target. With regard to specific issues, U WELTE suggested that increasing numbers of tunnels in Europe were now requiring maintenance which might be a fruitful topic. A WEST suggested sustainability as an issue which should be attracting increasing attention. Safety would naturally remain a key issue. D LACROIX felt that a large number of reports were being produced by C3.3, the European research projects and thematic networks, ITA, etc. and that a task could be to draw syntheses and give a general view of the current state-of-the-art.
6. Improvements to the strategic theme structure. C3.3 has always felt, and continues to feel, that it does not fit comfortably into the theme structure. Linkages have always been somewhat contrived.
7. Improvements to the system as a whole. D LACROIX asked the question, why couldn't PIARC absorb COSUF into its' organisation, although it had been proposed to host it. On reflection it was widely held that it was because the organisation is too top orientated, has limited flexibility and that this inhibits external involvement. This is likely to limit future growth of the organisation. At a lower level, A PINTO da CUNHA proposed greater involvement of the WG members at the C3.3 meetings to help in the assessment of the reports. Whilst not averse to this suggestion, there was a feeling that the practicalities of meeting attendance would limit its application.
8. Additional information. No comment.

6.3 Contribution of C3.3 to the improvement of PIARC dictionaries and lexicons

M ROMANA reported that he had received terms for inclusion in the dictionary from WG 1 and 6. He had abstracted some terms for WG 2 from documents he had received. He had sent these to the Terminology Committee but received no response to date. There is, currently, no programme for the incorporation of these terms in the dictionary.

D LACROIX requested that WGs 2, 3 and 4 send their lists of 10 terms to M ROMANA as soon as possible.

6.4 Follow-up of the quality assurance of C3.3 publications

P SCHMITZ stressed the importance of the monitoring sheets. The PIARC General Secretariat will be following progress carefully on the basis of these sheets. Monitoring sheets have now been generated for all of the C3.3 deliverables. These will be, particularly, of interest when determining which documents will be available for the Paris Congress.

Evaluation sheets will have to be completed by the peer reviewers. The peer reviewers will have to be appropriately qualified. It must also be remembered that part of the review will be the acceptability of the French and English. D LACROIX reminded the committee members that the C3.3 reviewers were also a fundamental part of the process. Their performance will be checked as the reports progress. P SCHMITZ drew everyone's attention to the sheet produced by A BENDELIUS to identify and monitor the performance of the reviewers of his documents. He suggested that this was adopted as a template by the other WGs.

In response to a query by A BENDELIUS, P SCHMITZ advised that actual delivery dates should be recorded and the forecast delivery dates revised once it became clear that those listed were completely unattainable.

6.5 Format of reports

A WEST set out the situation with regard to annexes, as advised by J-F CORTE (see attachment 15). Every effort should be made to keep reports as succinct and simple as possible. If annexes are unavoidable, they can be included solely in their original language, whether this be English or French, if the translation effort would be too large. If such annexes are not necessary for an understanding of the report but are considered of interest to some readers, then they may be made available in electronic form on the PIARC web site in their original language with a short bi-lingual introductory text. The exact form the web site location has still to be resolved.

D LACROIX went on to introduce the new guidelines for report formatting which is now available on the PIARC web site. This forms part of the PIARC Blue Book. It includes a template for the production of reports. All of those involved within the production of the reports will be identified in the reports together with their responsibilities. WG leaders should distribute this document to their WG members as all future documents will have to be in this format.

Finally, PIARC has decided that all their documents will now be freely available on the web site in pdf form. All those documents published between 1990 and 2003 will be available shortly.

E NOSTROM pointed out that once in electronic form it would be possible to use colour pictures / diagrams and not just the black and white as at the moment. D LACROIX believed this was a good point but that it would still, probably, be necessary that such pictures / diagrams could be understood if reproduced in black and white. He would seek clarification on this point.

6.6 Articles for Routes / Roads and other publications

D LACROIX reported that a letter (see attachment 16) had been received from the PIARC secretariat regarding articles for Routes/Roads. This included advice on the selection of articles.

The WG article on the QRAM was in the January 2006 issue. There were no plans for any other articles unless the decision was taken to produce one on the impact of pavements on fires (see Item 7.1.7 below).

6.7 PIARC and C3.3 website

P SCHMITZ reported that there was now a new public page on the PIARC web site to deal with the QRA model for dangerous goods. He would welcome any comments on it. Web site maintenance was likely to be more onerous than before. Everyone should visit the new site and send any comments they might have to A WEST for inclusion in the response to the PIARC questionnaire.

P SCHMITZ had received no comments to date on the private members web site. The same format had been adopted for each WG. The C3.3 site was more developed than that for any of the other technical committees. D LACROIX led the members in thanking P SCHMITZ for all the effort he had made to place us in this position.

P SCHMITZ advised J ROHENA that we would only be likely to get very limited access to the other technical committee web sites. He then explained that document version control needed attention and was the next priority.

7 EXAMINATION OF SPECIFIC TECHNICAL TOPICS

D LACROIX started this section by reminding everyone to limit their comments to key issues. Detailed comments should be sent in writing directly to the WG leader.

The WG leader was invited to briefly present each of the documents to be considered. Following this presentation he should list those C3.3 members (national, corresponding and associate) who had agreed to review their document and those who had responded to date. Then, where possible, one of the reviewers would report their comments on the document under consideration.

7.1 Reports submitted for the approval of C3.3

7.1.1 Guide for organising, recruiting and training tunnel operating staff

J-C MARTIN set out the objectives of the report and the comments made upon the earlier draft together with details of how these comments had been addressed (see attachment 17).

The C3.3 reviewers were identified as B FALCONNAT, P REBRION and G ZIAKAS. Comments had been received from REBRION and G ZIAKAS on the earlier draft at Dubrovnic. Comments on the later draft had been received from B FALCONNAT who presented these comments at this meeting (see attachment 18). The main points were:

- The need to add and emphasise the relevance and importance of training.
- To provide some additional detail of the situation in France (annex)
- To complete the Spanish and Swiss annexes.

With the resolution of the above the reviewers recommend that the document should be approved for publication.

The WG members responsible for the Spanish and Swiss annexes were identified as J ALMIRALL and H-R SCHEIDEGGER respectively. I del REY and A JEANNERET agreed to speak to them.

There was discussion about the separation of traffic and technical management functions (pp19/20). In some tunnels they were completely separate teams (B BLASZCZAK) while in others they work very closely together (U WELTE) particularly in emergencies. It was agreed that a short explanatory paragraph would be added to the report.

E NORSTRØM noted that this report appeared to relate to tunnels with equipment. Would it be equally valid for tunnels without equipment? J-C MARTIN said he would look into the matter.

It was agreed that the annexes B were of value but would not be published with the report because they were rather long. They should be placed on the PIARC web site. P SCHMITZ said that he would establish the arrangements for doing this. D LACROIX reminded the authors that whilst the text of such an internet annex would be only in English, a bi-lingual introduction had to be written. He then said that all C3.3 reviewers should provide their comments to J-C MARTIN by mid April. If they had no comments they should advise this accordingly. Similarly, the missing annex sections should be provided by mid April. Peer reviewers still need to be identified. A WEST agreed to try and identify a UK tunnel operator to carry out a review. J-C MARTIN indicated, in response to a suggestion by B BLASZCZAK, that the emergency services were not the target audience of this document so it would not be appropriate to find a fire brigade reviewer. The peer reviewer validation forms would have to be completed. Finally, the WG leader will have to update the monitoring sheet.

7.1.2 Integrated approach for tunnel safety

R HÖRHAN briefly presented the document (see attachment 19). The C3.3 reviewers were then identified as A DUSEK, T MIZUTANI, R HAUG, W LIU, A PINTO da CUNHA, S PETELIN, A DEBS, D SARIC and C BERENGUIER. Only A DEBS had responded but without any comments.

E NORSTRØM consulted W LIU, A PINTO da CUNHA and T MIZUTANI at the meeting before presenting their comments on the report (see attachment 20). These were as follows:

- The report is well written and understandable.
- The safety principles are described satisfactorily.
- A scope and foreword should be provided.
- In Chapter 7, it should be stressed that the operator should be involved at an early stage.
- As-built drawings should be included in Table 7.
- The drawing numbering needs to be checked.

With the resolution of the above, the reviewers recommended that the document should be approved for publication.

I del REY raised the issue of the use of both the safety circle and safety chain analogies, and it was accepted that reference to the chain would be deleted. With regard to the safety circle, D LACROIX felt that the word “repression” should be replaced by “emergency response” and that there should be a further activity, “evaluation”, between “after care” and “pro-action” when lessons are learnt.

I del REY agreed with A WEST in finding the document strongly biased towards Europe.

A PINTO da CUNHA felt the annexes were very important in demonstrating different practices and should be made available either as part of the report or separately on the PIARC web site.

W DE LATHAUWER had a number of comments:

- The descriptions of the European research projects are too long and covered elsewhere in other reports. He felt it would be better as an annex on the PIARC web site.
- In the discussion on tunnel accidents (p6), it was not clear how changes to the construction criteria might have made things better. It was agreed that the wording should be changed.
- In Table 5.1 the meaning of the word “exceedances” should be explained.
- Is it necessary to include the formula on page 30?
- What is the relevance of Table 6.1?

With regard to Table 6.1, A JEANNERET asked why education, vehicles and other matters which might improve safety were not included. E NORSTRØM said that these items were not included as they lay outside the scope of this work, and that the table was important although it should be reviewed by the WG. A PINTO da CUNHA was worried about some of the repressive systems listed.

D LACROIX concluded that the document could not be approved until it had been properly reviewed. All of the C3.3 reviewers should respond with their comments. He wondered whether it should be sent to the EU for review through the EU Committee on Road Tunnel Safety (created by Directive 2004/54/EC) linkage. It was agreed that it would be first necessary to establish the C3.3 position. The WG would have to take on board the reviewers comments before presenting the report for final approval by C3.3 at the Chongqing meeting, then sending it to EU. R HÖRHAN agreed to bring forward the WG meeting from September to June so that this could be accommodated. The document would then be sent to the peer reviewers.

7.1.3 Risk analysis for road tunnels

R HÖRHAN gave an overview of the report (see attachment 21). The C3.3 reviewers were B FALCONNAT, J KRIEGER, G GRESCHIK, W LIU, S PETELIN, R LOPEZ GUARGA, J ROHENA, A DEBS, D SARIC and C BERENGUIER.

J KRIEGER started his presentation on behalf of the reviewers by pointing out that the document had only been available for 2 weeks, which was insufficient time to give a satisfactory review. He observed that:

- The layout was OK.
- It was understandable depending upon the reader for a difficult topic.
- It presented a holistic approach for “tunnel” analysis and not just risk.
- It would benefit from the addition of an executive summary (Section 1.5 might form a basis for this).
- Figure 2 was difficult to understand and not in line with fig. 3.
- The majority of the terminology should be relocated to an annex.
- Fig. 3 was central to the document and could have clearer text.
- Section 3.2.5 (Italian), the table needs completing.
- Section 3.2.6 (UK), needs clarifying.
- Chapter 4 appears redundant following Section 3.2.
- The case studies should use a standard presentation format, possible with a short introduction.
- The conclusions were OK.

W DE LATHAUWER had some concerns about p7, line 1, which was repeated in each of the reports and he considered to be incorrect. R HÖRHAN said that the wording would be changed but that the common introduction was being used for each of the reports on purpose.

D LACROIX wished that the case studies be moved into an annex with only, say, half a page per case study in the text. J KRIEGER felt a common template, identifying the differences would help. E NOSTROM added that a Norwegian case study had been sent. R HÖRHAN agreed to look into this.

With regard to terminology, I del REY pointed out that “risk analysis” was not used consistently (cf. p14 to p22).

D LACROIX concluded that the document could not be approved, especially as it had not been fully reviewed by the appointed C3.3 reviewers. Although it was a good report, it was not very user friendly or for beginners. To this end it should be simplified. There should be an introduc-

tion and the terminology should be put in an annex, with only the key words (possibly those in Fig. 3) retained in the text. Perhaps splitting the report into two parts would help. The first part would be suitable for beginners or those only requiring a general understanding of the subject. The second part would contain more detail. Naturally, the document should remain consistent with other reports, especially the report on Integrated Approach, with which there are currently some inconsistencies. The current report is very much focused on European practice and should be made as international as possible. The C3.3 reviewers should complete their review and submit their comments by the end of April. WG2 would then take the comments into account at their next meeting in June. The revised version would then be sent to the peer reviewers. The final version will be presented to the C3.3 Chongqing meeting for approval.

7.1.4 Tools for tunnel safety management

R HÖRHAN gave an overview of the report (see attachment 22). The reviewers were identified as A DUSEK, A FOCARACCI, A PINTO da CUNHA, J EMERY and H BUVIK. A PINTO da CUNHA presented (see attachment 23) his comments, he had not received any feedback from the other reviewers except for a communication from A FOCARACCI:

- There were many minor errors which needed to be corrected (e.g. details of those involved).
- There were problems with the introduction (see W DE LATHAUWER comments in 7.1.3).
- Italy cannot comply with the PIARC position on data collection as set out in this report.
- Whilst the EU Directive cannot be ignored, it should not be central to the whole document.
- The national experiences were very interesting.
- No countries yet have an inspection entity.
- The English needs to be improved.
- Different writing styles are discernible.
- There are no conclusions or recommendations.
- Whilst the report adds value, it is not yet ready for approval.

E NORSTRØM felt that an emergency exercise every year was too frequent and that advice on maintenance documentation would be helpful.

D LACROIX concluded that the committee was not able to approve this report which needed further development with more reviewers. The peer reviewers had been identified as J Gillard (UK) and F HEIMBECHER (Germany).

All C3.3 reviewers should complete and submit their reviews by the end of April.

7.1.5 Lay-bys and SOS stations

U WELTE gave a brief outline of the report. The reviewers were identified as B FALCONNAT, A JEANNERET, S MOOSAVI-ESHKEVARI, A MARINKO and W DE LATHAUWER. B FALCONNAT provided his comments (see attachment 24) following consultation with M ROMANA:

- As safety routes had been removed from the scope, a new Fig 1.1 would be appropriate.
- The proposed PIARC position on lay-bys is not clear. The report should at least set out the rationale for making a decision.
- Recommendations regarding colour should be made clear (4.2.2 Signage)

M ROMANA raised the question of terminology. Should they be “SOS” or “Emergency” stations? A WEST advised that in the UK they were called emergency points. It was agreed that

they should be called emergency station, in line with the EU Directive and that other terms should be clarified in the introduction.

A JEANNERET queried whether the guidance referred to uni-directional or bi-directional tunnels. In Switzerland lay-bys are only required in bi-directional tunnels. The choice of pictures to demonstrate the different types of emergency point could be improved. The differences are not always apparent with the examples shown (e.g. Figs 2.2 and 2.3). With regard to the colour of signs there are already requirements set out in the Vienna Convention and by the UN ECE. The report should strive to provide clear direction with regard to this. Finally, the word “should exceed 1000m” (Section 4.1.2) needs to be explained.

A WEST pointed out that the references to hose lengths and hydrant spacing (section 3.2) were incorrect. In the UK hose reels should not exceed 30m and hydrants are at alternate emergency stations. It may be preferable to delete references to fire suppression equipment from the document as they are outside the scope. He also asked if some technical information might be provided about the telephones which might be used.

B BLASZCZAK indicated that he could provide data about lay-by usage. It was also noted that data on vehicle breakdowns in tunnels had been provided in a 1995 PIARC report. E NORSTRØM added that lay-bys are located opposite to vehicle turning bays in Norway. As J ROHENA pointed out, they could be dangerous if used illegally as turning points. W LIU advised that lay-bys were considered on a project specific basis.

D LACROIX stated that Section 1.2 on safety management should be made consistent with other C3.3 reports (those of WG2 mainly) or deleted. The classifications of emergency points are set out differently at two places in the report. He preferred those of Section 3.2. Many countries do not accept that emergency stations should be accessible to disabled travellers. In Sections 3.1 and 3.2, the details of lay-bys and emergency stations are muddled. The issue of consistent colours for tunnel equipment (Section 4.2.2 d) has been discussed at length by WG’s 3 and 4. It would be best if this was dropped from the report and be dealt with in the joint WG3-WG4 report only. The conclusions must reflect a positive approach.

D LACROIX concluded that there were many comments which needed to be addressed. The report should be resubmitted for approval at the next meeting. There will be no peer review before the next meeting.

7.1.6 Guide to optimising the air quality impact upon the environment

A BENDELIUS gave a brief overview of the report (see attachment 25). The reviewers were identified as J EMERY, L SAJTAR, H TAKANO, H BUVIK and I del REY. I del REY presented his comments (see attachment 26):

- The Australian bias of the previous draft had been addressed.
- It was now a well balanced document.
- There was much more on dispersion model methodologies.
- The Conclusions and Lessons Learnt sections tended to duplicate one another in some areas.
- The English could be complex for foreign readers.
- The report is structured satisfactorily.

Thus, the report meets its objectives and if the above comments are addressed then the report should be approved.

A BENDELIUS agreed to make the above changes. On this basis the report was approved. Arrangements are in place for the document to be translated within 1 month of the document being delivered.

7.1.7 Impact of pavement on fires

A BENDELIUS gave a brief introduction (see attachment 27) before handing over to W DE LATHAUWER who said that he had added the Dutch comments but had not received the French test results from last autumn, pending authorisation from those who had ordered them. D LACROIX said that these should be available and that he would find out more.

M ROMANA presented his comments on the document (see attachment 28):

- The title had changed from impact to effect.
- This was not an important issue but more politically motivated.
- It was not a report in its own right, but could be an article in Routes / Roads or added to another report.
- It was a very good note describing the PIARC position, which had not changed, with some questions still remaining unanswered.

B FALCONNAT commented that it should perhaps be added that the road surface had only a small impact on the M Blanc fire. He noted that other PIARC documents described an allowance being made in the tunnel section to accommodate re-surfacing which implied acceptance of asphalt surfaces. Finally, it is not convenient to change the road surface as you pass from surface to tunnelled roadways.

These reviewers felt that the note should be approved with the remaining questions answered. If the technical note was approved then a Routes / Roads article could be developed from it.

D LACROIX urged caution with the manner in which the M Blanc fire was reported. The amount of asphalt burnt was significant but did not make a significant impact on the final outcome of the fire. The French test results must be consulted. W DE LATHAUWER queried the suggestion that asphalt provided 20% of the M Blanc fire load. D LACROIX agreed to forward copies of the pertinent reports.

A BENDELIUS saw no problem in producing an article for Routes/Roads in 2 languages for the next meeting.

7.2 Information and discussion on first drafts or technical issues submitted by WGs

7.2.1 Human factors and tunnel safety

E WORM gave an overview of the report (see attachment 29). He hoped the committee could give guidance on the report structure, links between sections and balance. The reviewers for this report were identified as P PRIBYL, G ZIAKAS, G GRESCHIK, J ROHENA and W DE LATHAUWER. W DE LATHAUWER presented his comments:

- Chapter 2 was very interesting but would be better with more references to tunnels.
- There were 20 pages of text to 50 pages of recommendations. This appears unbalanced and should be improved with restructuring.
- There is repeated reference to the EU Directive. Is this a good way forward?
- This remark also applies to the Vienna convention.
- The weather problems are possibly exaggerated.
- Recommendations sometimes conflict with current PIARC position (e.g. should drivers leave or remain with their vehicles).
- Lay-bys are considered of little value. What do the authors of “Lay-bys and “SOS” stations think about this?

D LACROIX also felt that the balance of the report needed to be changed. E WORM thought he might be able to re-group the sections to this end. D LACROIX requested that other references

(e.g. NFPA 502) be quoted to remove the EU Directive from the focal point of the report. It was suggested that the authors of the report might take into account the reports available from the FIT site where the various national standards are compared.

U WELTE agreed to take the text to WG4 to discuss the comments on lay-bys. He suggested that there might be scope for providing a cross reference between the two documents.

D LACROIX requested that all reviewers send their comments by the end of April.

7.2.2 Video detection: benefits and limits

This was discussed earlier as part of the WG 4 progress report (see Item 4.4 above).

The reviewers were identified as H KEYMEULEN, P PRIBYL, J THOMSEN, J KRIEGER, T MIZUTANI, R HAUG, A DEBS, O NISKANEN and S MOOSAVI-ESHKEVARI

This was discussed earlier as part of the WG 4 progress report (see Item 4.4 above).

7.2.3 Operation strategies for tunnel ventilation

A BENDELIUS gave a brief overview of the report (see attachment 30). He indicated that he would welcome guidance on the direction and content of this report. The reviewers were identified as H KEYMEULEN, B FALCONNAT, G ZIAKAS, A FOCARACCI, W LIU, S PETELIN, A DEBS and S MOOSAVI-ESHKEVARI. No comments had been received to date. They should be sent no later than the 3rd week in April. All reviewers are to be e-mailed to encourage them to send their comments.

U WELTE noted similarities to the Incident Detection report (Section 2.6). A BENDELIUS clarified that this report was addressing the response and not detection. The wording would be changed if this was a problem.

J ROHENA wondered if the report would consider means of confirming that ventilation systems were actually doing what was required. A BENDELIUS considered this a design / commissioning issue rather than operational.

A JEANNERET was concerned that the report was discussing semi-transverse system in which the fans are reversed for smoke control in an emergency. Fan reversal times can be unacceptably long.

D LACROIX and A BENDELIUS agreed that this was a difficult report to produce as clear recommendations are hard to identify.

7.2.4 Assessment of fixed fire systems

A BENDELIUS gave a brief overview of this report (see attachment 31). The reviewers were identified as A WEST, G ZIAKAS, M GHAROUNI-NIK, S PETELIN, F TARADA, O NISKANEN and H TAKANO. Six sets of comments on the previous draft had been received to date plus those of D LACROIX. This latest draft should be commented upon by the 3rd week in April.

Table 5.1 grades the performance of detection systems. U WELTE had difficulty with the grades given to linear heat detection and stand still detection.

E WORM felt some attention must be given to the costs. A JEANNERET believed there should be some reference to the use of risk analysis in determining the benefit of fire suppression systems and that this should be mentioned in the conclusions. A WEST agreed and felt that justification for the installation of suppression systems should, ideally, be based upon risk / cost analysis. To date, it had been difficult to justify it on this basis, which should also be stated.

In Section 4, it is suggested that “a performance based standard is produced”. J KRIEGER did not understand why this had not been done as part of the system specification. A JEANNERET pointed out that it was during an incident and it was agreed that the text should be revised to make it clearer.

8 DATE AND VENUES OF NEXT MEETINGS

8.1 China.

The next meeting in Chongqing, China will take place 16/17 October 2006 (see Item 5 above). P SCHMITZ will generate an attendance list, as for San Juan. For those who need it for attendance, an official invitation will be required by July at the latest. A draft general programme of the meeting and seminar will also be required by this time. The technical agenda will be finalised in early September.

8.2 Japan

T MIZUTANI extended an invitation (see attachment 32) for the committee to meet in Tokyo, Japan in May 2007. He proposed that the arrangements be similar to those in Australia; a 2 day technical meeting to be followed by a 2 day workshop and 1 day site visit. The site visit would be to the Trans Tokyo Bay Tunnel and Shinjuku tunnel.

There was lengthy discussion about the preferred dates. It was eventually agreed that there was a preference for the week commencing 4 June. If this was not possible then consideration would be given for the week commencing 21 May. It was asked whether the meeting could be held in Kyoto with the workshop in Tokyo.

Ideas for workshop topics included the EU Directive and related activities in EU countries, fire suppression, air cleaning, management of heavily trafficked tunnels, Japanese standards (A BENDELIUS agreed to circulate an English translation of the current standards) and self rescue systems.

T MIZUTANI agreed to investigate and report back on the timing of the meeting, venue and workshop topics.

9 ANY OTHER BUSINESS

9.1 US activities to improve tunnel safety and scanning tour

J ROHENA gave an abridged version of his presentation (see attachment 33) on lessons learnt by a USA delegation to various European countries in 2005.

9.2 Full scale testing facility in Spain

I del REY gave a short presentation (see attachment 34) on the new Tunnel Safety Testing facility opened in Spain. He distributed leaflet showing the key features.

10 CLOSE

D LACROIX thanked everyone for attending the meeting and looked forward to seeing them in Chongqing. He thanked J MARCET for the excellent organisation and hosting of the meeting.

A West
(English speaking secretary)

P Schmitz
(French speaking secretary)

M Romana-Ruiz
(Spanish speaking secretary)

List of attachments

These attachments are accessible on the C3.3 private Website

1. 1.4. PIARC letter - Participation in the work of technical committees: En/Fr (*A West*)
2. 3.1.1 SafeT - New web site flyer (*P Schmitz*)
3. 3.1.2 UPTUN - Progress report (*E Worm*)
4. 3.13. EuroTAP - Presentation on seminar (*P Schmitz*)
5. 4.1. Progress report WG1 (*J-CI Martin*)
6. 4.2. Progress report WG2 (*R Hörhan*)
7. 4.3. Progress report WG3 (*E Worm*)
8. 4.4. Progress report WG4 (*U Welte*)
9. 4.4. Presentation on "Video detection: benefits and limits (*U Welte*)
10. 4.5. Progress report WG6 (*A Bendelius*)
11. 5.0. Chongqing seminar (*W Liu*)
12. 5.0. Leaflet Chongqing (*W Liu*)
13. 5.0. Draft agenda Chongqing (*W Liu*)
14. 6.2. Preparation for 2008-2011 Strategic plan (*A West*)
15. 6.5. E-mail report translation (*A West*)
16. 6.6. PIARC note articles Routes/Roads : En Fr (*D Lacroix*)
17. 7.1.1 Introduction to "Guide to organising, recruiting and training road tunnel operating staff" (*J-CI Martin*)
18. 7.1.1 Comments on "Guide to organising, recruiting and training road tunnel operating staff" (*B Falconnat*)
19. 7.1.2 Introduction to Integrated approach to tunnel safety (*R. Hörhan*)
20. 7.1.2 Comments on Integrated approach to tunnel safety (*E Norstrøm*)
21. 7.1.3 Introduction to Risk analysis for road tunnels (*R. Hörhan*)
22. 7.1.4 Introduction to Tools for road tunnel safety (*R. Hörhan*)
23. 7.1.4 Comments on Tools for road tunnel safety (*A Pinto da Cunha*)
24. 7.1.5 Comments on Lay-bys and SOS stations (*B Falconnat*)
25. 7.1.6 Introduction to Guide to optimising the air quality impact upon the environment (*A Bendelius*)
26. 7.1.6 Comments on Guide to optimising the air quality impact upon the environment (*I del Rey*)
27. 7.1.7 Introduction on Impact of pavement on fires (*A Bendelius*)
28. 7.1.7 Comments on Impact of pavement on fires (*M Romana*)
29. 7.2.1 Introduction to Human factors and tunnel safety (*E Worm*)
30. 7.2.3 Introduction to Operation strategies for tunnel ventilation (*A Bendelius*)
31. 7.2.4 Introduction to Assessment of fixed fire systems (*A Bendelius*)
32. 8.2. Invitation to Japan (*T Mizutani*)
33. 9.1. Presentation on US delegation visit to Europe (37 Mb) (*J Rohena*)
34. 9.2. Presentation on Tunnel Safety Testing facility in Spain (*I del Rey*)