

C 3.3 ROAD TUNNELS OPERATION

The 23rd World Road Congress has marked the 50th anniversary of the PIARC Technical Committee on “Road Tunnels” (as it was initially named).

Since the Committee’s creation in 1957, more and more tunnels have been built to cross natural barriers or urban areas. Existing tunnels are carrying increasing traffic and a number of them nowadays need refurbishment. In all cases, effective equipment as well as efficient and safe operations are needed. For 50 years, the PIARC Committee on “Road Tunnels Operation” (as it is currently named) has been engaged in the consideration of issues relating to road tunnels operation.

During the 2004-2007 cycle, 5 reports from the preceding cycle have been finalised and published and 11 new reports have been prepared. The presentations and the discussions during the Committee session at the Congress addressed the various areas covered by these reports. They led to the following conclusions, which were complemented the following day at the special session on “Management of Safety in Road Tunnels”.

Recommendations to Decision makers

Whilst tunnel designers and operators can, and are, making every effort to improve the safety of tunnels, the eventual success of their labour will depend greatly upon the ability of the users to respond sensibly in an emergency. The work on human behaviour in tunnels has identified this issue and concluded that this can only be achieved through the dissemination of information, via a whole range of media and appropriate training and exercising. This should be planned and closely managed.

In the wake of tunnel incidents, it is easy to over-react and implement safety “improvements” which are costly and do not significantly improve safety. Efforts are being made to provide the means of making these decisions in a more thoughtful and defensible manner. This involves techniques such as “risk analysis”. This has been reported upon during this cycle but further work needs to be done. Decision makers should support these efforts and help the general public understand and accept the approach.

Technical aspects

Guides have now been produced addressing good management practices and the recruiting and training of appropriate staff. These two guides should now be drawn together with the development of procedures to generally improve tunnel operation based on feedback from operation, training and exercising, but also improved inspection and maintenance organisation.

Whilst much has been achieved over the last cycle, it still remains for some guidance to be provided with regard to responsibilities in tunnel safety management. With responsibilities defined, there should be clarity of the organisational structure and the competency requirements of these roles.

Tunnel systems must be continually reviewed to identify where their performance might be influenced by changing conditions, or better understood as a result of newly available research.

The composition of the vehicle “car park” and the impact of vehicle engine standards continue to change. These changes impact upon the performance of existing ventilation systems and the design of new ones. These need to be continually reviewed.

Similarly, over recent years the results of fire tests have become available which could impact significantly upon what is considered a sensible fire size to be adopted for design purposes. These need to be investigated and their possible impact assessed.

Considerable work has been carried out with regard to fixed fire fighting systems (FFFS) over the last cycle. Whilst new recommendations have been made, there continues to be further developments and operating experience. Close monitoring of this system should be maintained.

Recommendations to PIARC

The potential benefits of video image processing technology are now being investigated as a powerful tool for tunnel operators to detect incidents and take appropriate actions. At that point, real-time communication to inform users of appropriate behaviour is still the weak element of the tunnel safety system. PIARC needs to work with the technical committees and possibly outside organisations to ensure the finalisation and harmonisation of in-tunnel communication means (including radio broadcasting, permanent and variable visual aids, audio aids, etc.) so that tunnel users know what is happening in the tunnel and what they should do.

The “Road Tunnels” committee has produced many reports over the years. These inevitably overlap in some areas and require updating from time to time. This situation can lead, on occasion, to difficulties in interpreting the exact position of PIARC on some issues. There was considerable discussion at the session regarding the possibility of producing information in the future in a structured manner to overcome these difficulties. Various options were mentioned. It was concluded that this was a knowledge management issue. These issues should be discussed within PIARC to see if a modified approach might be more appropriate.