

Strategic Theme D: Infrastructure

Goal

The goal of Strategic Theme D is to improve the quality and efficiency of road infrastructure through the effective management of assets in accordance with user expectations and government requirements.

Overview

The purpose of the TC D5 meeting in Florence was to finalise the reports of each Work Group for the cycle and to make preparations for our work at the World Road Congress in October 2019. Our Technical Committee also conducted an international conference on “Temporary Alternative measures for Road Tunnel Safety” in Rome on 29 March 2019.

26 March 2019

Mr Marc Tesson (Chair of TC D5) opened the meeting which was held at the Ministry of Transport and Public Works office in Florence.

TC D5 currently has 150 members of which approximately 60 are full members.

Work Group Reports

Work Group 1 – Sustainable Operations

LED Technology Watch has been completed.

The main report is titled “Applying the RAMS approach to road tunnel operations”. It has been approved by the Theme Co-Ordinator. Publication of the report is expected to occur within the next few weeks.

The Work Group has also made significant contributions to the upgrade of the Road Tunnels Manual.

Work Group 2 – Safety

Report on “Prevention or Mitigation of Tunnel Related Collisions” was published recently. Translation of the report into French and Spanish is planned to occur by end 2019. The report has already attracted many favorable comments and it will be presented at three international conferences prior to the World Road Congress.

PIARC owns and distributes the software for DG-RAM. The platform needs to be upgraded and improvements need to be made to its functionality.

The current version of DG-QRAM runs on Excel 2003 and is outdated. The upgrade project will allow DG-QRAM to run on modern platforms. This upgrade was completed recently and is available for sale. Cost is approximately, €1,000 – €1,500. Training sessions will be conducted for new users and separately for experienced users. The training is intended to take place only in Paris commencing in June 2019. I enquired about making training available at other locations and this is now being considered.

Funding is being sought to improve the functionality of DG-QRAM. Some funding has been confirmed by various countries enabling commencement of work on improving the functionality. A leaflet on DG-QRAM is available and will be used in the process of promoting the upgraded DG-QRAM version.

Significant contributions have been made to upgrade the Road Tunnels Manual.

Work Group 3 – Human Factors and ITS

- Preparation of main report on meeting the needs of people with reduced mobility when using road tunnels is nearing completion. A report on public address systems in tunnels has been published and will be included as an appendix to the main report.
- Preparation of a Technical Watch report on the use of ITS in tunnels is underway and aiming to finalise a report by mid- 2019. The report will focus on key challenges associated with ITS applications rather than details of ITS developments.

Work Group 4 – Vehicle Emissions

- The main technical report on ventilation and emissions is complete and has been published. Its title is “Vehicle Emissions and Air Demand for Ventilation”.
- A Technical Watch report on vehicles powered by alternative fuels and impacts on tunnel safety is being prepared and is expected to be finalised by mid- 2019. The report is mainly about asset protection.

Work Group 5 – Large Underground Infrastructure

- Due to low participation by Work Group members, case studies prepared in the previous cycle will not be updated.
- Reasonable progress with a report on tunnel ventilation and a chapter on tunnel signage is being prepared.
- Complex underground infrastructure is a significant emerging issue and requires committed people to develop a report on best practice underground infrastructure. This will be a priority in the next PIARC cycle.

Work Group 6 – Knowledge Management

This Work Group is continuing to arrange preparation of new pages, review of existing pages and progressive publishing of reviewed pages in the back office. Upgrading the manual is proving to be more challenging than first envisaged. Aiming to have the updated Road Tunnels Manual published in English by February 2020 with some hope of completing it by the next World Road Congress in Abu Dhabi in October 2019. Training modules associated with various topics in the manual will be prepared in the next cycle.

Following the road tunnels conference in Lyon in October 2018, the number of people accessing the manual increased significantly.

Some committee members have been using Deep L Pro for automatic translation. Apparently, with greater use and interaction with Deep L Pro it learns and gradually improves the quality of translation.

27 March 2019

The Committee was updated on liaison with other organisations.

ITA – COSUF (Committee on Operational Safety of Underground Facilities)

COSUF workshop on New Energy Carriers held in February 2019.

It will run a workshop in May 2019 on operational safety, tunnel ventilation and reducing monotonous driving in long tunnels. A paper on new energy vehicles will be presented at this workshop.

It will also prepare a report on cross passages in tunnels (road and rail) during 2019. A sub-committee comprising of emergency services representatives is planned to be formed.

CIE (International Commission on Illumination)

It is working on lighting in short tunnels.

CENELEC

Developing a new European standard for measuring devices for air quality in tunnels. Currently examining the maintenance frequency for various devices. Testing of devices will be undertaken in operating tunnels.

AASHTO (American Association of State Highway and Transportation Officials)

US Domestic Scan Program on tunnels conducted about two years ago and the scan reports are accessible. Specifications for tunnel design and construction have been developed. It has 20 committees that meet twice a year and they have undertaken many research projects.

World Road Congress: 6–10 October 2019

A Technical Session is to be conducted by TC D5 on 9 October with a duration of a half day.

We developed the following draft Agenda for our Technical Session.

1. Introduction (this will provide an overview of our work during the current cycle)
2. A presentation by each Work Group on its main outputs
3. Brief presentation on papers received by the Committee
4. Proposed topics for the next cycle

A Poster session will be held on 10 October.

Our TC will meet in Abu Dhabi just prior to the World Road Congress to complete the remaining outputs and to commence arrangements for the next cycle.

Terms of Reference for the next cycle, participants and technical committee chairs will be confirmed before the next World Road Congress. Candidates for technical committees are to be nominated by their country's first delegates.

Key Learnings

- Germany is considered to be a leader in assessing cyber security of tunnel control centres. In Germany a single control centre may manage up to 50 tunnels. Approximately 60% of tunnel control centres in Germany have experienced cyber-attacks. It undertakes penetration testing to identify weaknesses in the system that need to be addressed in order to reduce risks. Guidelines and tools have been developed.

In Germany, maintenance of tunnel control systems is contracted out and so protection systems need to be set up to manage the risk of contractors being able to take control of tunnel systems without authorisation. A connection to the World Wide Web creates a risk of unauthorised access. Systems should be devised to be isolated and accessible only by the asset owner and its authorised people.
- In Sweden, a bus fitted with a gas tank on its roof failed to clear a height gauge on approach to a tunnel and on colliding with the height gauge it exploded. From discussion about this incident it is clear that prevention of over height vehicles from entering tunnels is a common problem. This would be a worthwhile topic to consider in the next cycle.

28 March 2019

Our TC visited the control centre and ventilation building of the main tunnel of Variante di Valico along the A1 highway.

29 March 2019

Our TC conducted an international conference on “Temporary Alternative Measures for Road Tunnel Safety” in Rome. It was attended by approximately 150 people in the conference room and several hundred people joined by WebEx.

The conference was focused on the EU Directives for road safety (which includes tunnels) and how various countries were progressing with achieving requirements by the deadline of April 2019. Some countries will be seeking an extension of time to implement their safety initiatives, but they must demonstrate a strong case and also indicate what interim measures they will implement.

I gave a presentation on Australia’s approach to achieving safety in tunnel operations with a strong emphasis on our Safe System approach which is also adopted in New Zealand.

George Mavroyeni
Technical Director, Independent Reviewer
AECOM Australia Pty Ltd
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