16th IRF (International Road Federation) World Meeting

Current action of ASECAP members to improve road safety in tunnels

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AGENDA

TUNNELS & ASECAP MEMBERS

SOME BEST PRACTICE ON TUNNELS FROM ASECAP MEMBERS (Infrastructure – Operation - Planning)

CURRENT ISSUES
Number of tunnels > 500m in 2010 (source EC 2001)

- Italy
- Austria
- Germany
- Greece
- France
- Spain
- Portugal
- Ireland
TUNNELS & ASECAP MEMBERS

SOME BEST PRACTICE ON TUNNELS FROM ASECAP MEMBERS (Infrastructure – Operation - Planning)

CURRENT ISSUES
2 voies montantes

Barrière pleine voie de La Turbie PR 208

Antenne de Monaco PR 207

Futur 1/2 diffuseur de Laghet

Vue du tunnel (détail)

L'environnement du tunnel A500

Nice

Vallon du Laghet

Antenne de Monaco PR 207

Futur 1/2 diffuseur de Laghet

Vue du tunnel (détail)

2 voies montantes

Barrière pleine voie de La Turbie PR 208

Cime de la Forna

1 voie descendante

Parc Forestier Départemental de la grande corniche

L'enviornement du tunnel A500

A8

A500

Les Serriers

Les Costes

Monaco

N7

Italie
Building of 3 new pressurized safety shelter: final design
Safety shelter - 50m²
Capacity: 100 people

- Safety shelter
- Emergency telephone
- Fresh air fan
- Extinguisher
- Lighting
- Video camera
- Laudspeaker
- Safety cabinets:
  - Survival blankets
  - Water bottles
  - First Aid Kit
For compliance with the European Directive several tools were developed. For instance a tunnel accident database is in operation since January 2006.
Gran San Bernardo Tunnel

1. Ventilation Upgrade to a state of the art concept of operation

2. Designed and contracted a service and emergency tunnel
CURRENT SITUATION

Equipment operation scheme

Fans ON
Full section damper
Open exhaust dampers
Fans OFF

Fresh air
Smoke
CONSTRUCTION OF THE DAMPER
23 CROSS-CONNECTIONS
(one every 240 meters completed with filter rooms)
SAV cooperated with Aosta Valley Authorities for setting a service tunnel of the Aosta Ring Road (side facility of "Cote de Sorreley" tunnel) to be used as a permanent test-field for joint exercises. Through this activity there was an intense cooperation resulting in a self-evident preliminary knowledge of phenomena and procedures.
Frejus Fire Simulator
(developed by SITAF-SFTRF)

T4 - Frejus Motorway Tunnel

Inside fire simulator

Control panel
Article 1  Subject matter and scope
Article 2  Definitions
Article 3  Safety Measures
Article 4  Administrative Authority
Article 5  Tunnel Manager
Article 6  Safety Officer
Article 7  Inspection Entity
Article 8  Notification of the Administrative Authority
Article 9  Tunnels whose design has not yet been approved
Article 10 Tunnels whose design has been approved but which are not yet open
Article 11 Tunnels already in operation
Article 12 Periodic inspections
Article 13 Risk analysis
Article 14 Derogation for innovative techniques
Article 15 Reporting
Article 16 Adaptation to technical progress
Article 17 Committee procedure
Article 18 Transposition
Article 19 Entry into force

EU Directive 54/04 Implementation

- 18 Tunnels
- 13 km

Legenda
- Undefined
- In process/partly done
- Done
Tunnel safety: 6 years experience of the Directive
Situation for the French motorway operators:

- 42 tunnels concerned: a total of 90 km
- Safety audit: made 100%
- Total estimated cost: 900M€
- Percentage of achievement: 80%
The experience of ESCOTA shows that it is possible to refurbish tunnels without interrupting traffic flows.

Keeping operational one lanes over 2 tubes at nighttime and allowing traffic over 2 tubes x 2 full lanes during daytime appears feasible.

The organization to be set up is a very complex and expensive one: contracts for works need to be performed being “pessimistic” about the number of nights a year where the work will be authorized by the operator.
Currently, 140 Tunnel facilities are operated with a total length of about 324 km from ASFINAG. Because of this high proportion of tunnel on all routes, ensuring a maximum level of safety and efficiency in tunnel is a key goal for ASFiNAG. Directive is applied on all motorways, not only in TERN. According the experience of ASFINAG, tunnel safety could be greatly improved thank to technological developments and organizational measures in the event of an incident or accident. ASFINAG annually invests about € 200 million in the construction and rehabilitation of tunnels. In line with the Directive timeframe.
An important portion of the National territory is covered by the mountainous chains (Alps and Apennines). That introduce the obvious complexities and criticalities in the use of the territory and in the construction of the road networks.
It is interesting to observe that a very important share of the European TERN Tunnels is located in Italy and Austria...
... and that an important share of the tunnels in the National Network are located in specific regions (e.g. Liguria)
17% of the tunnels of the European Network is located in Liguria.
Liguria is maybe the harder one but not the only case

High concentration in works (traffic and safety)

Higher costs in charge of specific operators
What about safety?

Statistics generally shows that tunnels appear safer.
The reduced accident rate in tunnels is essentially due to factors like:

- an higher level of attention of drivers
- the pavement in tunnels is usually dry
- fog-free
- free from ice or snow
- a continuous artificial lighting
Thanks for your attention