Is an ITS Simulation Platform really Necessary?

Road and Maritime Traffic Department
Joaquín Ponz – Interurban and Tunnel Area Manager
Is an ITS Simulation Platform really necessary?

In which measure a Simulation Platform is needed?
Could you assure the qualification of your staff in front any traffic eventuality?
Is an ITS Simulation Platform really necessary?

Index

01 Scenario Description AP-1

02 Life Cycle and Platform Actors

03 Architecture and Processes

04 Others Simulation Platforms

05 Conclusions
Scenario Description: AP-1

- The whole project has been executed in 7 years in different phases, with out affect to the exploitation of the tunnels in operation.

- **Phases**
  - Eibar - Bergara Norte: December 2.003
  - Bergara Norte - Bergara Sur: July 2.004
  - Bergara Sur - Arrasate: July 2.005
  - Eskoriatza – Iuskitza: April 2.009
  - Iuskitza – Vitoria: April 2.009
  - Arrasate – Eskoriatza: May 2.009

- **TUNNEL**
  - Elitz: 740 m
  - Gallaztegi: 2.400 m
  - Lezarrri: 1.250 m
  - San Martzial: 1.450 m
  - Artitzi: 310 m
  - Ikastuaun: 1.175 m
  - Gurutzetxiki: 710 m
  - Izurieta: 280 m
  - Apztzaga: 320 m
  - Zamarin: 480 m
  - Iuskitza: 3.407 m
  - Luko: 620 m

- **Highway Length = 46 Km**
- **Tunnels Managed by the Control Centre = 12 main tunnel & 4 Access**
- **Total Km Tunnel (both directions) = 27 Km**

- **1 Main Control Centre & 1 Sub centre**
- **7 Vehicle Cross Passages**
- **20 Pedestrian Cross Passage**
- **324 CCTV cameras**
- **572 Signalling Equipment**
- **988 Public Address Devices**
- **184 Fans**
- **456 Sensors (Opacimeters, CO detectors, Nox, anemometers…)**
- **252 (Internal Emergency Telephones and 48 Externals)**
- **48 Traffic Counting Units**
- **20 Traffic & SCADA Control Remote Units**
- **24 Communication Nodes**
- AID, Fire Detection, Radio broadcast...
• Higher Availability of the Installations...
• Higher Reliability over the operation.
• Availability to create procedure to assure the security.
• Better quality of service.

• Higher control, during the project life cycle.
• More Evaluation Tools.
• More consensus in the solutions.
• Validation processes anticipation.

• Better professionalism in operation.
• Less impact in the opening.
• Better software and configuration control version.
• Less road intrusion during Tests, Training...

Is an ITS Simulation Platform really necessary?

AP-1 Actors : Benefits of a Simulation Platform
Is an ITS Simulation Platform really necessary?

Simulation Platform Life Cycle

Indra Installation

- Design (HMI)
- Logic
- Performance
- Reliability
- Algorithm
- Operation

Constructive

FAT

Zarautz Installation

- Algorithm
- Training
- Incidents
- Evacuation
- Maintenance

Commissioning

SAT

- Continuous Training
- Better Processes Management
- Traffic Management Plan Updating

Operation

www.irf2010.com
Simulation Platform Architecture at Provider Installations

Is an ITS Simulation Platform really necessary?

HORUS
HORUS-TS
Is an ITS Simulation Platform really necessary?

Simulation Platform Architecture at Control Centre
Is an ITS Simulation Platform really necessary?

Process I: Algorithm and Equipment Simulation

www.irf2010.com
Is an ITS Simulation Platform really necessary?

Process II: Incident Management Simulation

FICHA DE CONSIGNAS DE OPERADOR
CÓDIGO: 4006
INCENDIO

Constructive  Commissioning  Operation

www.irf2010.com
Is an ITS Simulation Platform really necessary?

Process III: Maintenance Management Simulation
Is an ITS Simulation Platform really necessary?

Other Simulation Platforms

www.irf2010.com
Is an ITS Simulation Platform really necessary?

Why not? ..... The future

The present....
Current Regulations & Recommendations

- CETU.
- RABT.
- IOS-98.
- NFPA 502.
- PIARC.
- Circulaire Interministerial Francesa
- ADAC: European Tunnel test 2001, April 26, 2001
- DIRECTIVA 2004_54_CE
- ...

How many of them talk about the qualification and certification of the operators?

- UPTUN (European Research Program on Upgrading) “Report Task 3.3 Tunnel Operator”.
- PIARC TECHNICAL COMMITTEE ROAD TUNNELS “Guide for Organizing, Recruiting and Training Road Tunnel Operation Staff”, committee C3.3 Road Tunnels operation.
Advantage and Disadvantage of the appropriate level of knowledge of the operators

<table>
<thead>
<tr>
<th>Knowledge level (technical)</th>
<th>Avantage(s)</th>
<th>Disadvantage(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>More resistant to tedious and low level activity</td>
<td>Training can be long. Likely to need technical training. Some possible difficulties to understand how equipment works and anticipate consequences of actions.</td>
</tr>
<tr>
<td>Medium (Reference level)</td>
<td>Good level to manage existing equipment Training not too long.</td>
<td>May need a decisive leader (in case of major incident).</td>
</tr>
<tr>
<td>High</td>
<td>Training very quick. Very good level of manage existing equipment and to understand and anticipate physical consequences of actions.</td>
<td>The job can rapidly become monotonous. Risk of high turnover.</td>
</tr>
</tbody>
</table>

…. In all cases the training course must be of sufficient duration and be progressed under permanent supervision followed by a final validation. Another possible way to train operating staff is by the use of a simulator. Initially, the candidate should read and assimilate the “operators manual” and the necessary parts of “functional analysis of the system”. After this, he/she passes one week (or more) at a simulator becoming proficient with the controls but not operating any real system.
In which measure do you think that a Simulation Platform is needed?

Which are your Resources?