Greater security in the subways

Eurekalert!

Tecnalia is participating in the SECUREMETRO project which is aimed at the development and investigation of protective systems for metro vehicles that can enable us to travel with a greater level of safety in the case of a disastrous event.

The terrorist attacks on commuter trains in Madrid in 2004, and the following year, on the London underground, have highlighted the vulnerability of passengers to attacks, particularly in a means of transport where it is difficult to implement the types of security controls used to detect explosives currently in operation at airports.

After those attacks the SecureMetro project was launched through the European Union FP7 funding programme and with the aim to develop validated materials selection and design strategies for improved safety on metros and railways. The project partners come from four EU countries – France, Italy, Spain and United Kingdom. After three years of work, the researchers and companies in the United Kingdom (Newrail), Spain (Tecnalia, Metro de Madrid, Maxam-Expal, FFE, Sunsundegui), France (RATP, IFSTTAR, Bombardier) and Italy (STAM, IAI) involved in this project have developed a demonstrator train carriage which includes materials and protection systems that are more resilient to an explosion and which can help to reduce the effect of the shock wave and the number of secondary fragments generated during an attack.

Tecnalia has been responsible for leading the SECUREMETRO testing program and has worked with a combination of commercial material solutions which have been selected for study and experimentation from a wide number of markets including military, security, aeronautics and construction. Additionally Tecnalia's own material developments have been included for assessment as in the case of high performance ceramics originally developed by Tecnalia for both personnel and aircraft armor applications.

In the analysis of materials, Tecnalia has focused part of its activity on the protection of windows. The majority of the vehicle windows were made of laminated glass (with the exception of the standard emergency exits). Several of these were additionally protected with polymeric films and adhesive layers to minimize the risk of complete separation of the window from the vehicle and thereby reducing the number of glass fragments thrown outwards during an explosion.

Tecnalia also had the responsibility of installing and controlling a network of pressure sensors and cameras for the monitoring of 16 explosive tests which included over 50 material test panels specially selected and fabricated by the consortium partners. Tecnalia was also responsible for installing and running the monitoring network for the demonstrator train carriage test, which was used to study the effects of the explosions in more detail. As well as the pressure sensors,

several high speed cameras have been used in and around the vehicle to provide detailed visual information of the test.

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