

INTERNATIONAL WORK SHOP ON RC FRP SEISMIC RETROFITTING, Chair Emmanuel FERRIER, University Claude Bernard LYON 1, 19-20 September 2016



In various countries, including France, the regulations concerning buildings and civil engineering structures contain recommendations aimed at achieving acceptable seismic performance, that is, the structures designed must withstand minor earthquakes without damage, moderate earthquakes with minimum non-structural damage and major earthquakes without collapsing. The seismic recommendations proposed in building regulations have thus been updated over the years to achieve this aim. In France, the new earthquake zone map and changes in the regulations as a result of Eurocode 8 (EC 8) have contributed to defining the performance objectives of new structures. For existing structures, at least in certain cases, reinforcement is required to reduce seismic risks. This notion is introduced in Eurocode 8 Part 3 and in the implementing decrees and orders. Seismic retrofitting can therefore be either voluntary

or compulsory. FRPs are therefore being increasingly used in civil engineering applications, particularly for the repair and reinforcement of reinforced concrete structures. They are used for reinforcement in flexural strength and shear and with respect to axial loads. They allow them to increase strength and/or ductility of the structures. In the United States, research on seismic retrofitting using composites began with the Loma Prieta earthquake in California in October 1989.



Reinforcement tests using pre-impregnated fabrics, based on the Japanese methods, were carried out in numerous universities particularly the University of California. Starting in 1994, seismic tests conducted in the laboratory on increasingly large mock-ups, demonstrated the advantage of using carbon fibres. These were followed by numerous retrofitting operations using composites, including the Highway Bridge in Butler (Ohio), the Great Western Bank Building in Sherman Oaks (California) and the Foulk Road Bridge in Delaware.

These two days, organized by INDURA and AFGC, aim to take stock of the different field applications and share advanced research. The AFGC guide have been presented on this occasion. 86 researchers and engineers have participate to the workshop. The Keynotes Speakers were Thanasis Triantafillou (University of Patras), Alper Ilki (Structural and Earthquake Engineering Laboratory, Istanbul Technical University), Mark Yashinsky (California Department of Transportation, Caltrans), Maurizio Guadagnini (University of Sheffield), 22 additional speakers present their work, all presentations are available on Youtube chanel ([Youtube, presentations](#)), guideline is available on AFGC web page (<http://afgc.asso.fr/>).