RISK MITIGATION

Man-Produced Accidents

amra

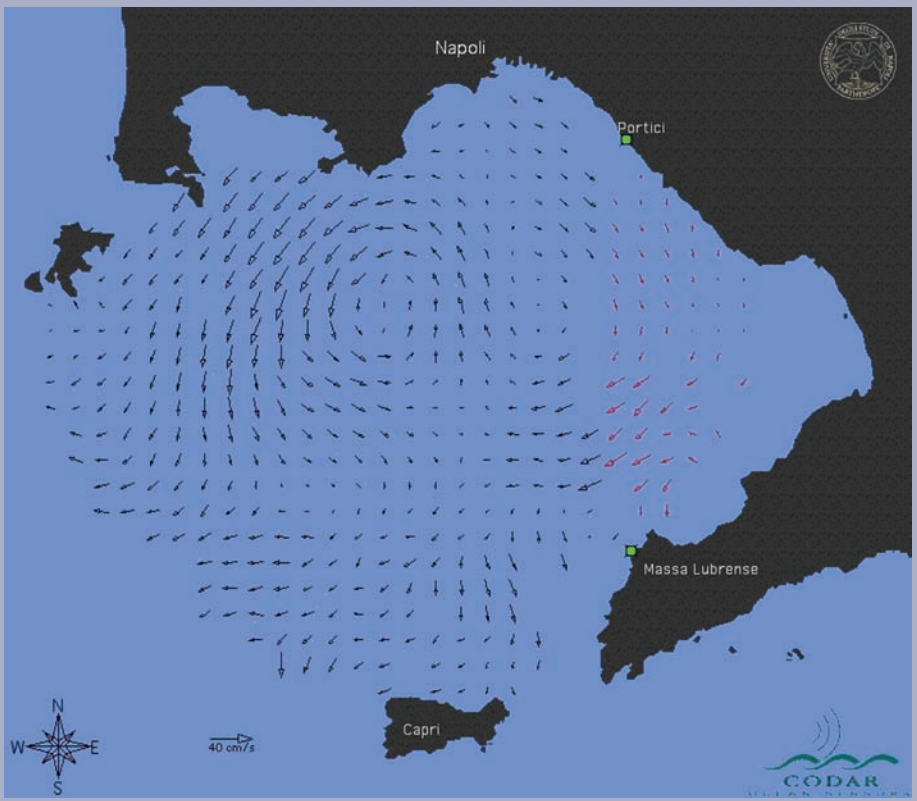
analysis and monitoring of environmental risk

AMRA ACTIVITIES

The increased frequency of industrial accidents and malicious attacks in the last decades has evidenced clearly the high vulnerability of edifices, infrastructures and life-lines to not forecasted events. Governments, State agencies and private companies managing public structures acknowledge that the security of buildings, infrastructures, lifelines and transport networks are now a priority.

Security can be significantly increased by preventive actions, including the strengthening of structures and any action aimed at decreasing the vulnerability. However a real time identification of possible damage sources and the characteristics of the dangerous event propagation can significantly reduce the impact of the event (in figure a dam as example of sensible infrastructure).

AMRA has built expertise in real time actions. It collaborates with national and international research institutions and agencies to optimize synergies and application of results. A major weakness of security actions is the lack of coordination among different actions.
In this context AMRA can offer the experience gained by its scientific staff in the early warning and management of natural risks.
AMRA can detect and forecast the path of pollutants and dangerous substances at sea by real time measurements of the shallow currents' velocity vector parameters using a network of HF coastal radars.
A prototype system is operating in the Bay of Napoli (in figure an example of circulation mapping produced by AMRA system).



MAIN OBJECTIVES

AMRA supports the Italian agencies, National and local governments and private authorities responsible for the construction, operation and maintenance of transit structures, in order to protect buildings and infrastructures exposed to unforeseeable attacks. In particular, AMRA has designed barrier system characterized by anti intrusion properties, blast resistance and radio frequency transparency.

EQUIPMENT

CODAR (COASTAL OCEAN DYNAMICS APPLICATION RADAR)

The SeaSonde is current and wave measurement system providing real-time data over large coverage areas, with ranges up to 200 km.
AMRA system covers Bay of Naples through hardware located on the coast. In particular, compact antennas are at Environment Science Department of University of Naples Parthenope; at Research Centre ENEA in Portici (Naples) and on Sorrento Coast (in figure, the antenna located in Sorrento-La Villanella).

MAIN PROJECTS

UNIVERSITY OF MISSOURI AT ROLLA, TECHNICAL SUPPORT WORKING GROUP

TENZA Project, program for the development of technologies aimed at Blast assessment of an existing infrastructure for combating terrorism requirements at home and abroad.

EPCIP 2006 (EUROPEAN PROGRAMME FOR CRITICAL INFRASTRUCTURES PROTECTION)

SAS Project, Security of Airport Structures: from stand-off fences to blast-resistant barriers using radio frequency transparent material systems.
The goal of the project has been to develop and to implement a technology aiming to deny access of intruders or terrorists to critical facilities. The challenge has been in providing the desired level of protection using material systems that maintain radio frequency (RF) permeability in order to not interfere with air traffic management and control systems.

MAIN SCIENTIFIC PAPERS

D. Asprone, E. Cadoni, A. Prota, G. Manfredi
Strain-rate sensitiveness of a pultruded e-glasspolyester composite
Journal of Composites for Construction, November-December 2009, pp. 558-564

D. Asprone, E. Cadoni, A. Prota
Tensile high strain rate behaviour of reinforcing steel from an existing bridge
ACI Structural Journal, July-August 2009, pp. 523-529

D. Asprone, E. Cadoni, A. Prota, G. Manfredi
Investigation on dynamic behaviour of a Mediterranean natural stone under tensile loading
International Journal of Rock Mechanics and Mining Sciences, 46, 3, April 2009, pp. 514-520

D. Asprone, E. Cadoni, A. Prota
Experimental analysis on the tensile dynamic behaviour of existing concrete under high strain-rates
ACI Structural Journal 106, 1, January-February 2009, pp. 106-113

D. Asprone, A. Prota, R. Parretti, A. Nanni
GFRP radar-transparent barriers to protect airport infrastructures: The SAS project
Fourth International Conference on FRP Composites in Civil Engineering (CICE2008) 22-24 July 2008, Zurich, Switzerland

D. Asprone, A. Prota, R. Parretti, A. Nanni
Radio frequency transparent barriers for airport structures: The SAS Project
Asia-Pacific Conference on FRP in Structures, APFIS 2007, S.T. Smith (ed.), 12-14 December 2007, Hong Kong, China, pp. 471-476

D. Asprone, A. Prota, R. Parretti, A. Nanni
Protection of airport facilities through radio frequency transparent fences: The SAS Project
Performance, Protection & Strengthening of Structures under Extreme Loading, PROTECT 2007, Banthia, Mindess, Fujikake (eds.), Whistler, Canada, August 20-22, 2007, in CD (ref. ITA02)

D. Asprone, A. Prota, R. Parretti, A. Nanni
Air traffic control facilities protection
Homeland Defense Journal, Philpott (ed.), August 2007, pp. 18-19

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