LABORATÓRIO NACIONAL DE ENGENHARIA CIVIL

Workshop

Sismo de L'Aquila: Ensinamentos para Portugal

O serviço Italiano de Protecção Civil e a gestão do risco sísmico

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Universidade do Minho

University of Molise

OUTLINE

- Introduction
- Organization of the Italian CP system
- Phases, objectives and activities
- Conclusions

When and how Italian Civil Protection was originated?

History ***1980 Irpinia Earthquake***

- At that time there was a total Lack of organization (single corps acted independently) → ***essentially devoted at to RESCUE.***

- On 23 November 1980, a strong earthquake struck Southern Italy. About 3,000 people killed and 10,000 injured.

- During the event, national assistance was not coordinated by a central authority.

- In 1982 the Department of Civil Protection was established, being the reference state structure for CP activities.

✓ Today it is well structured due to the experience of several catastrophes in the past 40 years.

Actions progressively evolved from only RESCUE → to event PREPAREDNESS → to PREVENTION

✓ In 2002 the National Commission for Risk Prevention was established as consultative body, providing the Department of the Civil Protection with technical advices and proposals.

Prof. Mauro Dolce - Director of the Seismic Risk and Post-Emergency Office, National Civil Protection

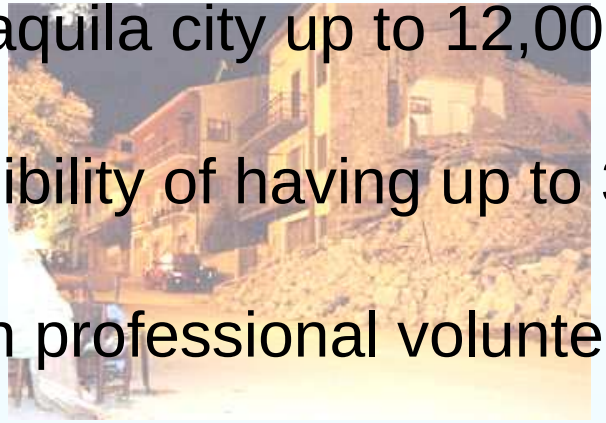
It deals with:

- **Forecasting and Warning**
- **Prevention and Mitigation**
- **Rescue and Assistance**
- **Emergency overcoming**

Coordination role rather than direct assistance

2009 Abruzzo Earthquake

- In L'aquila city up to 12,000 civil protection volunteers involved
- Possibility of having up to 30,000 volunteers ready in few days
- Often professional volunteer with specific skills are involved



THE NATIONAL CIVIL PROTECTION SYSTEM

PRESIDENCY OF THE COUNCIL OF MINISTERS

Department of Civil Protection

- Interior — National Fire-fighters Corps; Police; Prefectures
- Foreign Affairs
- Environment, land and sea safeguard — APAT
- Health — 118
- Economy and Finance — Revenue Guard Corps
- Defence — Army; Navy; Air Force; Carabinieri
- Economic Development
- Infrastructures — TERNA
- Transportation — Costal Guard; ANAS; National Highway; National Railway
- Cultural Heritage
- University and Research — I.N.G.V.; C.N.R.; National Institutes
- Public Education
- Communications
- Agricultural Policy and Forestry — State Forest Corps
- Regions
- Provinces
- Municipalities

Guido Bertolaso
Under-Secretary of State to the Presidency of the Council of Ministers
Head of Civil Protection

PROTEZIONE CIVILE · NAZIONALE ·

An Operational Committee

is set up within the Department of Civil Protection to ensure a unified direction and coordination of emergency management

NATIONAL WARNING SYSTEM

The NWS is provided by DPC, Regions and by:

"Functional Centres" (Centre for Forecasting and Surveillance of Effects - CFSE)

Collecting, elaborating and exchanging every kind of data to provide a multiple support system for decisions.

"Competence Centres" (Centre for Technological and Scientific services, development and transfer - CTS)

Providing services, information,data, elaborations, technical and scientific contributions for specific topics to share the best practices in risk assessment and management.

COMPETENCE CENTRES OF DPC FOR SEISMIC RISK MITIGATION

INGV

(Seismic surveillance, Seismological research projects, Emergency technical support)

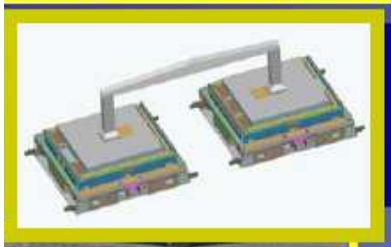
ReLUIS

(Earthquake engineering research projects, Emergency technical support)

EUCENTRE

(Earthquake engineering research projects, Emergency technical support)

RELUIS (Network of Earthquake Engineering University Labs)



Università di Napoli
Federico II AMRA

2 DOF, Dual table system:
2 tables 3x3 mq, 20tx2,5m, 1.0 m/s

Università di Pavia
Eucentre

1 DOF, Large mass table:
5x7 mq, 300tm, 1-1.5 m/s
L-shaped reaction wall

Università della Basilicata

Large reaction wall:
Real Scale
Pseudodynamic Tests

Università di Trento

Large reaction wall:
Real Scale
Pseudodynamic Tests

ENEA
UTS MAT

ENEA
Ente per le Nuove Tecnologie, l'Energia e l'Ambiente

6 DOF:
4x4 mq, 20 t, 0.5 m/s

Protezione Civile Nazionale

PHASES, OBJECTIVES AND ACTIVITIES

PHASE 1 – PRE-EVENT (PEACE TIME)

PHASE 2 – EVENT (EMERGENCY)

PHASE 3 – POST-EVENT (RECOVERING)

PHASE 1: PRE – EVENT (PEACE TIME)

Objectives: **Reduction of the seismic risk**

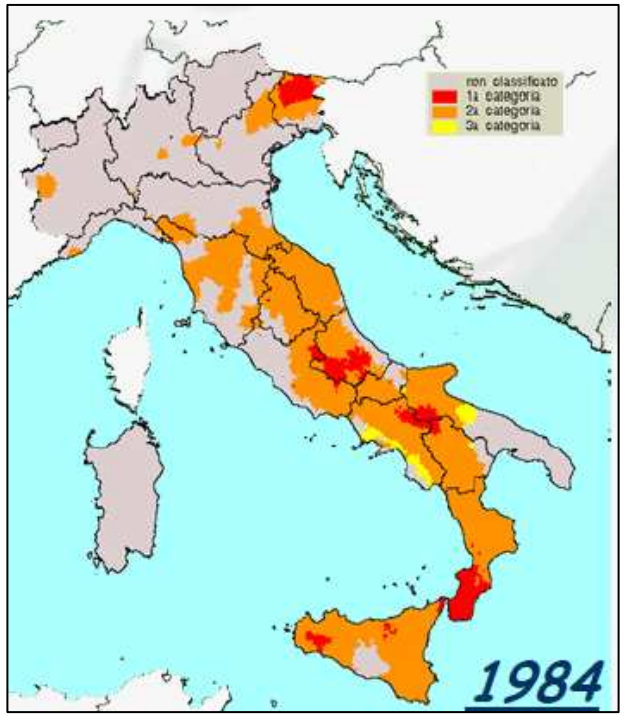
1. ***Improvement of seismic building codes***

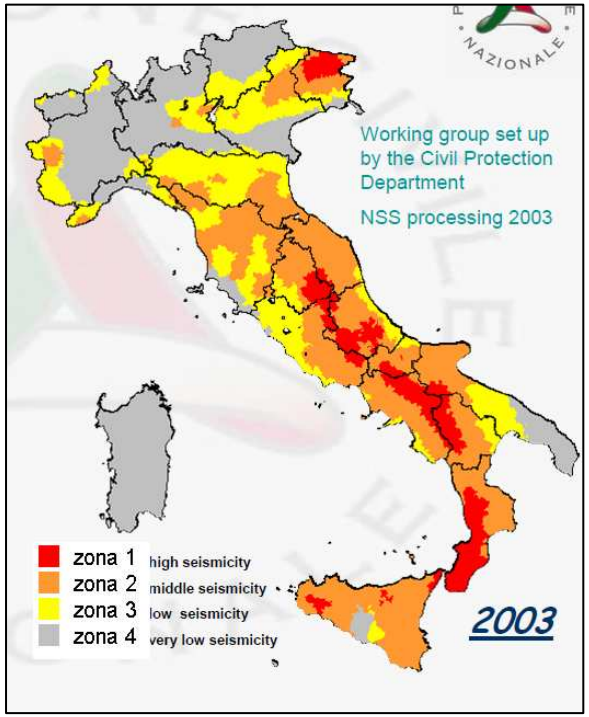
2. ***Information activities***

PHASE 1: SEISMIC PREVENTION

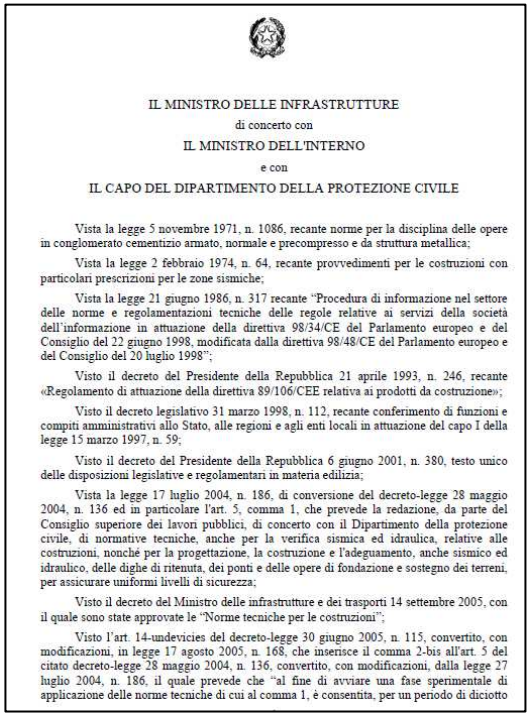
Significant innovation and action programs for seismic risk reduction are usually introduced just after destructive earthquakes.

NEW SEISMIC ZONING, 2003





NEW SEISMIC CODE, 2009



IL MINISTRO DELLE INFRASTRUTTURE
di concerto con
IL MINISTRO DELL'INTERNO
e con
IL CAPO DEL DIPARTIMENTO DELLA PROTEZIONE CIVILE

Vista la legge 5 novembre 1971, n. 1086, recante norme per la disciplina delle opere in conglomerato cementizio armato, normale e precompresso e da struttura metallica;

Vista la legge 2 febbraio 1974, n. 64, recante provvedimenti per le costruzioni con particolari prescrizioni per le zone sismiche;

Vista la legge 21 giugno 1986, n. 317 recante "Procedura di informazione nel settore delle norme e regolamentazioni tecniche delle regole relative ai servizi della società dell'informazione in attuazione della direttiva 98/34/CE del Parlamento europeo e del Consiglio del 22 giugno 1998, modificata dalla direttiva 98/48/CE del Parlamento europeo e del Consiglio del 20 luglio 1998";

Visto il decreto del Presidente della Repubblica 21 aprile 1993, n. 246, recante «Regolamento di attuazione della direttiva 89/106/CEE relativa ai prodotti da costruzione»;

Visto il decreto legislativo 31 marzo 1998, n. 112, recante conferimento di funzioni e compiti amministrativi allo Stato, alle regioni e agli enti locali in attuazione del capo I della legge 15 marzo 1997, n. 59;

Visto il decreto del Presidente della Repubblica 6 giugno 2001, n. 380, testo unico delle disposizioni legislative e regolamentari in materia edilizia;

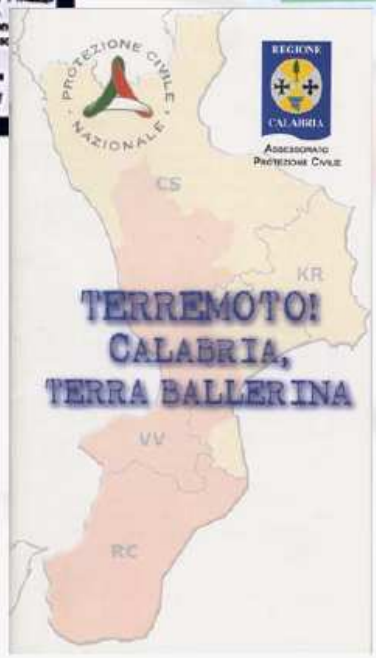
Vista la legge 17 luglio 2004, n. 186, di conversione del decreto-legge 28 maggio 2004, n. 136 ed in particolare l'art. 5, comma 1, che prevede la redazione, da parte del Consiglio superiore dei lavori pubblici, di concerto con il Dipartimento della protezione civile, di normative tecniche, anche per la verifica sismica ed idraulica, relative alle costruzioni, nonché per la progettazione, la costruzione e l'adeguamento, anche sismico ed idraulico, delle dighe di ritenuta, dei ponti e delle opere di fondazione e sostegno dei terreni, per assicurare uniformi livelli di sicurezza;

Visto il decreto del Ministro delle infrastrutture e dei trasporti 14 settembre 2005, con il quale sono state approvate le "Norme tecniche per le costruzioni";

Visto l'art. 14-undevicies del decreto-legge 30 giugno 2005, n. 115, convertito, con modificazioni, in legge 17 agosto 2005, n. 168, che inserisce il comma 2-bis all'art. 5 del citato decreto-legge 28 maggio 2004, n. 136, convertito, con modificazioni, dalla legge 27 luglio 2004, n. 186, il quale prevede che "al fine di avviare una fase sperimentale di applicazione delle norme tecniche di cui al comma 1, è consentita, per un periodo di diciotto

PHASE 1: INFORMATION ACTIVITIES

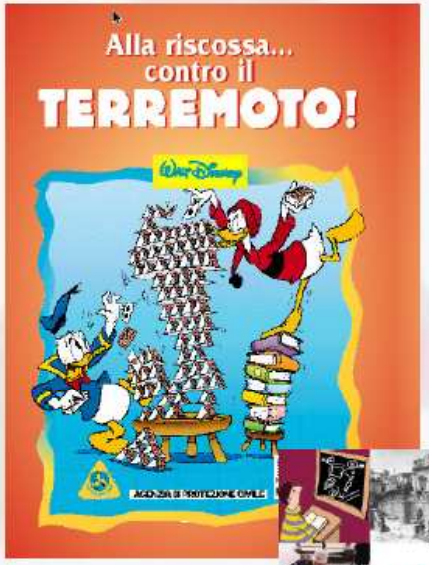
Awareness Campaigns



Informing people on risk and prevention, by describing the behaviour to adopt in case of earthquake.

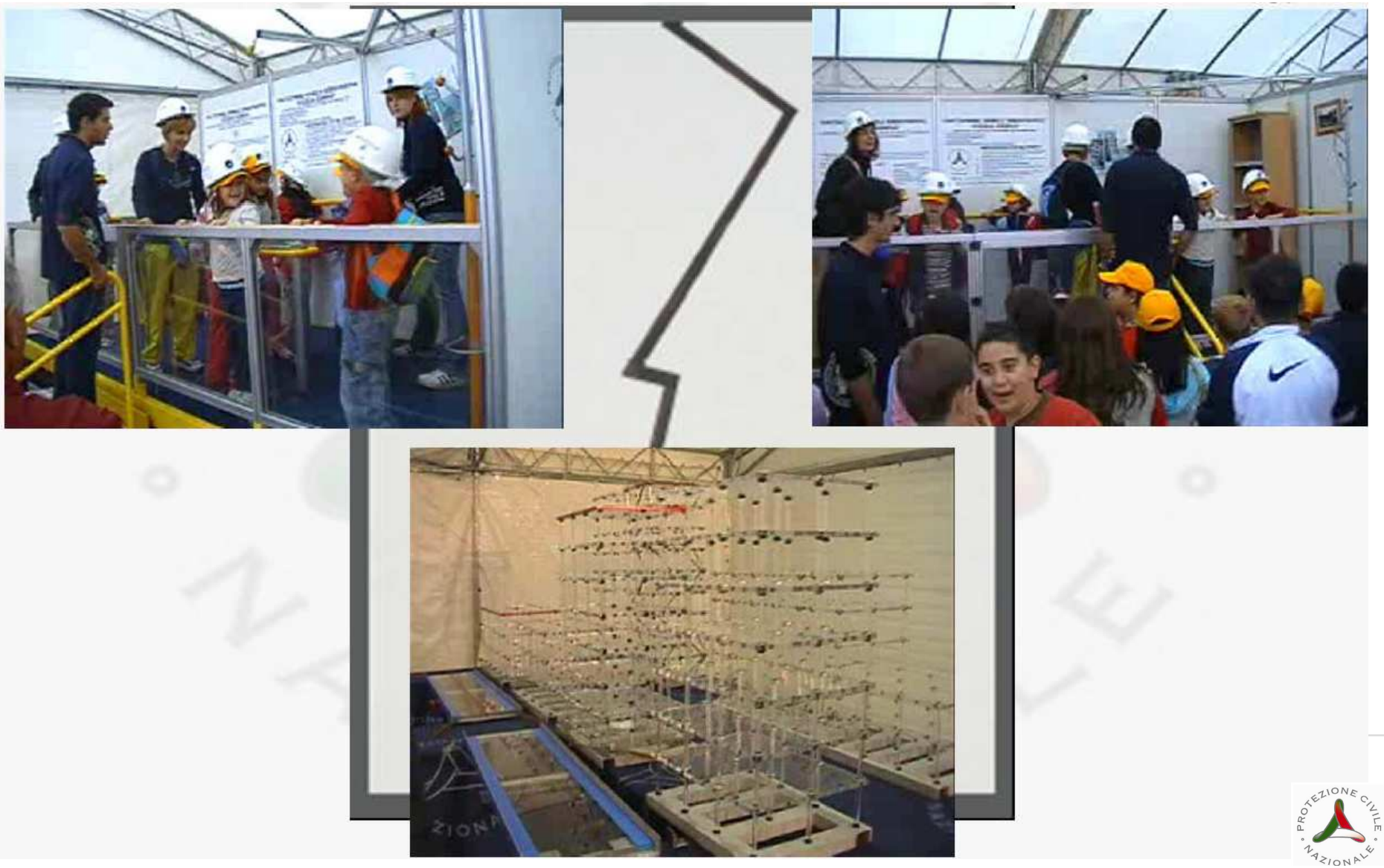
INFORMATION ACTIVITIES

Phase 1: Education to risk



Divulgation tools on earthquake, seismic risk and prevention (books, multimedia, leaflets, exhibitions)

PHASE 1: EDUCATION TO SEISMIC RISK



PHASE 2: EVENT (EMERGENCY)

When:

at the occurrence of an earthquake, from the time of the event up to some weeks or months after (depending on the intensity)

Objectives:

Rapid collection of information on the event, including all seismological, engineering, economical and social issues, in order to:

- optimise emergency operations
- plan the re-construction actions

PHASE 2: EVENT (EMERGENCY)

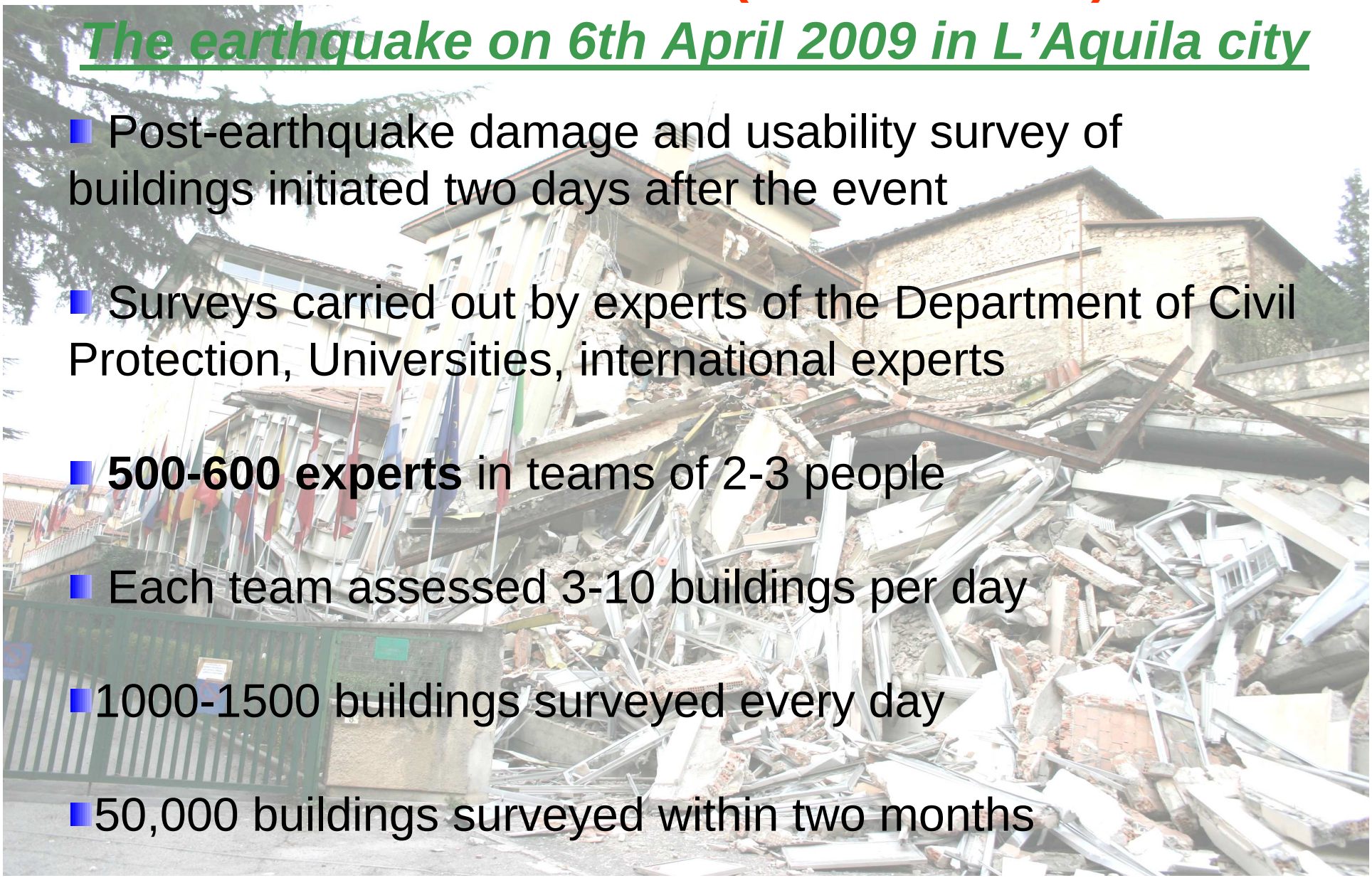
The earthquake on 6th April 2009 in L'Aquila city

- *About **300 deaths***
- *Up to **100,000 people were sleeping out of their homes***

- The Operational Committee activated in Rome immediately after the event
- **50,000 people were assisted by the CP** *(about 35,000 living in tents, 30,000 in hotels, the rest living in second homes or sleeping in their cars)*
- **165 tent-camps**
- **39 field sanitary structures**

PHASE 2: EVENT (EMERGENCY)

The earthquake on 6th April 2009 in L'Aquila city



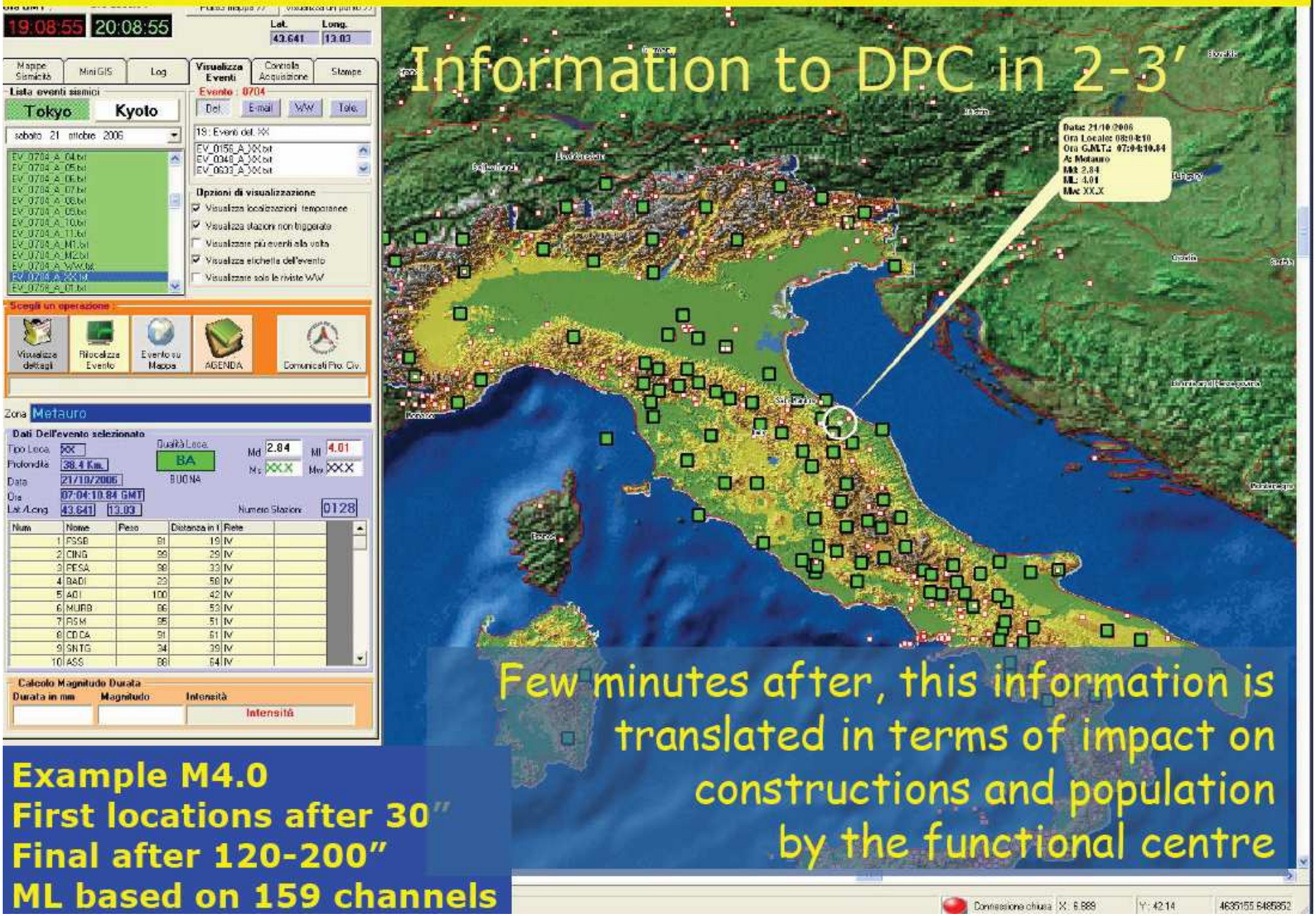
- Post-earthquake damage and usability survey of buildings initiated two days after the event
- Surveys carried out by experts of the Department of Civil Protection, Universities, international experts
- **500-600 experts** in teams of 2-3 people
- Each team assessed 3-10 buildings per day
- 1000-1500 buildings surveyed every day
- 50,000 buildings surveyed within two months

PHASE 3: POST- EVENT (RECOVERING)

POST-EVENT TIMETABLE OF TECHNICAL ACTIVITIES

2'-5'	*EPICENTER AND MAGNITUDE EVALUATION*	*Collecting and processing of seismometric network data by INGV*
15'-60'	*SIMULATED DAMAGE SCENARIOS AND DATA PROCESSING OF MONITORING SYSTEMS*	*Software simulation of the earthquake impact on constructions, Collecting and processing of soil and strategic building accelerometric data*
6 h-150 h	*SITE SURVEYS FOR MACROSEISMIC AND COSEISMIC EFFECTS*	*Site evaluation of Mercalli Intensity, Geological surveys for landslides, surface faulting and soil liquefaction*
6 h-3 m	*TEMPORARY MONITORING OF SOIL AND STRUCTURES*	*Installing of temporary soil accelerometric stations and structure monitoring systems*
24 h-6 m	*POST – EARTHQUAKE DAMAGE AND SAFETY ASSESSMENT*	*Building inspections for damage and usability assessment. Temporary houses.*

REAL TIME EARTHQUAKE MONITORING SYSTEM INGV-DPC



Example M4.0
First locations after 30"
Final after 120-200"
ML based on 159 channels

POST-EMERGENCY ACTIVITIES

S. GIULIANO DI PUGLIA - 2002

INSTALLATION OF TEMPORARY PREFABRICATED TIMBER HOUSES

CONCLUSIONS (1)

- The Italian CP systems represents an important strength in all those situations where a prompt and significant mobilisation of men and assets is indispensable to face emergency situations

- Good organization, high quality and efficiency of the logistics - Real time response

- Courses on emergency prevention and seismic risk management for regional presidents, city majors and public servants

CONCLUSIONS (2)

A strong connection with the scientific world

Positive implications are:

- Getting funds for research activities
- Optimising the resource allocation for risk mitigation
- Making precise and rapid forecasting, for effective emergency actions
- Optimising resources and actions for emergency overcoming

CONCLUSIONS (3)

"Building a culture of prevention is not easy. While the costs of prevention have to be paid in the present, its benefits lie in a distant future. Moreover, the benefits are not tangible;

THEY ARE THE DISASTERS THAT DID NOT HAPPEN".

UN Secretary-General Kofi Annan: "Introduction to Secretary-General's Annual Report on the Work of the Organization of United Nations, 1999" (document A/54/1)

CONCLUSIONS (4)
International relationships

- EU Member States started offering their help through the Community CP Mechanism at a very early stage of the disaster

- Possibilities may include the EU Funds

EU Solidarity fund; EU Structural and Rural Development Funds

Experience has shown that an integrated and multi-hazard approach should be taken to develop effective measures in both in prevention and in direct response to disasters.

THANK YOU FOR YOUR ATTENTION