GIS To Improve Emergency Services Response To Nuclear Incident

Esri International User Conference, San Diego, July 24th 2012

Essonne County Fire & Rescue Service (SDIS 91)

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Q: What kind of maps were available to you?
A: ...

October 6th 2011: Cpt ISHII shares experiences with nuclear, biological and chemical emergencies specialists from SDIS 91.
The Emergency Mapping Team (EMT)

Maps for:
- **Recovery** phase
- National gov level
- Communication tool
What about the **RESPONSE** phase?

How to help Cpt. ISHII manage his team and report to officials and decision-makers?
Essonne County and its Fire & Rescue Service

• 20 miles south from Paris capital
• a 700 square mile territory
• 1,170,000+ inhabitants
• 98,000+ emergency ops every year

Defended by:

51 fire stations
2,900+ firemen
1 great GIS ;-)
The CEA’s Saclay Research Center

- The French Alternative Energies and Atomic Energy Commission (CEA) @ Saclay, Essonne County

→ civilian nuclear research
→ 7 nuclear facilities
→ 6,000 people working on site
→ 9,000 people living around

Intro
Context
Essonne County
CEA @ Saclay
Need Tools...

M²IRAGE
Method
Architecture
Features

Results
What’s Next?

Credits

Risk of beam exposure and radioactivity contamination

Emergency Response Plan

Emergency Preparedness Exercise
Coordination very complex

Data workflows not optimized
Sharing a common view → SITUATIONAL AWARENESS
Near real-time reliable measurements data transmission → efficiency

Common Operational Picture (COP)
Enhance decision-making for rapid population confinement, evacuation or shelter-in-place.
M²IRAGE System: Method

1. Estimate
   - Propagation Area

2. Select
   - Measurement Points

3. Plan
   - Measurements Tasks

4. Receive, Validate, Store

5. Build Summary View
Distant users
Secured access
M²IRAGE Mobile

- mobile application
- map viewer / GPS coordinates
- measurements values input form
- wireless data transmission
Overview of the risk propagation area and predefined measurement points.
Normalized and non normalized symbol gallery to represent emergency actions and vehicles on site.
Monitoring on-the-field radioactivity measurements made by crews or sensors through time
Assessing population (nr of individuals and ages) in a specific area nearby the incident.
Monitoring Buildings States after an Earthquake.
Overlaying simulation plume from in-house software CERES and risk propagation area to assess exposure to contamination.
M²IRAGE Web: Main Features

Rescue - Locating People Gatherings on the site
(Pictures Uploading or Live Cams)
Monitoring Emergency Crews Actions (Georeferenced Pictures Uploading)
M²IRAGE successfully utilized on 5 major Emergency Preparedness Exercises (3 Radiological, 1 Chemical, 1 Multi-Attack) between Sept. 2009 and Jan. 2012

Patent Ref. WO2011/ 027086
« Evaluating a Situation of Being Exposed to Environmental Risks. »
What’s Next?

M²IRAGE fully operational in Essonne County.

Nation-wide deployment of M²IRAGE on 5 CEA’s Research Centers.

Lots of new functionalities to come for next versions:
<ul>
  <li>Integration of the simulations’ plumes from Environment Protection Agency’s ALOHA software</li>
  <li>Full administration console to manage data sources</li>
  <li>“Webization” of CEA’s MISTER and SPIRIT modules</li>
  <li>etc…</li>
</ul>
For CEA’s Saclay Research Center:
- Henri ROCHE, Head of Radiation Protection Department
- Jean-Marie FAUQUANT, Radiation Protection Specialist
- Hubert LELACHE, Radiation Protection Specialist & Developer

For SDIS91:
- Fire Officer Olivier GERPHAGNON, Radiological, Biological and Chemical Emergency Specialist
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Thank you for your attention.

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