GIE : EDF – CEA – AREVA
INTERVENTION ROBOTIQUE SUR ACCIDENTS

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IAEA – January 2013

Agenda

- Who are we ?
- Equipment
- Organization - Drills

1988

GROUPE INTRA CREATION

Groupe INTRA was created by the three French Nuclear Operators

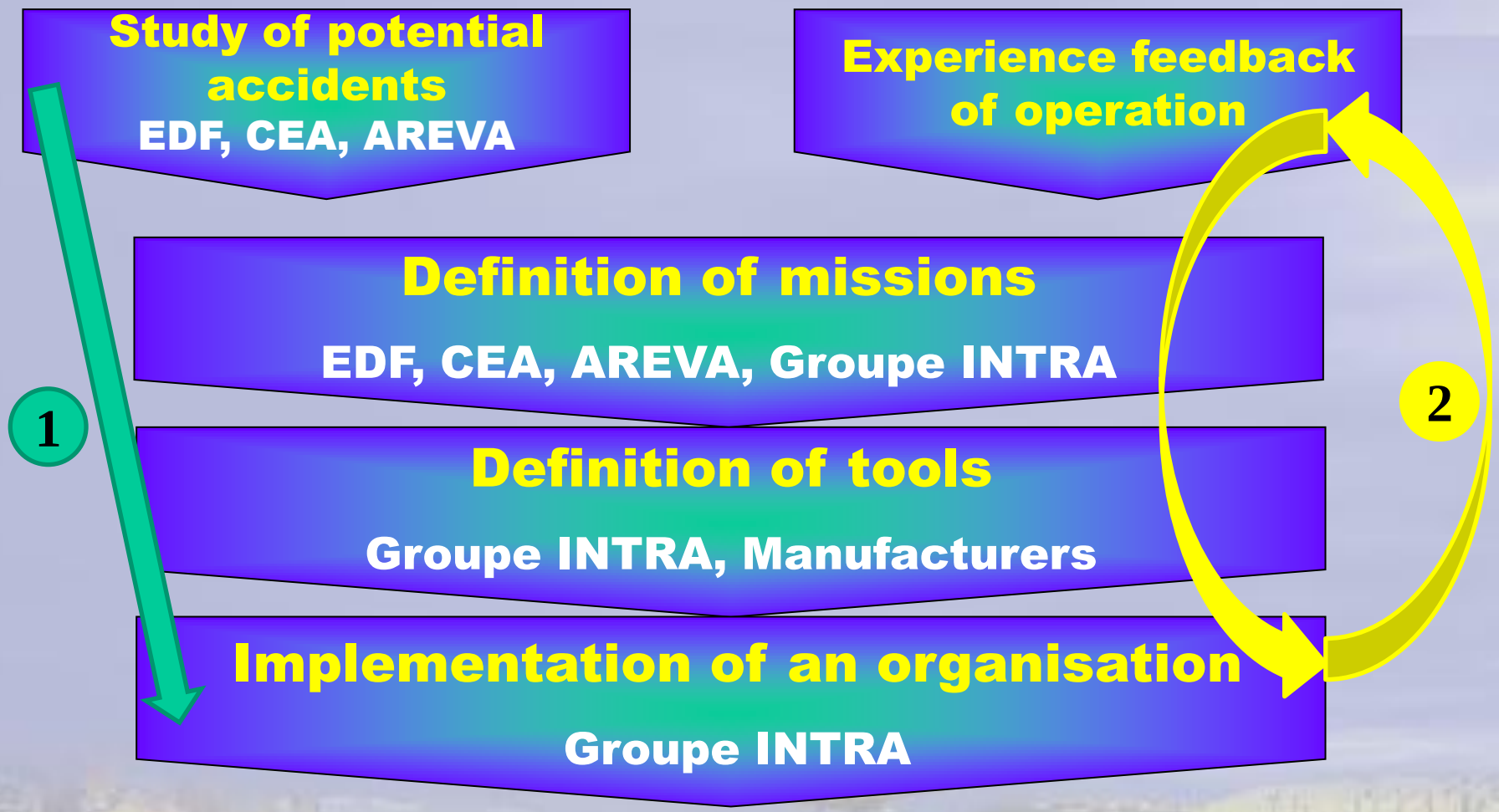
It is located on the industrial site on the EDF Chinon Nuclear Power Station (since July 1995)

MISSIONS

Main missions in the constitutive contract

- **A mission of equipment**, to DESIGN, IMPLEMENT, OPERATE, and MAINTAIN a fleet of specific remote-controlled equipment, able to intervene instead of human beings, in the case of an accident in one of its members' nuclear site
- **A mission of intervention**, to be ready to intervene permanently with its resources, as quickly as possible, and always within 24 hours all over the French territory

Applied Methodology



MISSIONS

- To make site inventories
- To supervise equipment
- To carry out specific operations
- To carry out civil engineering

- Inspections
- Measurement of contamination and radiation levels
- Recovering samples

MISSIONS

To make site inventories

To supervise equipement

To carry out specific operations

To carry out civil engineering

Penetrations

Pumps on safety circuits

Safety equipment

Indicators, measuring devices

MISSIONS

To make site inventories

To supervise equipement

To carry out specific operations

To carry out civil engineering

Operation on valves

Operation on actuators, switches

Withdrawal of sources (filters..)

MISSIONS

To make site inventories

To supervise equipement

To carry out specific operations

To carry out civil engeenering

Access recognition

Building roads

Digging, banking, groundwork

Scraping the soil

Main Information

- **Permanent staff** : 20
- **Pilots from members** : <30
- **Yearly Budget** : # 4 M€
- **Global investment** : # 40 M€
- **Members shares** : 50 % EDF
  37.5% CEA
  12.5% AREVA

Pilots training

- **Pilots come from plants of operators. They are on call for Group Intra.**
- **They are trained and qualified in Chinon training's center**
- **When they are able to drive robots, they obtain a « driving licence » (certificate of safe ability) for one year.**

EQUIPMENT

Logistics

Indoor robots

Outdoor robots

Radiological characterization means

Hélinuc
Aerial
Mapping

Skylink

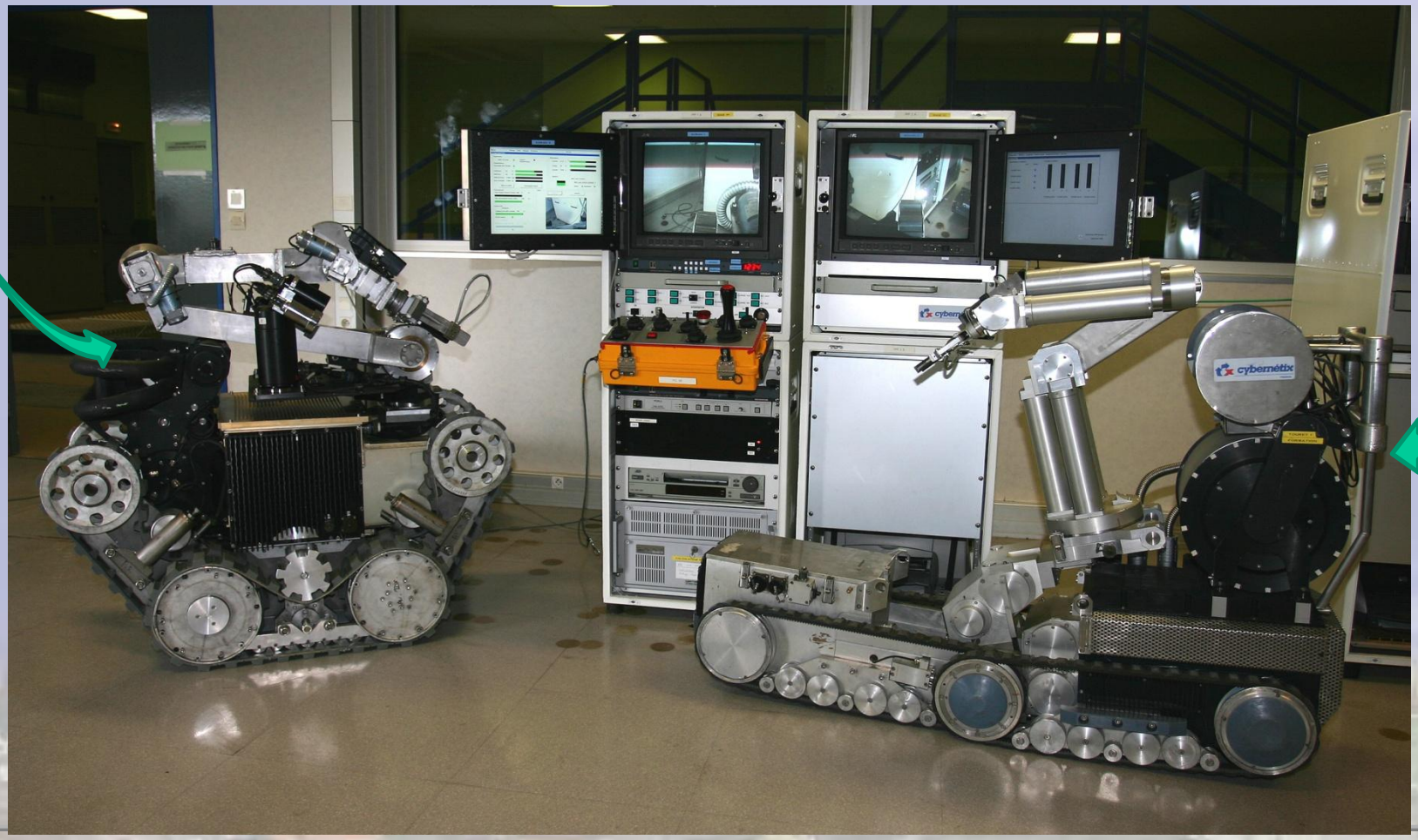
Gamma tracer

Civil Engineering

Indoor robots

EOLE Robotised Device for Observation and Localisation in the Environment

EROS Robotised Device for Observation and Surveying



EROS/EOLE concept

An onboard cable drum (length of the cable : 350m) linked to 4 simultaneous videos

A harsh-environment resistant electronics (integrated dose up to 10^4 Gy)

A large autonomy of energy (≈8h : batteries Lithium Ion)

Measurement devices (ex: gamma goniometer for measurement and localisation of isolated sources)

Outdoor robots

ERASE : External Reconnaissance, Assistance and Surveillance Robot

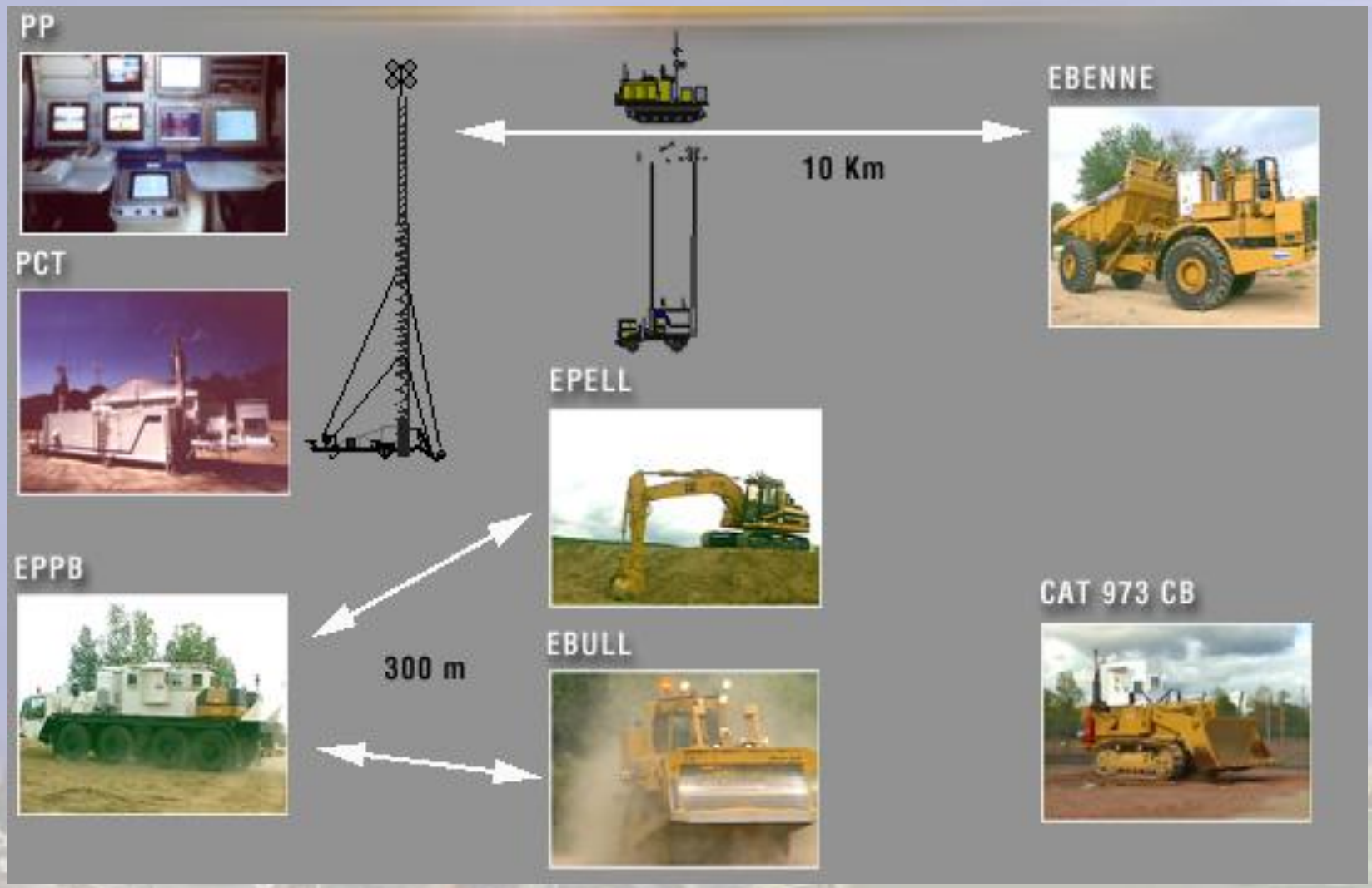
ERASE External Reconnaissance, Assistance and Surveillance Robot

Some of its characteristics :

- Autonomy : 10 h
- Max speed : 4,2 m/s
- Vision : 5 cameras
- Max integrated radioactivy level : 10^3Gy
- Remote controlled up to : 5 km

Civil Engineering

Civil Engineering



EPPB Armoured Mobile Command Post

UAV for pictures, video and measurement

Radiological characterization means

Aerial Gamma system mapping : HELINUC

Skylink Gamma tracer

HELINUC Airborne gamma mapping system

HELINUC : Implementation

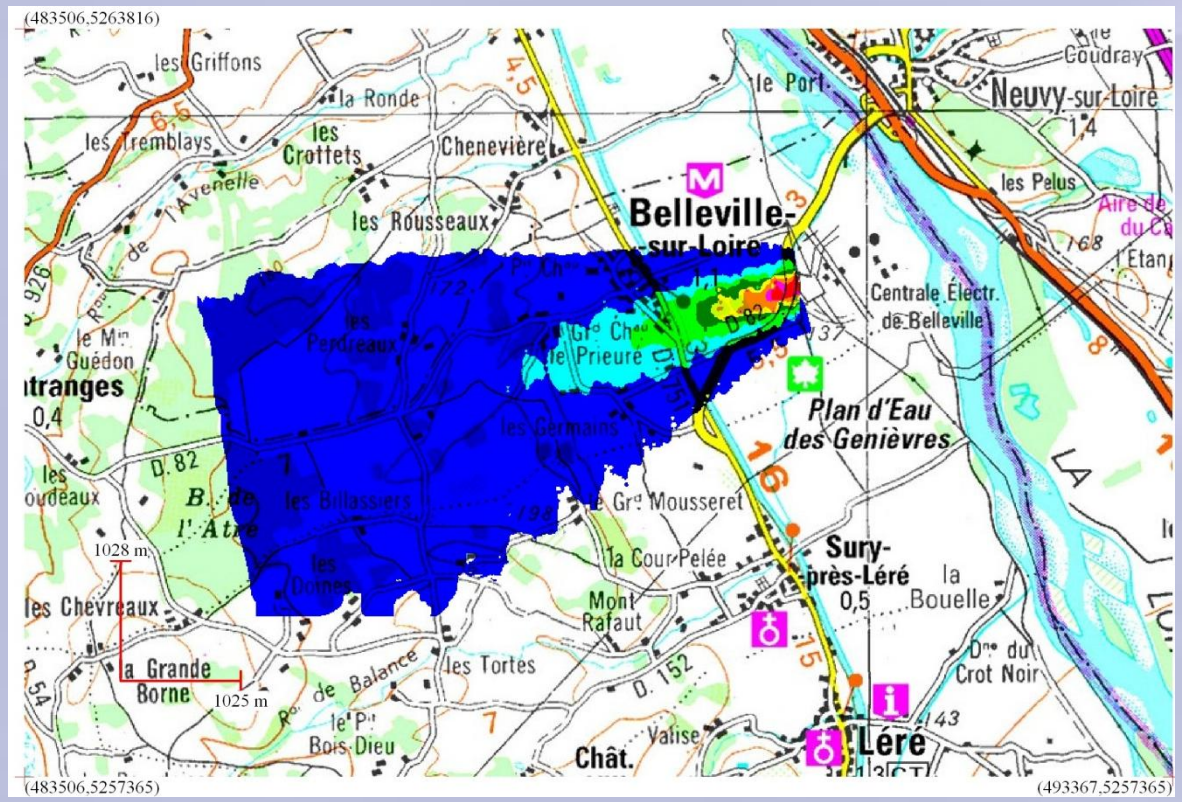
2 – Data storing

Operating conditions

- **Integration time : 2s**
- **Altitude : 50m**
- **Speed : 70km/h**
- **Offset : 80m**

➔ **Analysed area : 5 to 10 km²/day**

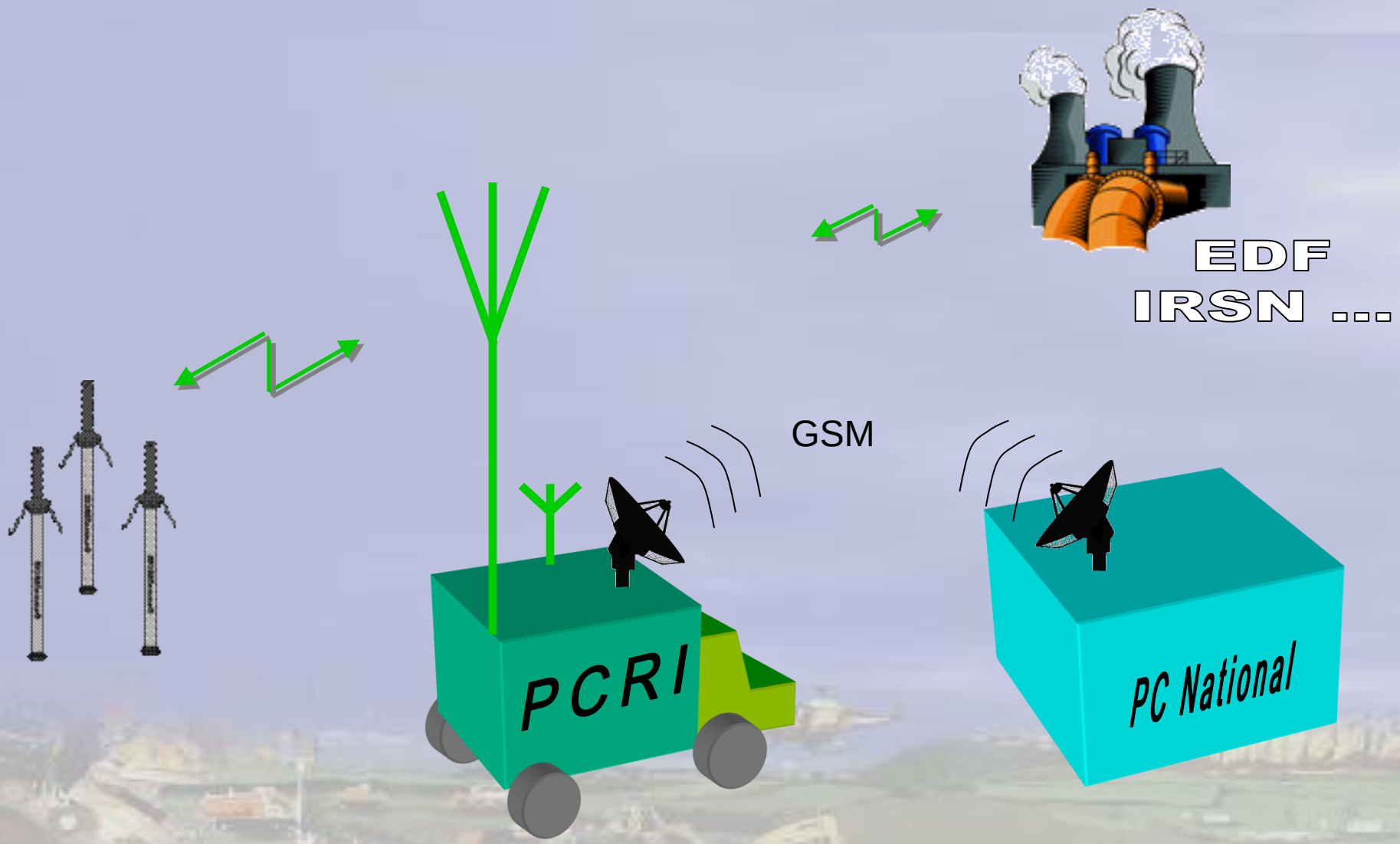
HELINUC : Map of the exercise of Belleville (NPP) (simulation)



Dose rate from 1m ground level (µSv/h)

Skylink mobile system

SKYLINK : Transmitting radiameters

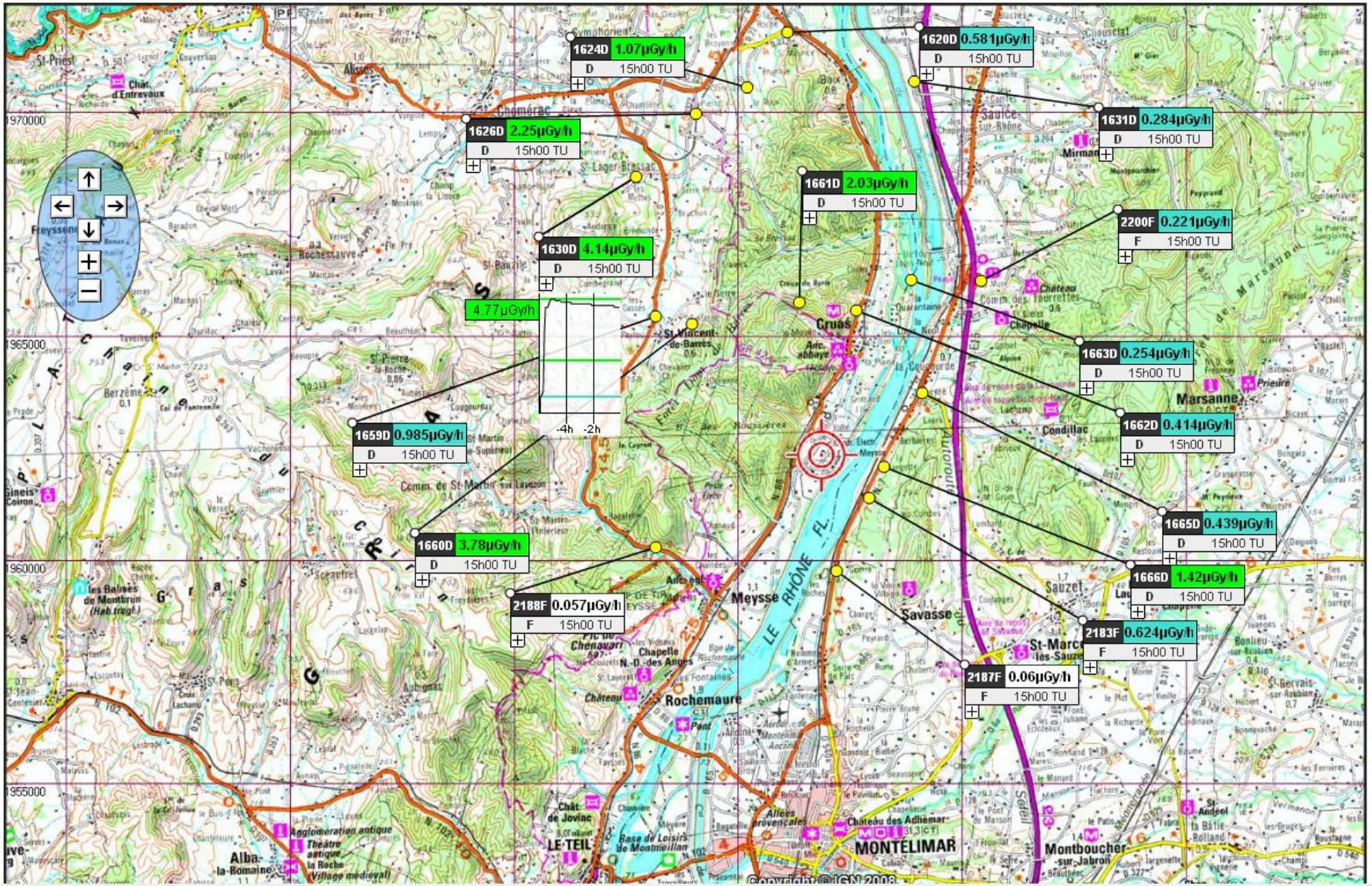


Intra - INtervention Robotique

www.groupe-intra.com/pages/interventions/affiche_carte.php

Sondes | Cartographie | Vidéo

CARTE



Interventions

DRILLS

In order to verify its operability, Groupe INTRA organises or participates in national and local drills

There are several sorts of drills :

- **2 drills minimum per year (5)**
  - With all the equipment, in an external site

About

- **5 call drills per year,**
  - Without mobilisation

- **Restricted drills**
  - Depending on the internal needs
  - Every Friday, with the « on call team »

Real Interventions

- Radiological ground characterisation : initial situation of NPP, post-Tchernobyl measurements
- Characterisation of installations
- Transfer of radiological sources (irradiated filters) on NPP
- Work on irradiated environment (drilling)

Organization

Some elements of organization

Groupe INTRA was founded to intervene in the case of a major accident in one of its members' plants.

The team and the equipment must be ready to intervene whithin 24 hours on the whole French Territory

This is verified in exercises and real interventions

Alert

In case of a major crisis,
Groupe INTRA can be requested by :

- **The national Crisis Centre of one of its members**
- **The National Authorities**
  (Defense and Civil Security of France)
- **A foreign company if an assistance agreement exists**

The intervention team, on call 24 hours a day, is immediately called after the initial alert.

It must be ready in Groupe INTRA premises in less than 1hour

Groupe INTRA mobilization

- **Alert**
- **< 1hour :** intervention team is mobilized
- **< 3-5 hours :** equipment is tested, loaded, and ready for joining the plant
- **Journey :** between 1 and 12 hours, depending on the plant
- **Test and qualification after unloading**
- **< 24 hours after alert :** ready to intervene

After the accident in Fukushima-Daiishi NPP

One week after the accident, Groupe INTRA was ready in Chateauroux airport

International relations

Reception and visits with foreign services (Europe, asia,…).

With our foreign counterparts connected to nuclear operators :

- **Germany : KHG – Agreement of mutual assistance in the case of accidents. Common exercises. Purchasing of same equipment**
- **Russia : ITUCR (Emergency center of St Petersburg) – Information exchanges - Part of agreement CEA-ROSATOM**
- **Japan : FEPC and JAPC, in charge of the creation of a "Japanese Group INTRA"**

Thank you for your attention

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