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IRSN
INSTITUT DE RADIOPROTECTION ET DE SÛRETÉ NUCLÉAIRE

Nuclear or radiological emergencies: IRSN's missions and organization

IRSN FACT SHEETS

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Key figures

400 team members in the emergency pool

10-15 national emergency exercises per year

2,000 training hours per year

In the event of a nuclear or radiological emergency, irrespective of its cause, IRSN's mission is to propose to the authorities technical, health, and medical measures to protect populations, workers, and the environment. The objective is to be able to provide technical guidance for all possible situations occurring in France or for any event abroad that might have an impact on the national territory.
The Institute is also supporting the communication of the French government with the public, by providing didactic material on understanding the situation and the radiation risk, and, by explaining the measurements of radiation in the environment that it centralizes, interprets, and makes available.

In order to be able to perform its missions, IRSN develops and maintains an operational emergency organization, which can be activated in less than one hour 24/7. It includes:

- An alert and mobilization system,
- A modular emergency organization,
- An assessment method,
- Emergency response resources,
- A pool of trained and experienced staff.

Alert and mobilization system

An on-call roster, consisting of a multidisciplinary team of 32 people renewed each week, enables for the mobilization of the emergency organization in less than an hour. A duty manager who represents IRSN's "permanent entry door" ensures that all requests regarding any potential or on-going emergency are processed. He is the sole focal point of alerts, both external from operators and internal, for example, from the remote monitoring network.
Depending on the nature and severity of the events, IRSN's Director General activates the Emergency Response Organization and appoints an Emergency Director to manage the response.

Emergency Response organization

To manage an emergency situation, IRSN implements a flexible response organization which relies on a prepared three-tier level. The level of the response organization is chosen according to the needs linked to the event and may be regularly adapted according to developments in the situation. Each level systematically includes the activation of the Technical Crisis Center (TCC) located in Fontenay-aux-Roses (near Paris) and, upon request, the support of a field deployable mobile unit for measurements in the environment and radiological control of people, of the Institute's fixed laboratories, of the remote monitoring network and of representatives dispatched to assist the concerned Prefect at local level and the Interministerial Crisis Unit (ICC) at national level.

Expertise method

Based on the data received (parameters of the affected facility, radiation measurements in the environment, meteorological data provided by Météo-France), the TCC teams carry out an iterative assessment of the facility's situation and the consequences for the population and the environment, as well as a prognosis of the development of the situation and the potential consequences. This Assessment and Prognosis method is shared with nuclear operators to compare the current understanding of the situation and the assessment of its consequences before recommendations are sent to the national and local authorities.
The deliverables regularly forwarded to the authorities in a proactive or reactive mode are written messages presenting IRSN's recommendations, generally with situation maps showing the assessed consequences, thus providing technical guidance on the radiological situation to support decision making on protection of the population.

Contact
Emmanuelle Mur
Tel. +33(0)1 58 35 96 71

Registered office
31, av. de la Division Leclerc
92260 Fontenay-aux-Roses

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IRSN is a French State-owned industrial and commercial establishment (EPIC) the missions, status, and operation of which are determined by Articles L592-45 to L592-49 and R592-39 to R592-61 of the French Environment Code. IRSN is under the joint supervision of the French Minister for the Environment, the French the Minister of Defense, and the French Ministers of Energy, Research, and Health.

As a public expert, IRSN advances scientific knowledge to manage all nuclear and radiation risks. Through its research, methods, and interactions with all stakeholders, IRSN assesses these risks and their consequences independently. It thus contributes to their prevention, detection and limitation of their possible effects, in order to protect the population and the environment.

Emergency Response resources

Technical Crisis Center

The Technical Crisis Center (TCC) is the backbone of IRSN's emergency response organization. It is structured into thematic units (assessment of the facility, assessment of the radiological consequences, health issues, communication, international support, logistical support) and includes software developed to quickly assess the situation, e.g. actual or potential radioactive releases in the atmosphere, dispersion of radioactivity in the environment, and doses which are or would be received by the population and emergency responders.
The TCC has telecommunication means including specialized links with certain operators, allowing real-time retrieval of data on the facility and the environment.

Remote monitoring network

The Teleray national network, devoted to the continuous monitoring of ambient gamma radiation, is an alert and monitoring system in case of a radiological event. Over 450 stations are installed in the country. Real-time monitoring is carried out from a remote monitoring center located at Le Vésinet (Paris metropolitan area), which is in contact with the TCC when the emergency response organization is activated.

Mobile unit - means for measurements in the environment

When an emergency occurs, IRSN may send experts and resources to the spot, to measure radiation in the environment. These resources are made available to the local public authorities.
As IRSN is in charge of the national monitoring strategy and of its coordination, this unit is also tasked with centralizing, interpreting, and reporting on all measurements through a dedicated application called CRITER.
Mobile measurement resources include detectors that can be embarked on board aircrafts and helicopters for aerial measurement and mapping of the contaminated territories which can be associated with resources on the ground (vehicles, quad bikes, pedestrian equipment). They also comprise three laboratory vehicles for the environmental sample analyses of various matrices (water, soil, plants, etc.) as well as different equipment to be deployed in the environment (stations for remote data transmission, in situ spectrometers, air samples) on board four response vehicles.

Mobile unit - means to control people

IRSN may also send experts and resources to the location of the emergency, to measure the internal radiation contamination of people likely to have been exposed in the population and among emergency responders. These resources, made available to the public authorities, are embedded in the local population sorting and monitoring structures put in place by the local authorities.
IRSN's measurement means include four vehicles each with four measurement stations, four air transportable shelters with ten measurement stations, and two assessment trucks. IRSN centralizes the results in an application called CRIHOM.

Fixed laboratories

IRSN can use its fixed laboratories devoted to the monitoring of environmental samples and people (radiotoxicological analyses, internal contamination measurements, dosimeter analyses). These laboratories, generally tasked with monitoring activities, have developed simplified methods for rapid assessment of radiation levels.

Emergency Response Team

The Institute's Emergency Response Team brings together some 400 experts who are tasked with one of the technical positions of the Technical Crisis Center or the mobile unit. Half of this pool participates in the weekly on-call roster.
Each team member is required to participate in at least one exercise per year as well as in training, and shall contribute to the feedback.

Emergency exercises

IRSN participates in all national emergency exercises organized each year by the Ministry of the Interior and Safety Authorities. It also develops technical scenarios which mock accidents in nuclear facilities and simulate the environmental contamination. These technical scenarios are prepared alternately with the operators. IRSN also participates in international exercises, notably those organized by the IAEA, in field exercises in cooperation with the fire department, and organizes internal exercises on specific topics, such as malicious acts.