The technological offers of CEA Cadarache (know how, expertises, patents, software, platforms)

June 22nd 2018 Version

SEIMIRAD

Training Structure for Radiological Interventions

Summarized presentation of the technology

The SEIMIRAD platform, 100% operational, reproduces, on a full scale, the actual operating conditions of a "hot laboratory" type nuclear facility, without radioelements but in its main premises and using its actual equipment particularly a nuclear type ventilation designed to ensure the dynamic containment of radioactivity (see detailed description below).

Its main vocation, during simulation exercises, is to train and instruct:

- fire, accident and intrusion response teams,
- plant operators in the use and handling of ventilation in normal and degraded situations,
- equipment maintenance teams, including nuclear ventilation systems.

Its mission is also to test, with a view to qualification:

- intervention equipment,
- nuclear ventilation equipment.

Benefits and competitive advantages offered by the technology

- A platform chiefly dedicated to training and education.
- A facility replicating all the actual premises and equipment to simulate a response under standard nuclear facility conditions
- On-site technical staff to ensure proper operation of the equipment
- A teaching team with training provided and adapted on a case by case basis

Areas of application (nuclear and non-nuclear)

This platform focuses on all industrial sectors involving a radiological or fire risk. It particularly concerns:

intervention teams of enforcement and protection (police, fire brigade, Gendarmerie),

nuclear operators' response teams: rescue operations, fire-fighting, radiation protection, etc. to enable them to strengthen and improve the coordination of their various response teams,

managers and prevention officers in order to develop incident or accident scenarios,

operating teams, particularly to control dynamic containment in various operating situations,

equipment maintenance teams, particularly ventilation teams, to train them how they should optimize their intervention actions,

designers and manufacturers of materials and equipment, in particular ventilation equipment, to enable them to experiment and test them with a view to qualification.

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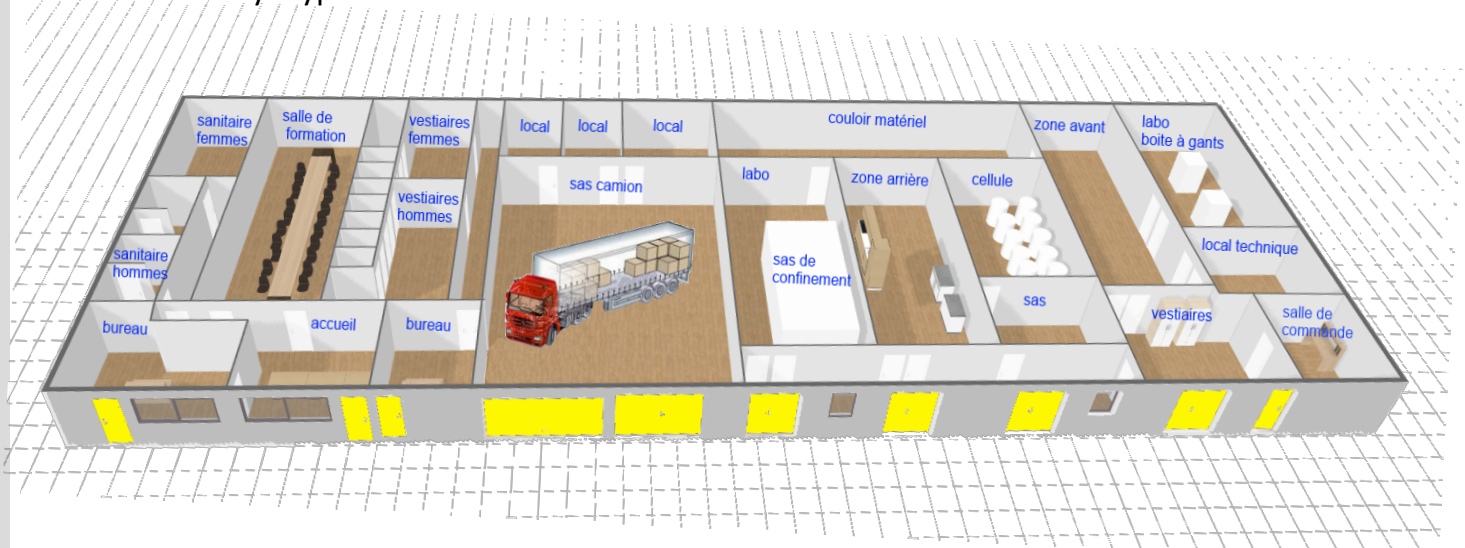
A detailed presentation of the SEIMRIAD Platform

This structure, unique in Europe, is the full-scale reproduction of a Basic Nuclear Facility (BNF) of the "laboratory" type.



- A technical platform of 650m2 equipped with the main features of a basic nuclear installation (BNF): a cloakroom, an airlock for truck delivery and disposal of radioactive materials, laboratories, cells, glove boxes under vacuum, ventilated fume cupboards, benches, radiological controllers.
- A nuclear ventilation system of environment and process reproduces the confined atmosphere of an BNF and offers the possibility for an exercise in real situations of dealing with the dilemma of its maintenance.
- An aeraulic loop of tests functioning in pressure and under pressure (Beatrice).
- A fully computerized control and piloting room for the ventilation. Ventilation management is programmable to inject incident scenarios.
- Special areas dedicated to the training and reception of the intervening teams (an air-conditioned training room equipped with a video projector, offices, changing rooms, sanitary facilities...)




This platform also reproduces the intervention difficulties encountered in the field: complicated pathways, thick walls preventing the propagation of radio waves, ventilation equipment, nuclear materials in transit in the truck airlocks....
From a computerized control room, incident scenarios can thus be run with maximum realism. Such an advantage allows not only specialized intervention teams to train together, but also helps crisis management teams to improve their decision-making skills in complex situations.

SEIMIRAD will also be a monitoring and research center in the fields of security and safety in technical, human, operational and managerial aspects.

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Service and Partnership Offers

- Engineering Training,
- Training à la carte adapted to specific needs,
- Availability of the platform, with a technical support staff, on a case-by-case basis, for training or equipment testing,
- Shared training partnership.
- The services offered by the CEA are subject to confidentiality agreements and thereby provide every guarantee to manufacturers, in particular equipment designers or manufacturers who wish to test their equipment on SEIMIRAD.

Competence and skills, expertise, know-how of the CEA Cadarache Research Center in terms of safety, security and radioprotection

Apart from their regulatory missions of monitoring site access and security, radiation exposure levels of personnel and premises, releases into the environment and the medical surveillance of employees, the teams of the Department of Security Services (D2S), the center's main support for crisis management, must always be trained and operational in order to ensure effective and quality interventions, all the more difficult to carry out in that they are often truly exceptional.

To accomplish this, the D2S teams have a range of skills and expertise (security guards, firefighters, dog handlers, doctors, nurses, biologists, radiation protectionists, radiochemists, measurement specialists, etc.) but they are complementary, especially when they must work together on an intervention. They must be trained and prepared at all times to respond 7 days a week, 24 hours a day, to events that are always possible (accidents, intrusions, fire, illnesses, etc.), whether on alert or at the request of the center's management.

In addition to this, the Facilities and Packaging Projects Department (DPIE) hosts the "containment-ventilation" competence unit. Its main missions consist in providing technical support for the facilities and projects for dynamic containment safety analyses, the implementation of technical provisions associated with ventilation systems, participation in the development of the CEA safety doctrine on containment-ventilation, improvement of the consistency of safety demonstrations and the development and evaluation of tools and technical solutions.

This operational unit benefits from the resources of its location (documentation, framework contract, test and measurement equipment) and from the privileged contacts of its team with nuclear facility operators: manufacturers (engineering, ventilation design offices, equipment suppliers) and specialized research laboratories. In this context, SEIMIRAD represents a structure of choice that contributes to the development and qualification of new equipment or new methods as well as training.

The means implemented to allow the proper accomplishment of these missions are adapted, maintained and optimized. They use the latest technologies to minimize the consequences of an event, or even to prevent it from occurring by intervening as early as possible.

The various approvals issued upstream by the supervisory authorities demonstrate the confidence placed in the DPIE and the D2S teams.

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Our strong points:

- 59 Training programs;
- Major exercises conducted with the Public Security Forces (SDIS, Gendarmerie, Police

They rely on us:

Our partners:

On security issues, CEA Cadarache works in partnership with (subject to their agreement to be quoted):

- The SAFE CLUSTER Technology Unit
- Cofely
- BSPP,
- The SDIS
- The CNCMFE (The National Civil and Military Training Center NRBC-E)
- The French Army (Radiological Protection Service of the Armed Forces),
- The Ecole des Mines d'ALES,
- CNAM Paris
- The AMU (The Aix-Marseille University)
- The Toulon Arsenal

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