



**IRSN**

INSTITUT  
DE RADIOPROTECTION  
ET DE SÛRETÉ NUCLÉAIRE

*Enhancing nuclear safety*

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# Key Facts 2018

MEMBER OF

**ETSON**

EUROPEAN  
TECHNICAL SAFETY  
ORGANISATIONS  
NETWORK

# SCIENTIFIC KNOWLEDGE IS AT THE HEART OF IRSN'S ACTION

Every day, IRSN advances its expertise in nuclear and radiological risks by means of research and experience feedback. Research accounts for more than 39.1 % of IRSN's budget. It relies on the quality of the women and men working at IRSN, the many different disciplines they cover and their skills, reinforced by a knowledge management and training system that enables IRSN to capitalise on and transmit its knowledge internally. IRSN's openness, through scientific partnerships in France and abroad, also plays a key role in enriching scientific knowledge.

IRSN is thus a driving force in European research platforms and in many international programs.

To develop its expertise in the long term and ensure it focuses on areas that deliver the most progress, IRSN has developed a 10-year scientific strategy, following wide consultation with its research governing bodies, research policy committee and scientific council.

## 2018 NEWS

- **Evaluation of IRSN by Hcéres.**
- **Participation in research projects launched by the NEA (OECD) on dismantling the damaged Fukushima-Daiichi reactors.**
- **Success of the first test in the CABRI experimental reactor with a pressurized water loop for the CIP program.**
- **Tournemire: a laboratory for acquiring methodological and phenomenological knowledge of clay to help with assessing the risks of deep geological disposal.**
- **PARISII: a research platform on the effects of chronic intake of radioactive substances.**



### > INTELLECTUAL PROPERTY

**31**

French patents in force  
(including 4 co-owned)  
(28 including 8 co-owned  
in 2017)

**63**

patents in force  
abroad  
(59 in 2017)

**29**

software applications and databases  
registered with the software  
protection agency APP  
(including 7 co-owned)  
(28 including 7 co-owned in 2017)



### > TRAINING

**1,840**

hours of teaching given outside the Institute  
(universities, engineering schools, INSTN, etc.)  
(1,650 in 2017)

• **576**

hours of teaching given  
in 17 training sessions  
on radiation protection  
(744 in 2017)

• **161**

hours of teaching given  
in 8 training sessions  
on nuclear safety  
(126 in 2017)

**€1.29 M**

spent on training  
(€1.32 M in 2017)

# IRSN ASSESSES NUCLEAR AND RADIOLOGICAL RISKS IN COMPLETE INDEPENDENCE

The quality of IRSN's assessments relies on the competence of its experts, proven assessment methods and constant improvement of its knowledge of the risks, achieved mainly through its research. In-depth assessments are conducted by IRSN using a method based on scientific and technical knowledge, combining the work of experts with experiments and simulations (experience feedback analysis, report analysis, modelling, experimentation, etc.).

IRSN's approach to assessment is based on critical analysis and a comparative and collective scientific and technical reflection and assessment construction process, which is multidisciplinary and includes dialogue with civil society and stakeholders. It is strictly governed by code of ethics, which also regulates conflicts of interest, and relies on a certified quality management system.

## 2018 NEWS

- Main orientations of the Performance Target Agreement 2019-2023.
- Fourth periodic review of 900 MW reactors.
- Review of the safety options report for a central storage pool for spent fuel.
- Development of an expert system in the field of fire risk.
- Progress monitoring of the EPR construction at Flamanville.
- Review of the security options for the EPR NM.
- Enhanced skills in cybersecurity
- Expert assessment of the seismic failure of emergency generators at 1300 MW reactors
- Quality management: ISO 9001v2015 certification.



### > TECHNICAL SUPPORT FOR PUBLIC AUTHORITIES

**51%**  
budget spend on technical support and public service missions (excluding Feurs project)  
(50.7% in 2017)

- 104 technical notices submitted to the MTES Senior Defence and Security Official (99 in 2017)
- 551 technical notices and reports submitted to ASN (536 in 2017)
- 97 technical notices submitted to the Euratom Technical Committee and to the MTES Senior Defence and Security Official (118 in 2017)
- 71 technical notices submitted to ASND (62 in 2017)

### > RESEARCH

**39.1%**  
budget spend on research (excluding Feurs project)  
(39.8% in 2017)

- 442 scientific lectures at conferences (395 in 2017)
- 262 publications listed in the JCR (Journal Citation Reports) (209 in 2017)
- 28 theses defended (26 in 2017)

# IRSN'S ACTION TO PROTECT THE PUBLIC AND THE ENVIRONMENT IS BROAD IN ITS SCOPE

IRSN handles all scientific and technical issues related to nuclear and radiological risks posed by facilities or activities (industrial, medical or research), whether in terms of prevention in normal situations or impact mitigation in accident situations, making recommendations for action. Its expert assessment and research activities cover:

- the safety and security of nuclear reactors, plants, laboratories, transport and waste;
- protection of human health against ionising radiation, particularly due to medical exposure;
- environmental monitoring;

- protection of facilities and means of transport handling radioactive and fissile materials from malicious acts.

IRSN is also responsible for keeping the public informed about ionising radiation and its effects, and for developing better knowledge and a safety culture. For this reason, IRSN offers numerous training courses for professionals.

## 2018 NEWS

- **Work on contaminated sites: collector's apartment in Orléans, watchmaking workshop in Morteau, etc.**
- **Detection in October 2017 of ruthenium-106 in Europe: results of IRSN's investigations.**
- **Contribution to the European Metroradon project, a research project to measure low radon concentrations.**
- **Local and regional actions related to radon.**
- **Report on scanners and radiation protection in medical imaging.**
- **First results of the ÉPICE study launched in the wake of the Chernobyl accident.**
- **IRSN modernizes its facilities for analysing environmental samples.**



### > ASSESSMENTS

**823**

technical notices and reports submitted to the civil and military safety and security authorities

**556**

whole-body radiation counts performed for worker monitoring, including 341 using mobile equipment

**479**

radiation monitors (including 425 fixed Teleray stations)

**114**

national inspections relative to protection and control of radioactive materials



### > INTERNATIONAL

**205**

bilateral cooperation agreements signed with research and assessment organisations (214 in 2017)

- **48** countries involved in these agreements (52 in 2017)
- **47** international projects in progress overseen by the OECD-NEA, the European Commission or the ANR (54 in 2017)
- **9** projects of which IRSN is coordinator (14 in 2017)

# IRSN IS A MAJOR PUBLIC PLAYER IN FRANCE AND WORLDWIDE

IRSN is a contributor to national policy on health, nuclear safety, the environment and emergency response, and plays a major role in international dialogue, particularly through the involvement of its experts in international bodies responsible for nuclear governance.

The 2015 Act on energy transition and its implementing decree consolidated IRSN's major role in the national safety and radiation protection system.

The Act underlines the importance of scientific and technical knowledge in managing risks, and reaffirms the independence of safety and radiation protection research and expertise, as well as transparency and public information on nuclear and radiological risks, in particular with the publication of the notices issued by IRSN for the public authorities.

## 2018 NEWS

- Close collaboration with the IAEA: contribution to TECDOC 1835 and the first symposium on communication in nuclear or radiological emergencies.
- Very active contribution to the ETSO network.
- The Viktoria Loop (a facility located in Slovakia), setting an example for cooperation in nuclear safety.
- IRSN, a partner of the US Department of Energy on criticality.
- Extension of the partnership with China.
- Enhanced cooperation with Japan.
- Eleventh international radiation protection workshops in schools.



## > DISSEMINATION OF KNOWLEDGE

**3,810,534**

pages viewed on IRSN's website  
(2,896,291 in 2017)

- 334 notices and reports published on IRSN's website (402 in 2017)
- 157,755 pages viewed in the 'Research' section (formerly the 'Scientific site') of IRSN's website (153,825 in 2017)
- 50 requests for IRSN action received from local information commissions (40 in 2017)
- 6 titles published by IRSN (3 in 2017)
- 115 students from French and foreign schools took part in the radiation protection workshops in schools initiative (114 in 2017)
- 14 IRSN operations at local information commissions (15 in 2017)

## BUDGET BREAKDOWN



# €277 M

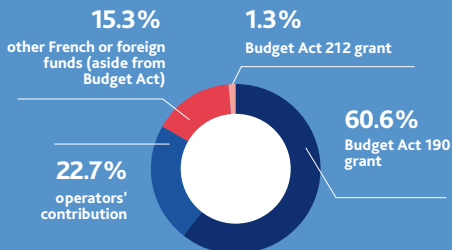
in revenues  
(€266 M in 2017)



# €274 M

in expenditure,  
including €15 m of equipment investment  
(€280 M, including €11 M in 2017)

### > Total funding



#### • Foreign funding

27 %	Riskaudit
19.2 %	EU
17.2 %	Other
8.4 %	Bundesamt Fur Strahlenschutz
6.7 %	Eibir Gemeinnuetzige GMBH
5.7 %	The Government Of Hong Kong
3.4 %	NRC
2.9 %	China Nuclear Power
2.1 %	NRA
2.1 %	GRS

#### • French funding (aside from Budget Act)

46.8 %	Other
22.2 %	EDF
15.6 %	State
7.6 %	CEA
3.9 %	Areva
2.8 %	ENSTTI
1.2 %	ARN

### > Other funds

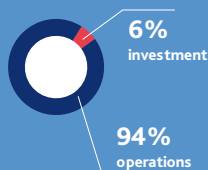
# €37.72 M

French funds

# €4.72 M

foreign funds

### > Operating and investment expenditure



## SERVICES



# €34.6 M

in revenues  
(€32.3 M in 2017)



# 24,846

IRSN customers  
(24,407 in 2017)



# €18.83 M

commercial services  
(€20.36 M in 2017)

- €11.25 M dosimetry (€10.86 M in 2017)
- €0.67 M biological analyses (€0.86 M in 2017)
- €0.73 M Riskaudit (€2.22 M in 2017)
- €1.24 M EDF (€1.50 M in 2017)
- €0.73 M training (€1 M in 2017)
- €4.20 M others (€3.91 M in 2017)

## HUMAN RESOURCES

### > Workforce



**69**

employees recruited  
on permanent contracts

**56**  
employees  
on temporary  
assignments  
(60 in 2017)

**22**  
employees  
on secondment  
(21 in 2017)



**1,777**

employees  
(1,800 in 2017)

**1,636**  
permanent  
employees  
(1,655 in 2017)

**141**  
employees on fixed  
term contracts  
(145 in 2017)



**49**

doctors or  
persons qualified  
to direct research  
(47 in 2017)



**76**

doctoral students  
(81 in 2017)

**10**

post-docs  
(6 in 2017)

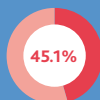


**44,050**

hours of training delivered  
to maintain skills  
(43,109 in 2017)



MEN



WOMEN

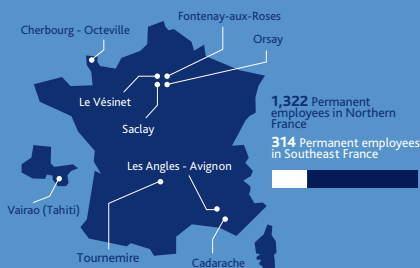


NON-MANAGERIAL



MANAGERIAL

### > Site

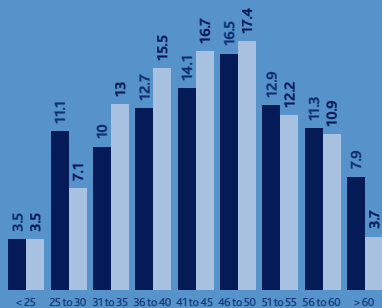


### > Average age

**44** YEARS  
for women

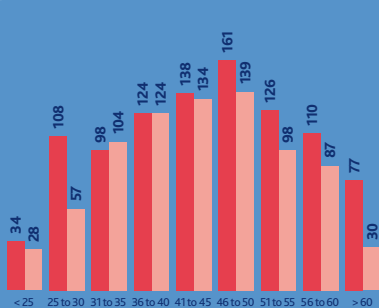
**44.8** YEARS  
for men

### > Distribution of men/women by age group



As % by gender

■ Men ■ Women



Numbers by gender

■ Men ■ Women



- **Best oral presentation,**  
Regroupement Francophone  
pour la Recherche et la Formation  
sur le Béton (RF2B) Science Days,  
Jacques Jabbour
- **'Young Researcher' award,**  
Groupe Français  
de Neurogastroentérologie (GFNG)  
congress, Alexia Lapière
- **Best poster award,**  
Société Française de Radiothérapie  
Oncologique (SFRO), 29<sup>th</sup> Conference,  
Alexia Lapière
- **Best oral presentation,**  
'Microbiote et santé' colloquium,  
Alexia Lapière
- **Jacques Dalla Torre prize,**  
Société Française de Métallurgie  
et de Matériaux (SF2M) 2018  
Materials congress,  
Paul Eyméoud
- **Aguirre-Basualdo prize in economics  
and management, Chancellery  
of Parisian Universities,**  
Marie Kerveillant
- **Young Professional Award  
and Young Professional Public Award,**  
European International Radiation  
Protection Association (IRPA) Congress,  
The Hague Netherlands,  
Nadia Benabdallah
- **PHENIICS Doctoral School Prize**  
for the thesis '*Optimisation  
de la dosimétrie en alphathérapie  
par approche multi-échelle : application  
au traitement des métastases osseuses  
par le Ra-223*',  
Nadia Benabdallah
- **Jean Bricard Prize 2018,**  
Association Française d'Études  
et de Recherches sur les Aérosols  
(Asfera), 31<sup>st</sup> French Aerosols congress  
(CFA 2018),  
Geoffrey Pellerin
- **First prize for presentations  
by young researchers,**  
HEIR 2018 (International Conference  
on the Health Effects of Incorporated  
Radionuclides),  
Manon Jacquemin



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