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# AERONAUTICS

2009

**Airbus, Mirage 2000, Rafale, Falcon—jewels in the crown of the French aviation industry. France's global leadership in aviation is confirmed by the fact that exports represent three-quarters of sales in the sector.**

**The production of aircraft, helicopters, and tactical weapons relies on the skills and capacities of multiple actors: large airframe systems companies for design and production (EADS, Dassault Aviation, Eurocopter), engine makers (Snecma), and manufacturers of equipment and components, from seats to electrical and hydraulic machinery. Once aircraft are put into service, other professions take over: maintenance, airport operations, pilots, and so on.**

**France (and Europe) have an equally high profile in satellites, where Arianespace is the world leader.**

Field: Engineering.
Also see the following profiles: Engineering, Transport and logistics, Environment.

Sectors of activity: aeronautical construction, air transport industry, air navigation control. Operations agent, airline pilot, air traffic controller, flight attendant, aeronautical engineer, engine mechanic, civil aviation technical specialists (research and operations).

## ORGANIZATION OF STUDIES IN FRANCE

The aeronautics and space industry comprises a wide range of activities, from the research engineers who design the aircraft to the skilled workers who fabricate its components, and from the mechanics on the ground to the crew in the air.

### Short programs

Technicians are trained in specialized aeronautics programs, but also in more general programs in mechanics, industrial automation, and electronics. Common degrees are the brevet de technicien supérieur (for example, the BTS in maintenance and operation of aeronautical equipment) and the diplôme universitaire de technologie (for example, the DUT in mechanical engineering and automation). After earning a BTS or DUT, many students pursue a licence professionnelle at a university or enroll in a school of engineering.
The air transport industry employs many thousands of ground personnel with secondary-school and 2-year postsecondary credentials in business or technical fields.

### University programs

France's universities offer a number of specialized programs in aeronautics. Prominent examples include the 2-year diplôme d'études universitaires scientifiques et techniques (DEUST) in aircraft maintenance at the Université d'Evry, 3-year licences professionnelles at many institutions, and professional master's programs at Université Aix-Marseille (all three divisions of the university), Bordeaux 1, Toulouse 3, and Evry, as well as various research masters. These programs can lead to management, engineering, and research positions with aeronautics and space firms, which require highly skilled employees. In fact, about a third of their personnel are engineers and managers. Many work in design, research, and development, conceiving the equipment, components, and production methods of the future.

### Engineering programs

The prestigious diplôme d'ingénieur, a French national diploma, requires 5 years of postsecondary study. Many engineering schools produce talented engineering generalists capable of grappling with complex challenges, such as those posed in aeronautics.
It is possible to enroll in engineering programs directly out of secondary school, after a 2-year postsecondary preparatory program, or after earning a 2-, 3-, or 4-year postsecondary degree. Regardless of the path taken, engineering programs are highly selective.
Five of France's engineering schools specialize in aeronautics and aerospace: ENAC (École nationale de l'aviation civile), which trains airline pilots and other civil aviation specialists; ENSAE/SUPAERO (École nationale supérieure de l'aéronautique et de l'espace), ENSICA (École nationale supérieure d'ingénieurs de constructions aéronautiques), ENSMA (École nationale supérieure de mécanique et d'aérotechnique), and ESTACA (École supérieure des techniques aéronautiques et de construction automobile).
Some schools of general engineering offer an aeronautics option. Examples include the École centrale de Lyon and the École centrale de Paris.

## RESEARCH THEMES

Tough problems confront the aeronautical sector—chief among them the unstable price of fuel (around a long-term upward trend), shortages of key materials, and the need to reduce pollution.
The sector must do more than cope with the cost of fuel, however. It must also keep up with and strive to get ahead of popular demand to reduce the harmful effects of fuel use (on the climate, for example). Today, efficiency and the abatement of emissions have replaced speed as the principal concern of aeronautical researchers.

## INTERNATIONAL STANDING

Europe's largest airport operator is Aéroports de Paris, which manages the principal Paris airports and employs 11,000 people.
Roissy-Charles-de-Gaulle Airport is France's largest airport and the second-largest in Europe, after London's Heathrow, in number of passengers (56.4 million each year). More than 8,000 people work at the airport.
The Air France–KLM group (104,000 employees) is the world's largest international passenger carrier.

The Airbus A380 was entered into service in 2007, the same year as the Falcon 7X. Seven countries (Belgium, France, Germany, Luxembourg, Spain, Turkey, and the United Kingdom) have come together to finance the development of the A400M. The A350 XWB, notable for its extensive use of composite materials, is scheduled to begin service in 2012.

## Websites

• Centre National de la Recherche Scientifique (CNRS, national center for scientific research), http://www.cnrs.fr
• Centre Français de Recherche Aérospatiale (French center for aerospace research),http://www.onera.fr/
• Centre National d'Études Spatiales (CNES, national space studies center), http://www.cnes.fr/web/CNES-fr/6919-cnes-tout-sur-l-espace.php
• Ministry of Defense,http://www.defense.gouv.fr/
• Ministry of Ecology, Energy, Sustainable Development, and Regional Planning, http://www.developpement-durable.gouv.fr/
• Ministry of Transportation, http://www.transports.equipement.gouv.fr/
• Le Groupement des Industries Françaises Aéronautiques et Spatiales (GIFAS, federation of French aeronautics and space industries), http://www.gifas.asso.fr/fr/
• Fédération Française Aéronautique (French aeronautics federation), http://www.ff-aero.fr/accueil.php
• Civil aviation office , http://www.aviation-civile.gouv.fr/
• Fédération Nationale de l'Aviation Marchande (FNAM, national federation for commercial aviation), http://www.fnam.fr
• Air France, http://www.airfrance.fr/
• Arianespace, http://www.arianespace.com/index/index.asp
• Aérocontac, a Web site for the French-speaking aeronautics and space industry (providing "news and employment opportunities for the aerospace industry, air transportation, and defense"), http://www.aerocontact.com/
• Jobs and training in the aeronautics and space industry, http://www.aeroemploiformation.com
• Nonprofit center for employment and training information, http://www.airemploi.asso.fr
• French government aeronautics information office, http://www.sia.aviation-civile.gouv.fr/
• Espace Aéronautique, a Web site for exchanges among individuals and firms active in the aeronautics industry, http://www.espace-aeronautique.com/francais/index.html
• Aerospace Valley (the global competitiveness cluster of the Midi-Pyrénées and Aquitaine regions),http://www.aerospace-valley.com/

## Key words

aerospace – air – aircraft – airport – airscrews – armaments – artificial intelligence – astrophysics – automation – aviation – composites – computer science – consulting – electromagnetics – electronics – embedded systems – energy – engine – environment – fluid dynamics – fluid mechanics – fuel – helicopter – maintenance – management – materials – mechanical engineering – mechanics – modeling – nanosystems – navigation – operations –optimization – physics – pilot – planetology – propulsion – robotics – space – telecommunications – testing – traffic – traffic control – transport – turbine

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# ENGINEERING

2009

**French engineers have changed the world. They have given their names to the cars we drive (Renault, Citroën), to the tires on those cars (Michelin), and to the famously accurate maps that drivers use (Michelin again). Blériot, one of the pioneers of aviation, was the first to cross the Channel—in a plane of his own design. Dassault remains one of the great names in aeronautics—its business jets and military planes are used in 70 countries on 5 continents. Ziegler, responsible for the supersonic Concorde passenger plane, was also one of the chief promoters of Airbus, the European aircraft builder. Eiffel of the eponymous tower, but also engineer of the Statue of Liberty, and Lesseps, engineer of the Suez Canal between the Mediterranean and the Red Sea, are universally known. Less known is Freyssinet, inventor of prestressed concrete, although the group that bears his name is the world's leading specialist in civil engineering, active in more than 60 countries. In optics, we have Angénieux to thank for the wide angle lens and the auto-focusing zoom. His precision lenses have been indispensable for NASA's space missions, for defense systems, and for the film industry (Hollywood even gave him an Oscar). Today, the Thales Angénieux Group is also a leader in medical equipment. Philosopher and engineer Henri Poincaré was another optical genius, but that did not keep him from making key advances in infinitesimal calculus, chaos theory, and relativity theory. Information technology makes heavy use of Bézier curves, named for the mechanical and electrical engineer. The list is endless.**

**Subfields** :
Aeronautics, agriculture, agronomy, biotechnology, chemistry, electricity, electronics, energy, environment, civil engineering, production management, manufacturing, engineering, materials, mechanics, offshore operations, safety and security, quality management, telecommunications.
Also see the following subject profiles: Computer science, Management, Human resource management, Public administration

**Sectors of activity** :
research and development, engineering, technical research and consulting, project and program management, production, operations, maintenance, testing, quality assurance, security, information systems, customer relations (marketing, sales, support), administration and management, human resources, education and research.

Globalization, the imperative of sustainable development, the challenges of managing natural resources and energy: Engineers are playing key roles in finding solutions to these complex problems and others, equally complex, that loom on the horizon.
Degree programs in engineering are shaped by advances in science and technology, by the diversification of the labor market, and by the changing needs of employers and society at large. Because the engineering profession is practiced within an evolving context, it, too, must evolve.
At the most basic level, engineers pose a problem and then find ever-better solutions to it. Typically, their challenges lie in the design, manufacture, and use of products, systems, and services within competitive organizations. Sometimes those challenges extend to financing and commercialization as well. To rise to the task, engineers must combine technical, economic, and social knowledge and skills, all rooted in a solid scientific foundation. Today, more than ever, engineers are organizers, coordinators, and managers of complex projects.
Engineers pursue their craft in manufacturing, public works, agriculture, and the service sector. That craft mobilizes people, technology, and finance, often on an international scale. Engineering projects must heed economic signals and respect social norms, notably in the realms of health, safety, and environmental protection.

## ORGANIZATION OF STUDIES IN FRANCE

The diplôme d'ingénieur is a credential regulated by CTI (Commission des Titres d'Ingénieur), the French national commission on engineering degrees. In 2008, CTI authorized 240 schools to deliver the degree, which is equivalent to a master in the harmonized European degree system defined in the Bologna Treaty.
Altogether, France's schools of engineering produce some 30,000 new engineers each year.
Engineering programs have four essential components:
- A common core of basic scientific knowledge equips graduate engineers to approach problems with analytical rigor and enables them to adapt over time to the changing demands of the profession.
-A grounding in the scientific foundations of engineering enables young engineers to perform well on a wide variety of professional tasks.
- Exposure to the business world, and to the environmental, economic, social, ethical, and philosophical aspects of their profession, helps engineering students to be better engineers and managers.

- Training in communication and cross-cultural experience—a part of which is the acquisition of proficiency in English—enables graduate engineers to practice effectively anywhere in the world.

The diplôme d'ingénieur represents 10 semesters of postsecondary study, or 300 credits under the European Credit Transfer Scheme. The first 4 semesters are devoted to a preparatory curriculum that may be completed externally—many élite secondary schools in France offer the curriculum—or internally, if the engineering school has an integrated preparatory program. Once students are admitted, their curriculum is determined by the school, although up to half of students' time may be spent outside the school in internships. France's schools of engineering welcome international students so as to promote intercultural exchange, to encourage French students to get to know the outside world, and to respond to the needs of large multinational companies.
The recruitment of international students is just one of the ways that engineering programs have adapted to demand from employers. Enrollments of female students have grown as well, particularly in public schools. In 2004, some 25,300 women were enrolled in the nation's schools of engineering, representing a quarter of total enrollments, up from a fifth in 1990. The share of women varies widely depending on the type of school.
Almost half (46 percent) of engineering students spent their first 2 years in the special preparatory classes described above. But a growing share of students is admitted after earning a 2-year degree from a university-based institute of technology (IUT) or an STS program.

Source: Ministry of National Education, 2006,
http://media.education.gouv.fr/file/84/7/1847.pdf.

### Other degrees in engineering: the specialized master

As noted, the diplôme d'ingénieur is a national diploma, regulated by a national commission. But other degrees in engineering, specific to the institution that grants them, are available as well. The mastère spécialisé, introduced in 1986, allows graduate engineers to devote an additional 2 semesters to specialized study. The sixth-year credential, highly valued by employers in many fields, comes with a high price tag as well: between €7,000 and €15,000 for the 2 semesters. Many factors contribute to the success of the 1-year specialization—chief among them small classes, individualized instruction, a diverse and expert faculty (consisting of academics and scientists, executives and managers, engineers), close attention to the demands of the market, and cross-disciplinary approaches to teaching. The latter are exemplified by partnerships between engineering schools and business schools, such as the partnership of the École des Mines de Paris, Télécom Paris, SUPAERO, and HEC. Some 45,000 graduate engineers have elected to earn a specialized master since the degree was introduced two decades ago. The 90 member schools of the Conférence des Grandes Écoles offer 350 different specialized masters.

## INTERNATIONAL STANDING

The study of engineering carries great prestige in France. Successful students earn the diplôme d'ingénieur, a professional credential that is equivalent to a European master's degree representing 300 ECTS credits.
The unique features of engineering education in France bear repeating:
* Students receive rigorous training in advanced mathematics and science. Practical applications are dealt with separately in small sections, lab sessions, workshops, and internships.
* Students are required to demonstrate their capacity to reason and to explain their reasoning. The way in which students arrive at a result is valued at least as much as the result itself. Students must be able to "audit" their own thinking.
* Internships with firms are an integral part of the engineering program. Internships allow students to refine their interpersonal skills and capacity for flexibility and adaptation, thereby preparing them for professional life.

Source: n+i Network of engineering schools.

## Websites

• Eiffel excellence grants
http://www.egide.asso.fr/fr/programmes/eiffel
• Commission on engineering degrees : http://www.cti-commission.fr/
• CDEFI, the Conference of Directors of French Engineering Schools, the association of schools authorized to confer the title of graduate engineer
http://www.cdefi.fr
• French national council of engineers and scientists
http://www.cnisf.org/
• Information on engineering studies in France :
http://www.cefi.org
• List of schools of engineering
http://media.education.gouv.fr/file/44/0/4440.pdf
• Another list of schools of engineering
http://www.recherche.gouv.fr/cid20256/liste-des-ecoles-d-ingenieurs.html
• ParisTech (formally the Institute of Sciences and Technologies) offers instruction in all aspects of science and technology, making it the functional equivalent of a university of international scope. Each of ParisTech's member schools is widely acknowledged to be the best in France in its field. The members therefore complement each other, penetrating into nearly every corner of the engineering sciences. The size and quality of the faculty and the full range of scientific disciplines represented give ParisTech a stature comparable to that of the world's great scientific and technical universities, for any of which ParisTech could be a suitable partner. In fact, it is in the initiation of international projects that ParisTech's member schools are proving their ability to act collectively : http://www.paristech.org
• PolyTech is the national network of university-affiliated engineering polytechnics. The 11 member polytechnics are all public and charge university tuition. Their degrees are accredited by CTI, the French national commission on engineering degrees. The university-based polytechnics were formed through the merger of individual schools of engineering; the merged institutions now operate within a university setting. The chief purpose of the PolyTech network is to increase the national and international visibility and effectiveness of France's university-based engineering programs : http://www.polytech-reseau.org/
• The n+i Network of engineering schools represents 70 French engineering schools in the recruitment and admission of international students. The Network manages the allocation of students among schools (in accordance with student preferences and each institution's admission standards); the marketing of special programs of language learning, academic preparation, and cultural adjustment; orientation programs for arriving students; and financial aid programs funded by corporate employers and regional governments. It also collects international students' payments for tuition and related services : http://www.nplusi.com
• Conférence des Grandes Écoles, the association of France's grandes écoles:
http://www.cge.asso.fr
• Dissertations in progress in the grandes écoles
http://www.cge.asso.fr/cadre_liens.html

## Keywords

administration – aeronautics – aerospace – air – architecture – armaments – astrophysics – automobile – aviation – bio-imaging – biology – civil engineering – client – climate – commercial – communication – computer science – consultant – customer relations – design – development – Earth – economics – electricity – electronics – energy – engineering – entreprise – environment – fluids – globalization – human resources – imaging – industry – information systems – engineering – insurance – Internet – land-use planning – law – logistics – maintenance – management – marketing – materials – mathematics – mechanics – modeling – nanotechnologies – naval engineering – navigation – networks – nuclear – offshore – oil and gas – operations – optics – organization – physics – planets – policy – production – propulsion – quality – renewable energy – research – robotics – safety – sciences – security – technical consulting – technology – telecommunications – testing – training – transportation

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# NEW MATERIALS

2009

**The 1970s saw the emergence of new materials: macromaterials (complex composites) first of all, and then nanomaterials (artificial structures at molecular level). Relative to traditional materials, they offered multiple advantages in terms of reliability, longevity, precision and lightness. The nanomaterials soon made their entry into nearly all the industrial fields, including aeronautics (Airbus 380) and aerospace, automobile manufacture, the medical sector, electrical and electronic construction and even musical instruments. Notwithstanding the revolutionary promise of the miniaturisation race, however, the new materials have not yet been adequately recycled because of the costs involved and the very number and complexity of their components. But these developments are also opening up an enormous market as laboratories and research departments recruit research engineers with diplomas from elite schools specialised in materials or PhDs in physical science, solid-state physics or materials science. France, which is one of the leaders in the exploration of nanosystems (along with the United States, Japan and Germany), is investing in research and wants to attract high-level students. Grenoble, for example, can pride itself on being the European centre for microand nanotechnologies with LETI (applied research laboratory in electronics), which has been working for many years on silicium technology for microelectronics. MINATEC (Centre for Innovation in Micro- and Nanotechnology, which has grown out of increased co-operation between LETI and the Institut National Polytechnique in Grenoble) is scheduled to host some 3,500 researchers and technicians as of 2006.**

See the data sheets on “Engineering”, “Environment” and “Sustainable development” as well.

## RESEARCH UNITS

- LAAS (Toulouse, CNRS) Laboratory for Systems Analysis and Architecture
http://www.insa-toulouse.fr
- LETI-CEA (Grenoble, Atomic Energy Commission) Laboratory of Electronics and Information Technology
http://www-leti.cea.fr
- IMP Jean Rouxel Materials Institute (institute for materials, materials engineering, and process engineering)
http://www.cnrs-imn.fr
- IEF (Orsay) Institute of Basic Electronics
http://www.u-psud.fr/ief
- LPH (Marcoussis, CNRS) Laboratory of the Physics of Nanostructures
http://www.lpn.cnrs.fr
- INPG : http://www.grenoble-inp.fr
- INPL (including EEIGM : European School of Materials Engineering
http://www.inpl-nancy.fr
- INPT
http://www.inp-toulouse.fr
- Research themes at CEA
http://www-instn.cea.fr/rubrique.php3?id_rubrique=65

## Keywords

- The « n+i » network offers many programs in materials
http://www.nplusi.com .
- Paris Tech unites 10 schools of engineering and 143 research laboratories
http://www.paristech.fr/fr/etudier_doctorat.html
- The « n+i » network offers many programs in materials
http://www.nplusi.com
- An informational brochure on nanosciences produced by the Ministry of Research
http://www.nanomicro.recherche.gouv.fr
- A database of individuals and institutions active in the field of nanomaterials in France
http://www.nanomateriaux.org
- Pôle MINATEC
http://www.minatec.com
- Ministry of Ecology, Energy, Sustainable Development, and Regional Development
http://www.developpement-durable.gouv.fr
- National Research Agency
http://www.agence-nationale-recherche.fr
- Alfred Kastler Fondation (services for international researchers visiting France)
http://www.fnak.fr
- Bernard Gregory Association (from dissertation to employment)
http://www.abg.asso.fr/

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# THE CIVIL NUCLEAR INDUSTRY

2009

**According to figures provided by the IAEA, France has the second largest national nuclear power industry after the United States, with 58 reactors distributed over 19 sites throughout the country. France is the second largest producer of nuclear electricity in the world (78% of the total electricity produced), and this fact enables it to figure amongst the countries producing the lowest quantities of greenhouse gases (27th of the 30 countries in the OECD in terms of CO2 production in relation to GDP). As a consequence, the French experience constitutes a reference in all of the sectors affecting the civil nuclear industry, namely research and development, construction and maintenance of the installations, and training of the staff (technicians, engineers and researchers, lawyers, etc.).**

**The Atomic Energy Commission (AEC), created in 1945, has been entrusted with the task of performing research and development, up to the industrial stage, regarding all of the processes and methods that are necessary for the production of nuclear electricity. The nuclear sector in France is expert in all of these stages, from upstream extraction of uranium and the manufacture of fuel to downstream management of the fuels used and of the waste materials produced.**

**The main participants in the industrial sector AREVA for the supply of nuclear components and services in the cycle, both upstream and downstream, namely EDF and GDF SUEZ for plant operation, ALSTOM for the conventional parts of the power plants (the turbines), as well as the network of small and medium sized companies and industries in the sector, providing opportunities of high-status employment for any engineers who are interested in the nuclear sector. Organisation of the public sector (apart from the AEC, the ASN and the IRSN for nuclear safety, and the ANDRA for management of the waste products) also supplies employment opportunities.**

## THE NETWORK OF PRINCIPAL TRAINING ENTITIES IN FRANCE

In order to improve the availability of training in relation to the demand by staff in the nuclear sector, a committee for the coordination of training in nuclear science and techniques was created in 2008.

• Paris and Ile de France
– Launch of a Master of Science degree in "Nuclear Energy" (September 2009), programmed over 2 years and taught through English, in a partnership between Université Paris-Sud, ParisTech (Ecole Polytechnique, ENSTA, Chimie Paris, Mines Paris, Ponts et Chaussées, and Arts et Métiers), Ecole Centrale Paris – Supelec, INSTN (Institut des Sciences et Techniques Nucléaires/AEC) and with the support of EDF, AEC, AREVA, and GDF-Suez
– a virtual doubling of the course capacities (100 student engineers) in "Atomic Engineering" of the INSTN. Engineers with more general qualifications are able to specialise here by obtaining an engineering diploma in Atomic Engineering in 1 year.

– Several new programmes on energy in the most renowned engineering colleges of the region (Mines, ENSTA, Ponts, Centrale, Supelec, etc.)
– Creation of complementary training in "Atomic Engineering", at doctorate level, in the form of an international summer school, the first edition of which, in 2007, was a resounding success (70 participants).

• Region Ouest (western region) around the Nantes-Caen-Cherbourg axis
– Nuclear instrumentation (ENSI Caen)
– Nuclear engineering and management of the nuclear waste products at the Nantes Ecole des Mines (start-up in September 2009 of 9 months of courses followed by industrial internship).

• Region Sud-Est (south-east region) covering Grenoble, Montpellier, Aix-Marseille and Valence
– Chemistry for the nuclear industry: Master's degree in CSMP (Separative Chemistry, Materials and Methods - Application to the nuclear fuel cycle) Université Montpellier 2 - Sciences et Techniques du Languedoc
– The physics of reactors: Phelma Grenoble
– Radioprotection: Université Joseph Fourier-Grenoble
– The science of materials: Grenoble INP - Phelma
– Engineering of nuclear power plants: Grenoble INP - Ense3
– Plant dismantling and waste products:Université Joseph Fourier-Grenoble
– Instrumentation: Université de Provence (Marseille)
– Nuclear safety: ENSAM Aix-en-Provence
– Nuclear engineering and civil engineering: INSA Lyon

Other higher education establishments in France also provide training courses in response to the needs of the nuclear sector, at Bac+5 level, in the form of options in engineering colleges, which can be taken after a preparatory class in higher or special mathematics, or a masters degree in one of the universities.

## RESEARCH THEMES

The strategic positioning of the AEC is structured around three research axes, namely:
- energy generation that does not emit greenhouse gases, including nuclear, this being its historical role,
- the information and health technologies,
- general defence and security

In these three areas which are essential to the country, the AEC plays a key role by ensuring a good collaboration between research, innovation and industry, which represent a generator economic development and a creator of jobs.

Alongside these three main axes, and the fundamental research base that supports them, the AEC also very often performs, jointly with the CNRS and the Universities, a mission of design, construction and operation of very large installations for the benefit of the national, European, and international scientific community (such as Synchrotron Soleil, Institut de Chimie Separative de Marcoule, ITER Cadarache site for controlled fusion and Neurospin on the Saclay site for cerebral imaging by magnetic resonance).

## INTERNATIONAL STANDING

The following are some examples:
-The European Union, the United States, Russia, Japan, China, South Korea and India are all collaborating in the ITER project, which is a long-term programme designed to study controlled nuclear fusion. Its objective is the construction and experimental operation of a magnetic containment chamber that is intended to control a plasma in order to study the possibility of energy production by nuclear fusion. The installation will be built at Cadarache in France.
- The countries to which France exports nuclear products, namely China, South Korea, Brazil, South Africa, and Europe. The industrial contracts in this type of export market are always accompanied by an offer of training for the construction and operating phases.

## Websites

• Training in nuclear engineering at the ONISEP site
http://www.onisep.fr
• The Atomic Energy Commission - AEC
http://www.cea.fr/
• The Nuclear Energy Agency of the Organisation for Economic Co-operation and Development - OECD
http://www.nea.fr/
• The site of the International Atomic Energy Agency - IAEA
http://www.iaea.org/
• The French Nuclear Energy Society:
http://www.sfen.org/
• The INSTN ( Institut National des Sciences et Techniques Nucléaires)
http://www-instn.cea.fr/
• The AREVA company
http://www.areva.com/
• The EDF company – Foundation for the Energies of the Future
http://www.energiesdedemain.com

## Key words

IAEA - AREVA - sanitation/disposal in nuclear installations - astrophysics - AEC - nuclear power plants - separative chemistry - containment - nuclear waste products - civil engineering in nuclear installations - EDF - electricity - nuclear energy - environment - fission - fusion - neuroscience - optics - physics - plutonium - radioactivity - radiobiology - radiopathology - radiation - nuclear reactors - reprocessing of waste products - SFEN - nuclear safety - toxicology - uranium