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NUCLEAR LEGISLATION IN OECD COUNTRIES

Regulatory and Institutional Framework for Nuclear Activities

Switzerland

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally friendly and economical use of nuclear energy for peaceful purposes, as well as
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In these and related tasks, the NEA works in close collaboration with the International Atomic Energy Agency in Vienna, with which it has a Co-operation Agreement, as well as with other international organisations in the nuclear field.

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SWITZERLAND

This chapter was last revised in 2003 and is correct as of that date.

The NEA Secretariat is currently revising this chapter in close consultation with the national authorities and plans to issue a new version in the near future.

SWITZERLAND

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I. GENERAL REGULATORY REGIME

1. Introduction

It was in 1946 that the peaceful use of nuclear energy was first regulated by the Swiss Confederation in the form of a Federal Order, dated 18 December 1946, encouraging research in the field of nuclear energy.

Given the complexity of the issues raised by the use of nuclear technology and the fact that large sums of money are required to put it into effect, the federal parliament in June 1957 authorised an amendment to the Constitution [Article 24 quinquies] so that nuclear legislation should fall within the sole jurisdiction of the Confederation, and this was approved in a referendum and by all the cantons in November 1957. Cantons, therefore, are not responsible for nuclear safety questions and have a residual jurisdiction only with regard to the licensing of nuclear installations (building permits, mining legislation, fire permits, water samples and use, etc.). This division of jurisdiction between federal and cantonal authorities was sanctioned at federal tribunal level in decisions of 18 August 1973 and 23 March 1977.

In Switzerland, the development and use of nuclear energy is not a state monopoly, and a large place is left to private industry. The first commercial nuclear power plant was brought into service in 1969. Many local authorities, however, have a direct or indirect interest in the operation of nuclear installations. There are at present five nuclear power reactors located on four sites with a total capacity of 3220 MWe: Beznau-1 and Beznau-2 are located at Döttingen, Goesgen is at Soleure, Leibstadt in Aargau and Muehleberg at Bern. Nuclear energy electricity represents almost 40% of electricity annually produced in the country. In addition, Switzerland operates three nuclear research reactors located at the Institute of Physics of the University of Bale, the Institute for Applied Radiophysics of the University of Lausanne, and the Paul-Scherrer Institute.

It should also be noted that referenda on nuclear energy were held on 22 and 23 September 1990. The Swiss population and the cantons had to take a decision on three questions of major importance for the country's energy policy: a public motion, as set out in the Constitution, calling for the progressive and final abandonment of nuclear energy (rejected by a 52.9% majority); a public motion calling for a ten-year moratorium on the construction of all new nuclear power plants accepted by a 54.6% majority); and a government proposal to amend the Constitution in order to give the Confederation authority to promote energy savings (accepted by a 71% majority). The cantons unanimously accepted the constitutional article on energy, while a majority of cantons decided in favour of the moratorium and against abandonment. Following a further referendum held on 18 May 2003, the population and the cantons rejected two popular constitutional initiatives called "Moratorium Plus" ("*Moratoire Plus*") and "Phase-out Nuclear" ("*Sortir du nucléaire*"). On the same day, the Swiss population accepted the new Act on Nuclear Energy of 21 March 2003, presented by the government as a counter-proposal to the two initiatives.

Nuclear legislation in Switzerland will be essentially based until 31 December 2004 (this date is still provisional) on a federal act, the Act of 23 December 1959 on the Peaceful Use of Atomic Energy and Protection Against Radiation. On 21 March 2003, the Federal Assembly (the Swiss parliament) adopted a new Federal Act on Nuclear Energy. This act should enter into force on 1 January 2005, at the same time as its implementing ordinance, which is currently being drafted. As soon as it enters into force, the new act will replace the current 1959 Atomic Act as amended, as well as the Federal Order of 1978. Likewise, the new Ordinance on Nuclear Energy will replace, among others, the current implementing Ordinance of 18 January 1984 amended on several occasions. The Swiss atomic legislation needed to be amended in order to centralise some elements contained in several ordinances of the Federal Council (decommissioning of nuclear installations, disposal of radioactive waste and financing of such activities) and to introduce new elements (obligations to be complied with by operators of nuclear installations, adaptation of licensing procedures and reprocessing of radioactive waste). The new act maintains the nuclear energy option: the construction of new nuclear plants will remain possible, as long as the most recent technology is used; however, a decision in principle of the parliament will be necessary in respect of new nuclear installations, and is subject to an optional referendum.

Within this study, we have retained certain references to the 1959 Act and the 1978 Federal Order as well as to their joint implementing Ordinance of 18 January 1984, pending the entry into force of the new legislation.

2. Mining Regime

There are no special mining regulations in Switzerland relating to nuclear ores.

At present, nuclear ores (uranium and thorium) are not considered as nuclear fuels within the meaning of the Ordinance of 18 January 1984 on definitions and licences in the field of atomic energy [Section 1]. However, this ordinance will be repealed with the entry into force of the new Ordinance on Nuclear Energy.

3. Radioactive Substances, Nuclear Fuel and Equipment

Given the special properties and possible uses of nuclear fuels, current Swiss nuclear legislation contains more detailed rules with regard to them than to other radioactive substances.

The Act of 21 March 2003 simplifies the categories of radioactive substances. In this context, “nuclear fuel” does not exist any more as a distinct category. In addition to “nuclear waste”, the act identifies the three following sub-categories within the general category of “nuclear articles” [Section 3]:

- nuclear materials, which include substances which may be used to produce energy from the fission of the nucleus of an atom;
- components and equipment intended or necessary for the use of nuclear energy;
- the technology necessary for the development, production or use of the materials, components and equipment intended or necessary for the use of nuclear energy.

a) Nuclear fuels

The regime described herein will be amended with the entry into force of the Act of 21 March 2003 and its implementing ordinances, as the Federal Act of 23 December 1959 and several ordinances including the Federal Council Ordinance of 18 January 1984 on definitions and licences in the field of atomic energy will be repealed.

The Federal Act of 23 December 1959 on Atomic Energy already contained the basic provisions as to the possession and use of nuclear fuels (and residues). Their import and export is governed by the Federal Council Ordinance of 18 January 1984 on definitions and licences in the atomic energy field. However, these provisions do not apply to source materials which are not used to produce energy, to special fissile materials whose level of radioactivity does not exceed 1 000 kilobecquerels (1 kilobecquerel = 0.027 microcuries) or to uranium-bearing ores, these being governed by the Act of 22 March 1991 and the Ordinance of 22 June 1994 on radiation protection.

The possession, transport, import and export of nuclear fuels are subject to licensing by the Confederation [Act of 23 December 1959, Section 4]. The Federal Energy Office is the body competent to deal with licensing applications [Ordinance of 18 January 1984, Section 9]. It grants licences on the advice of the Principal Division for the Safety of Nuclear Installations (*Direction principale de la sécurité des installations nucléaires* – DSN). It is also the DSN which certifies that the international regulations on the transport of dangerous goods have been complied with. In accordance with the Ordinance of 18 January 1984, any proposed export of sensitive nuclear equipment or products is considered in the light of the London Club guidelines on nuclear transfers, subject to the provisions relating to the transfer of nuclear technology, and is submitted to the Federal Energy Office and the Secretariat of State for the Economy (*Secrétariat d'*).

The revocation of a licence to possess nuclear fuels results in a transfer of the nuclear materials either to another licence-holder or to the Confederation [Act of 23 December 1959, Section 9]. If necessary, the Confederation may arrange for such materials to be seized at the expense of the person whose licence has been revoked [Section 39].

The possession of nuclear fuels is subject to supervision by the Confederation, to which end the Confederation or any bodies designated by it may take all necessary steps to protect persons, property and important rights. In practice, supervision is mainly carried out by the principal Nuclear Safety Division of the Federal Energy Office. The Federal Council has the general task, in the context of the possession and use of nuclear fuels, of laying down implementation standards and setting up any necessary bodies [Act of 22 May 1991 on Radiation Protection, Sections 37.1a.1 and 38]. The Act of 21 March 2003 establishes a ten-year moratorium on the reprocessing of spent nuclear fuel as from 1 July 2006. Until then, operators may continue to honour their contracts with French or English reprocessing firms. The ten-year moratorium may be extended for a further period of ten years by the parliament [Act of 21 March 2003, Sections 9 and 106, paragraph 4].

b) Radioactive substances and equipment generating ionising radiation

The Radiation Protection Ordinance of 22 June 1994 contains provisions regulating substances, objects and waste with a level of activity, concentration, contamination, dose rate or mass in excess of the values listed in the Annex. The licensing authorities are the Federal Office of Public Health (*Office fédéral de la santé publique* – OFSP) and, for activities performed in nuclear installations and for tests using radioactive substances in the framework of preparatory measures as defined in the Federal Order

of 6 October 1978 concerning the Atomic Energy Act, the Federal Energy Office (*Office fédéral de l'énergie* – OFEN).

The OFEN grants licences for: activities performed in nuclear installations; activities performed in the Paul-Scherrer Institute (IPS) in Villigen which do not involve the application of radiation or radioactive substances to the human body; the import and export of radioactive waste from nuclear power plants.

The OFSP is the competent licensing authority in all other cases.

A licence is required for the handling of radioactive substances or of equipment or objects containing such substances, for the manufacture, marketing, construction, or use of installations or equipment capable of emitting ionising radiation and for the application of radiation or radioactive substances to the human body [Radiation Protection Act, Section 28].

A licence must also be obtained by anyone who, in an enterprise subject to licensing, employs persons who are exposed to radiation in the course of their duties in accordance with the Radiation Protection Act or the Atomic Energy Act. Licences are not required for: work with radioactive substances the activity of which does not exceed a given threshold per day; the use of radioactive substances authorised under Section 128 of the ordinance; the sale, use, storage, transportation, disposal, import, export or transit of ready-made watches containing radioactive substances if they satisfy the requirements of ISO 3157 and 4168 and watch components containing luminescent radioactive paint. Equipment and radioactive sources may be authorised for general use by the Federal Office of Public Health if the following conditions are satisfied:

- design features ensure that persons are not exposed to radiation or contaminated in an inadmissible fashion;
- provision is made for the disposal, in the same manner as radioactive waste, of any radioactive source as necessary after use; and
- the ambient dose rate at a distance of ten centimetres from the surface does not exceed one microsievert per hour.

Licensing applications must be submitted, along with the necessary documentation, to the competent licensing authority. The authority issuing the licence (for a maximum period of ten years) communicates its decision to the canton concerned, to the supervisory authority and, in the case of enterprises subject to labour legislation, to the competent Federal Labour Inspectorate.

The Act of 21 March 2003 establishes a licensing regime for persons handling nuclear materials. The licensing authority and the licensing procedure are set out by the Federal Council. The licence is limited in time and is subject to licensing conditions [Act of 21 March 2003, Section 6 *et seq.*]. In particular, the competent authority checks whether the required financial cover for nuclear third party liability is provided.

The licence holder is subject to certain obligations. In particular, he/she shall notify the supervisory authorities of activities or special occurrences which could endanger nuclear security or safety. He/she shall also check stock and keep accounts [Act of 21 March 2003, Section 11]. The Act of 21 March 2003 on Nuclear Energy provides for penal provisions which, generally speaking, are applicable to persons who intentionally infringe provisions laid down in the field of nuclear energy [Section 88 *et seq.*]. This includes breaches of security and safety measures, offences relating to

nuclear articles or radioactive waste, breach of the obligations imposed by a nuclear installation licence, breach of confidentiality, relinquishing possession of nuclear materials or radioactive waste.

4. Nuclear Installations

a) Licensing and inspection, including nuclear safety

The regulations currently in force were adopted pursuant to the Federal Act of 1959 on Atomic Energy which provides for a system of licensing for the construction and operation of nuclear installations [Section 4]. However, the Federal Order of 6 October 1978 concerning the Act on Atom Energy had already amended the licensing procedure by requiring nuclear operators first of all to obtain a so-called “general licence” determining the site and outline of the project [Section 1]. A “need requirement” was attached to this licence which would not be granted unless it was shown that construction of the planned nuclear installation met a real need in the country, and unless plans had been made for the decommissioning of the installation and disposal of the radioactive waste arising from it [Section 3].

The Act of 21 March 2003 confirms this tendency by requiring a general authorisation (decision in principle) for new nuclear installations. This general authorisation is granted by the Federal Council and is made subject to optional referendum. The concerns of the canton in which a nuclear site is to be located, as well as the cantons and states in the immediate proximity shall be taken into account [Section 44]. However, the authorisation of the canton in which a nuclear site is to be located is not required.

It is relevant to note that, at the international level, Switzerland ratified the 1994 Convention on Nuclear Safety on 12 September 1996.

Granting of general licences

The Federal Council is the body which decides upon applications for general licences [Act of 21 March 2003, Section 12]. Applications shall be sent to the Federal Energy Office, which decides whether the disposal of expertise is necessary, relating in particular to the protection of man and the environment, and disposing radioactive waste. After having invited the canton in which the installation is to be located, as well as the cantons and states in the immediate proximity to give their opinions, an enquiry must be opened and published in respect of applications for a general licence, the opinions of the cantons and specialised services, and of the expertise. The decision of the Federal Council on applications for a general licence is then submitted to the Federal Assembly for approval [Act of 21 March 2003, Section 48(2)]. General licences are granted after an enquiry procedure organised by the Federal Council provided the following conditions are met:

- the protection of man and the environment can be ensured;
- there is no other ground for refusing it under federal legislation, in particular as regards environmental protection;
- there is a plan for decommissioning or for an observation phase and a plan for closing the installation;
- radioactive waste produced shall be disposed of;
- Switzerland’s external security is not affected;

- there is nothing in any international undertaking by Switzerland to oppose it;
- as regards deep geological repositories, geological studies confirm that the site is a suitable one.

The general licence determines the site to be selected for the installation, the licence holder, the purpose of the installation, the general outline of the project, the maximal exposure limit of persons to radiation in proximity to the installation, and, in the case of a deep waste repository, the criteria for deciding that a proposed site is unsuitable, and a provisional protection area [Act of 21 March 2003, Section 14(1)].

Granting of construction and operating licences

Under the Act of 21 March 2003, these licences are granted by Federal Department of the Environment, Transport, Energy and Communications (*Département fédérale de l'Environnement, des Transports, de l'Énergie et de la Communication* – DETEC) [Act of 21 March 2003, Sections 15 and 19].

The applications considered by the Federal Energy Office are sent to the cantons concerned and the specialised services of the Confederation for their opinion [Act of 21 March 2003, Sections 43, 47 and 53]. If the DETEC issues a licence contrary to the opinion of the canton in which the installation is to be located, the latter shall have a right of appeal against this decision, however no licence granted by the canton is required [Act of 21 March 2003, Section 49(3)]. The Act of 21 March 2003 differs therefore from the Act of 23 December 1959 on the Peaceful Uses of Atomic Energy and Protection against Radiation, which provides that canton authorities are competent for granting licences in relation to the regulations of installation construction, fire brigade (fire-fighting) and water police (use of cooling water) [Section 4(3)]. By virtue of the Federal Work Act, nuclear industrial enterprises are required over and above the specific nuclear licences, to obtain approval of plans and a special licence.

The applicant shall have a right of expropriation in order to construct, operate and decommission a nuclear installation requiring a general licence, as well as to proceed with geological studies which require a licence, construct the service facilities and prepare sites for the storage or recycling of digging, excavation or demolition materials which are in direct use to the installation [Act of 21 March 2003, Section 51].

Technical advisory and supervisory bodies

The principal Nuclear Safety Division (*Division principale de la sécurité des installations nucléaires* – DSN) of the Federal Energy Office (which is part of the Federal Department of the Environment, Transport, Energy and Communications – DETEC) gives an expert opinion on safety reports relating to the various nuclear installations. The Federal Commission for the Safety of Nuclear Installations (*Commission fédérale de la sécurité des installations nucléaires* – CSN) draws up an opinion at the same time on certain particular aspects of the project. This CSN report completes the opinion of the DSN [Ordinance of 14 March 1983]. On the basis of these documents, the Federal Council takes a decision as to the licences. The Federal Energy Office is responsible for implementing licensing procedures for nuclear installations.

Nuclear installations are supervised by the Confederation [Act of 21 March 2003, Section 70]. To this end, the Federal Council and the bodies designated by it may establish measures, and monitor the implementation of such measures, in order to protect persons, property and important rights, to

insure Switzerland's external security and to guarantee that its international commitments will be fulfilled. In practice, it is the principal Nuclear Safety Division (DSN) which carries out most technical inspections of installations although the DSN may call on experts from outside the federal administration.

The Federal Commission for the Safety of Nuclear Installations and the DSN advise the authorities competent to decide on measures that are necessary for the technical safety of installations [Ordinance of 14 March 1983].

Collection of fees

Under Chapter 8 of the Act of 21 March 2003, the Federal Council decides on the fees payable for the granting, transfer, modification or withdrawal of licences, as well as for the establishment of an expertise, surveillance activities and controls.

Since 1971, the operators of nuclear power plants reimburse every year the federal supervisory authorities for the expenses they incur as a result of the construction and operation of such installations. An Ordinance on Fees in the Nuclear Field, adopted by the Council on 30 September 1985, now defines in detail the activities subject to fees and fixes the criteria for calculating the scale. This ordinance will not be repealed with the entry into force of the future Ordinance on Nuclear Energy.

Decommissioning of nuclear installations

To meet the expenses of the decommissioning and dismantling of nuclear installations which are no longer in operation and of the disposal of the resulting waste, a Fund for the decommissioning of nuclear installations was set up on 5 December 1983 under the responsibility of the Federal Council [Ordinance of 5 December 1983, Section 1, supplemented by the Regulations of the Federal Department of the Environment, Transport, Energy and Communications of 21 February 1985], to collect the necessary payments from the operators of nuclear installations. Chapter 7 of the Act of 21 March 2003 contains more detailed provisions on the topic: the Decommissioning Fund shall ensure the financing of the decommissioning and dismantling of nuclear installations withdrawn from service, and that of the disposal of the waste produced thereby (decommissioning costs), whereas the Waste Disposal Fund shall ensure the financing of the disposal of radioactive operating waste and spent fuel assemblies, after withdrawal from service of nuclear installations (disposal costs). Each fund has legal personality and is managed by an administrative board acting as the directing body [Act of 21 March 2003, Section 81]. A board shall establish the amount of the contributions paid by each contributor to the fund it manages, and the amount of the payments made by the latter. Operators pay annual contributions, the amount of which is fixed in accordance with the anticipated cost of decommissioning and dismantling the installation.

b) *Protection of the environment against radiation effects*

The Federal Office of Public Health (*Office fédéral de la santé publique* – OFSP) is responsible for the constant monitoring of radioactivity in the air, in precipitation, water and the soil. The Federal Commission for the Monitoring of Radioactivity is the competent technical advisory body. In the event of an increase in radioactivity, it proposes measures to be taken to ensure the protection of the population. The Federal Council is regularly informed of the monitoring results.

c) Emergency response

On 15 April 1987, the Federal Council adopted the Ordinance relating to the Federal Emergency Organisation on Radioactivity (*Organisation d'intervention en cas d'augmentation de la radioactivité* – OIR), which replaced the previous Ordinance of 9 September 1966 on alert in the event of increased radioactivity.* The 1987 Ordinance establishes the organisation responsible for such emergency response and describes the tasks to be performed in the event of a hazard being caused by a nuclear installation [Section 1]. The situation in Europe resulting from the Chernobyl accident highlighted the need to set up an organisation in Switzerland to co-ordinate the measures to be taken by the different public services concerned, so as to achieve optimum results. Accordingly, the ordinance lists a number of bodies in which these services are represented, lays down the conditions for their involvement, and provides for a coordinated network to enable an appropriate response to be made to an increase in radioactivity [Sections 5 to 16].

The Ordinance of 28 November 1983 on emergency measures for protection of the population in the neighbourhood of nuclear installations is also applicable [Ordinance of 15 April 1987, Section 1.3]. It lays down the measures to be taken, the tasks of nuclear operators [Ordinance of 28 November 1983, Section 4], of the federal services [Section 5] and of the cantons and communes [Section 6]. It also establishes the apportionment of the costs incurred from the organisation of emergency measures and the alarm system [Section 9].

In the event of an alarming increase in radioactivity, the emergency organisation monitors developments and proposes or recommends the measures required. At the head of this organisation is the Radioactivity Steering Committee, which is answerable to the Federal Department of the Interior. Among other resources at the disposal of the organisation is the National Alarm Centre which is responsible for alerting the authorities and the population [Ordinance of 3 December 1990].

For this purpose, the Federal Department of the Environment, Transport, Energy and Communications must, in consultation with the Federal Department of the Interior and the cantons concerned, define two zones around each installation. Zone I covers the area in which a serious incident occurring in the installation could give rise to a hazard for the population requiring rapid protection measures. Zone II, immediately beyond Zone I, covers an area with a 20 kilometre radius (with the nuclear installation at its centre) divided into sectors [Ordinance of 28 November 1983, Section 2]. Depending on the circumstances, a simple warning, a general alarm or a radioactivity alarm may be triggered [Sections 3 to 7]. The nuclear operator is responsible for providing for the appropriate emergency measures for his installation, for installing the necessary equipment and co-operating with the emergency organisation.

The distribution of iodine tablets to the population is provided for in an Ordinance of 1 July 1992. These tablets are to be used in the event of an accident leading to the emission of radioactive particles representing a potential danger to the public [Section 1]. The Federal Office of Public Health is responsible for organising the supply so as to enable the appropriate bodies to distribute the tablets according to defined geographical criteria within three areas, and to build up sufficient reserves [Section 2]. In Area 1, tablets are given as a preventive measure and in sufficient quantities to all persons regularly in the Area [Section 3]. Moreover, the Ordinance imposes on cantons and communes an obligation to build up sufficient stocks, and prescribes storage conditions which are identical to those for medicines [Sections 6 and 7]. Operators of nuclear installations

* The Ordinance of 15 April 1987 will not be repealed with the entry into force of the future Ordinance on Nuclear Energy.

participate with the Swiss Confederation in financing the costs generated by these operations [Section 13].

At the international level, Switzerland ratified both the 1986 Convention on Early Notification of a Nuclear Accident and the 1986 Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency on 31 May 1988.

5. Trade in Nuclear Materials and Equipment

The Swiss Confederation has committed itself internationally to co-operate in the campaign against the proliferation of nuclear weapons. It ratified the 1968 Treaty on the Non-Proliferation of Nuclear Weapons (NPT) on 9 March 1977, and in the same year became a member of the London Club, a group of the main states involved in the export of nuclear items. Since the adoption of an Ordinance in 1978 on definitions and licences in the atomic energy field, replaced in 1984 by a new Ordinance, nuclear items have been subject to an export licence in accordance with the London Club Guidelines [IAEA Document INFCIRC/254]. There was, however, no legal basis upon which control could be exercised, as provided for in the Guidelines, over exports of “technology” (unpublished technical information on installations for enriching and reprocessing nuclear fuels and for producing heavy water). With the amendments of 2 March 1987 and 15 November 1995 to the 1984 Ordinance, the Swiss government has been able to make exports of technology subject to the granting of a licence [Section 11].

The granting of licences for the export of sensitive nuclear equipment and materials is assessed by the competent federal authorities in the light of the London Club Guidelines and of internal legislation. The “non-proliferation of nuclear weapons” is one of the licensing criteria laid down by the act [partial revision of 9 October 1986 of the Act of 23 December 1959, Section 5.1].

The Act of 21 March 2003 provides that, notwithstanding the licensing regime, the Federal Council or the authority designated by it may prohibit or impose conditions on the import, export, transit or brokerage of nuclear articles to ensure non-proliferation of nuclear weapons. Likewise, the Federal Council may provide that no licence shall be granted in relation to certain states or groups of states [Section 8].

The Act of 23 December 1959 prohibits the export of nuclear energy when it is contrary to the public interest [Act of 23 December 1959, Section 4.5]. The Act of 21 March 2003 does not contain such an express prohibition.

Following the Ordinance of 28 October 1987, amending the Ordinance of 18 January 1984, the export of fissile materials and nuclear equipment were to be authorised twice over: first by the import and export branch of the Trade Division of the Federal Department of Economy (DFE), and secondly, a joint authorisation from the Federal Energy Office, the Federal Foreign Affairs Department (DFAE) and the Secretariat of State for Economy [Sections 11 and 15]. The Ordinance of 18 January 1984 will be repealed with the entry into force of the future Ordinance on Nuclear Energy.

Swiss nuclear legislation does not include any regulation dealing specifically with nuclear industrial property. Accordingly, the ordinary law on patents applies in the nuclear field.

6. Radiation Protection

In general, radiation protection measures taken by the Confederation are based on the recommendations of the International Commission on Radiological Protection (ICRP), and on the joint standards of international bodies (IAEA, NEA, ILO, WHO).

Aware for many years of the need to carry out a total revision of the Federal Act of 23 December 1959 on the Peaceful Uses of Atomic Energy and Protection against Radiation, the Federal Council decided in August 1982 to separate the field of radiation protection from that of the use of nuclear energy and asked the Department of the Interior to prepare a draft Bill on Radiation Protection [Message relating to a Bill on Radiation Protection of 17 February 1988]. The proposed Bill was based on Section 24 quinquies, sub-section 2 of the Constitution and covers the whole field of radiation protection (the objective being to protect man and his environment against the hazards caused by ionising radiation), but the Chapter on "Licences and Supervision" does not cover activities (nuclear installations) subject to licensing under the Atomic Energy Act.

The Radiation Protection Act of 22 March 1991 is a framework act designed to protect man and the environment against the dangers arising from ionising radiation. It applies to all activities, installations, events and situations which could present a radiation hazard, and in particular to the use of radioactive substances and equipment, installations and objects containing such substances or capable of emitting ionising radiation. The act lays down the broad principles of protection against radiation and gives the Federal Council power to promulgate detailed implementing regulations which can thus be adapted rapidly to keep pace with scientific and technological progress. The comprehensive revision of the Radiation Protection Ordinance is an example of such adaptation.

The new Radiation Protection Ordinance of 22 June 1994 is based largely on the most recent recommendations of the International Commission on Radiological Protection (ICRP). Increased protection is afforded to persons exposed to radiation in the course of their work and to the public, especially to unborn children. Dose limits and derived guideline levels have been reduced and brought into line with the new ICRP recommendations.

The ordinance introduces new rules concerning the upkeep, modernisation and control of medical X-ray equipment. Routine controls are now to be carried out by private firms, which means that controls will be more frequent than before.

Limits and guideline levels have been introduced for concentrations of radon in housing, temporary accommodation and the workplace. The cantons are the competent executive authorities in this connection. Measures to decrease levels will be imposed having regard to the seriousness of each case and the financial implications involved.

Another new provision is that limits and tolerance levels for radioactive substances in foodstuffs are established in accordance with the Radiation Protection Act. These levels will be adopted also in the Ordinance on foreign bodies in, and the contents of, foodstuffs.

Lastly, the transport of radioactive substances has for the first time been made subject to licensing. In order to obtain a licence, firms transporting radioactive substances, whether on their own account or on behalf of others, must now prove that they have the technical know-how required and a suitable quality assurance programme.

Both the Act and the Ordinance on Radiation Protection entered into force on 1 October 1994.

Nuclear Legislation in OECD Countries
Regulatory and Institutional Framework for Nuclear Activities

The Federal Department of the Interior (*Département fédéral de l'Intérieur* – DFI) and the Federal Department of the Environment, Transport, Energy and Communications (DETEC) are responsible for implementing regulations in the field of radiation protection. They concentrate particularly on the protection of persons, and thus are concerned with health risks which may affect certain groups of people – workers or patients – or the population as a whole, when exposed to ionising radiation. Those who, in their work, handle radioactive substances or use radiation-producing equipment are required to have received adequate radiation protection training.

The Federal Commission for Protection against Radiation (*Commission fédérale de la protection contre les radiations* – CPR) gives advice on matters concerning radiation protection to the Federal Council, the Federal Department of the Interior (DFI) the Federal Department of the Environment, Transport, Energy and Communications (DETEC), interested services and the Swiss National Accident Insurance Office (*Caisse nationale suisse d'assurance en cas d'accidents* – CNA).

It gives its opinion, *inter alia*, on:

- the interpretation and evaluation of international recommendations concerning radiation protection with a view to their application in Switzerland;
- the preparation and development of standard principles for applying radiation protection requirements.

The competent authorities for granting licences to use ionising radiation are the Federal Office of Public Health (OFSP) and, for activities carried on in nuclear installations and tests involving radioactive substances in the framework of preparatory measures within the meaning of Section 10.2 of the Federal Order of 6 October 1978 concerning the Atomic Energy Act, the Federal Energy Office.

The OFSP, the CNA and the principal Nuclear Safety Division (*Division principale de la sécurité des installations nucléaires* – DSN) are responsible for supervising the protection of persons and the neighbourhood.

The OFSP exercises control over firms in which the primary concern is to protect the public, in particular, medical companies and research and training institutes in higher education establishments.

The CNA exercises control over firms in which the primary concern is protection of workers, in particular, industrial firms and small businesses.

The DSN supervises:

- nuclear installations;
- preparatory measures within the meaning of Section 10.2 of the Federal Order of 6 October 1978 concerning the Atomic Energy Act;
- the Paul-Scherrer Institute (IPS), except for applications of ionising radiation or radioactive substances to the human body;
- the radioactive waste collection centre. The collection is carried out by the IPS.

The Act of 21 March 2003 partially amends the 1991 Act on Radiological Protection, but maintains its main principles. In particular, it amends the sections designating the authorities granting licences for activities in nuclear installations and trials involving radioactive substances in the context of preparatory measures. The Federal Council shall designate the licensing authorities. It may also delegate to DETEC or to subordinate services the power to lay down radiological protection

requirements for the activities for which a licence is required by the Act of 21 March 2003 [Act of 22 March 1991 as amended by Act of 21 March 2003, new Sections 30 and 47].

7. Radioactive Waste Management

It should be pointed out in this context that in the current Swiss regulations, and until the entry into force of the Act of 21 March 2003 and of the future Ordinance on Nuclear Energy, the term “residues” (*résidus*) is used for a particular category of materials. The 1984 Ordinance on definitions and licences in the atomic energy field stipulates that residues are the radioactive materials (including activation products) whose activity does not exceed 100 gigabecquerels and which are formed from nuclear fuels after the nuclear transmutation process [Ordinance of 18 January 1984, Section 2, as amended on 18 October 1987]. The Federal Council may also include in this category, by assimilation, integral parts of nuclear installations which have become radioactive during atomic energy production [Act of 23 December 1959, Section 1]. The term “radioactive waste” applies to nuclear materials and articles contaminated by such materials which are not to be used again [Ordinance of 18 January 1984, Section 3]. In practice, radioactive waste (*déchets*) is mainly material resulting from the use of radioisotopes. Such radioactive waste results from the handling of radioactive sources of all kinds; it broadly includes waste produced as a result of industrial, medical, research and educational uses.

In fact, Swiss regulations do not always make this distinction and, for convenience, the term waste has been used in this section. When residues are concerned, this is indicated in brackets.

The Ordinance of 18 January 1984 will be repealed and replaced by the future Ordinance on Nuclear Energy. Following the Act of 21 March 2003, “radioactive waste” shall mean radioactive substances or materials contaminated by radioactivity which are not re-used [Section 3].

Pursuant to the Act of 21 March 2003, the disposal of radioactive waste is based on a new concept defined by an expert group. Following a long observation phase, the underground repository of radioactive waste is sealed and placed under the authority of the state. Until the repository is sealed, costs are covered by nuclear operators, who shall therefore submit to the government a waste disposal plan including a schedule, as well as technical aspects of the different disposal stages and a financial plan.

The act provides in Section 30 that radioactive waste produced in Switzerland shall, in principle, be disposed of in Switzerland, in such a way that the lasting safety of man and the environment is ensured. A licence to export radioactive waste for conditioning must be issued, provided that a number of conditions are met: in particular, the destination state shall have a suitable disposal facility. It shall also have approved, in an international convention, the import of radioactive waste for the purpose of conditioning. In addition, transit states must have approved the transit and there must be an agreement with the receiver on the return of waste [Section 34].

It is relevant to note that, at the international level, Switzerland has ratified the 1997 Joint Convention on the Safety of Spent Fuel management and on the Safety of Radioactive Waste Management.

a) Waste from nuclear installations

Licensing system

The Federal Atomic Energy Act of 1959 dealt with the question of radioactive waste (residues) only from the viewpoint of a licence, or the revocation of a licence, for its possession and transport [Act of 23 December 1959, Sections 4 and 9].

Provisions dealing with the question of waste are now included in the Federal Order of 6 October 1978, supplementing the Atomic Energy Act [Sections 1 and 10]. A Federal Council Ordinance of 27 November 1989 contains details as to the implementation of the licensing procedure, and lays down the preparatory steps to be taken in constructing a repository for radioactive waste provided for in Section 10 of the Federal Order of 1978.

The Federal Council lays down implementing provisions and designates the relevant administrative bodies and the Commissions responsible for studying nuclear energy questions. The possession, transport, import and export of radioactive waste (residues) require a licence from the Confederation [Act of 23 December 1959, Section 4].

The licensing regime applicable to radioactive waste repositories follows the same procedure and involves the same authorities as those involved in the licensing of nuclear installations (general licences) [Ordinance of 18 January 1984, Section 6 and amendment of 2 March 1987]. The general licence, which fixes the site and the general outline of the project, also determines the storage capacity and the categories of waste as well as the structure of the underground or surface installations. Before granting a licence, the Federal Council consults the local communities concerned and the services of the Confederation specialised in the field.

The Federal Energy Office is responsible for implementing the procedure for licences for installations for the disposal of nuclear waste after consultation with the Federal Commission for the Safety of Nuclear Installations. The latter gives its opinion after having seen the first safety assessment reports by the principal Nuclear Safety Division of the Federal Energy Office [Ordinance of 14 March 1983, Section 2].

Should a licence to possess radioactive waste (residues) be revoked, the waste is transferred either to another licence-holder or to the Confederation [Act of 23 December 1959, Section 9.4].

The Confederation is responsible, as it is for nuclear installations, for supervising the possession of radioactive waste (residues) [Section 8], and this task is carried out by the principal Nuclear Safety Division of the Federal Energy Office. The supervisory bodies are empowered to have any radioactive waste which constitutes a radiation protection hazard seized or disposed of, at the producer's expense [Act of 23 December 1959, Sections 9 and 39; Federal Order of 6 October 1978, Section 10].

A licence is also required for the transport or possession of wastes (residues) [Section 4.1]. The granting of such licences is the responsibility of the Federal Energy Office [Ordinance of 18 January 1984, Section 9]. The task of supervising these activities is carried out by the principal Nuclear Safety Division.

Storage and disposal of waste

As provided for by the Federal Order of 6 October 1978 supplementing the Atomic Energy Act, different principles apply to the management and disposal of radioactive waste, such as the responsibility of producers of waste to organise its safe disposal [Section 10.1]; the introduction by the Federal Council of a special procedure authorising preparatory measures for the construction of a radioactive waste repository [Section 10.2]; the obligation for waste producers to become members of a public body and to pay equitable contributions to cover the costs of waste disposal [Section 10.3]; the guarantee of the safe disposal of radioactive waste (transitional provisions having been made for installations in operation or being built] being made a condition for the granting of general licences for nuclear power plants [Section 3.2].

Repositories must conform to the safety conditions and technical criteria laid down by the Federal Commission for the Safety of Nuclear Installations and the Federal Energy Office in Directives R-21 of October 1980.

A Confederation working group on radioactive waste management (*Groupe de travail de la Confédération pour la gestion des déchets nucléaires – AGNEB*) was set up by the Federal Council on 15 February 1978. This Group is responsible for following the work carried out in this sector by other bodies, and for preparing the technical elements necessary for making an evaluation and which will serve as an aid to the Federal Council and the Federal Department of the Environment, Transport, Energy and Communications when taking decisions in this field. It ensures that the Confederation respects the time limits prescribed for licensing procedures and reports once a year to the Department.

In 1972, the producers of radioactive waste, including the Confederation, formed a private company – the National Corporation for the Disposal of Radioactive Waste (*Société coopérative nationale pour l'entreposage des déchets radioactifs – NAGRA*) – which has the task of managing the radioactive waste for which waste producers are responsible.

With respect to operating licences for nuclear power plants not covered by the provisions of the Federal Order of 6 October 1978 as they were already in operation or under construction, the Federal Department of the Environment, Transport, Energy and Communications made prolongation of their validity beyond 1985 subject to the guarantee of a satisfactory method of disposing of the waste from the installation. The electricity companies concerned were thus obliged to submit proposals offering such a guarantee to the Federal Council before 31 December 1985.

Since then, the National Corporation for the Disposal of Radioactive Waste (NAGRA), commissioned by the Swiss nuclear power plants, has been at work to demonstrate the feasibility of waste disposal. In January 1985, NAGRA submitted a “1985 Guarantee Project” (“*projet garantie 1985*”) to the Swiss safety authorities (namely the principal Nuclear Safety Division and the Federal Commission for the Safety of Nuclear Installations, both answerable to the Federal Energy Office). The Confederation Inter-Agency Working Group entrusted with supervising work on nuclear waste management (AGNEB) was made responsible for submitting a prior opinion on the NAGRA project to the Federal Council. Swiss and foreign experts were called upon to assist in preparing this opinion.

Since the assessment of such a project is time-consuming, the Federal Council, so as not to compromise its exhaustive and scientific nature, decided to extend the time limit for establishing the “Guarantee” until such time as it was able to judge the contents of the said report. Until then, operating licences for nuclear power plants were to remain valid.

In June 1988, following a detailed examination by the safety authorities, the federal government decided that a sufficient guarantee of safety had been established for all categories of waste, although a site still had to be found for high and medium-level waste.

On 27 November 1989, the Federal Council adopted an Ordinance on preparatory measures for the construction of radioactive waste repositories, thus repealing the Ordinance of the same name of 24 October 1974. The Federal Order of 6 October 1978 concerning the Atomic Energy Act provides that the Federal Council must grant a licence before preparatory measures can be undertaken for constructing a radioactive waste repository (in practice, the research carried out by the National Corporation for the Disposal of Radioactive Waste – NAGRA), the licensing procedure being determined by ordinance [Section 1]. Under the 1989 Ordinance, the federal licensing procedure, which has been simplified, is restricted mainly to nuclear safety. Some work, such as seismic research and surface drilling, must be notified to the supervisory authorities, but they no longer require a licence from the Federal Council [Ordinance of 27 November 1989, Section 2.2]. This new ordinance should enable NAGRA to accelerate its work.

Over and above the licences required for nuclear installations, a special licence is necessary in the case of waste repositories in order to proceed with preparatory steps to set up such a repository [Ordinance of 27 November 1989, Section 2]. The Federal Council is the competent authority to grant such licences [Section 14] by virtue of an instruction issued to the Federal Department of the Environment, Transport, Energy and Communications; the cantons concerned and the specialised services of the Confederation are invited to make observations [Sections 10 to 12]. Supervision of the preparatory and follow-up measures and work is carried out jointly by the specialised services of the Confederation designated by the Federal Council, and by the cantons concerned [Section 15]. The Federal Order of 6 October 1978 gave the Federal Council the power of compulsory purchase in order to establish repositories, and this power may be transferred to the beneficiary of the compulsory purchase [Section 16].

b) *Waste from industrial, research, medical and educational uses*

These types of waste are governed by the Radiation Protection Ordinance of 22 June 1994 [Sections 79 to 93] as amended on 3 June 1996 by the Federal Council. The Ordinance of 8 July 1996 on the transport of radioactive waste [RS 814.557] regulates the method of treating radioactive waste both before and during its transport and for the purposes of its declaration to the Paul-Scherrer Institute (IPS). It co-ordinates the collection activity organised by the Federal Office of Public Health together with the IPS. The ordinance entered into force on 1 August 1996 and repeals the Ordinance of the Federal Department of the Interior of 18 March 1977. Annexes 1 to 4 specify the types and classes of radioactive waste, the type of packaging required (including technical details) and the proper accompanying documentation for each delivery.

In accordance with the Radiation Protection Ordinance, all radioactive waste producers must make provision for the temporary storage of waste at the site of production, and submit details of their proposal for approval either to the Swiss National Accident Insurance Office in the case of enterprises subject to the Federal Accident Insurance Act, or to the Federal Office of Public Health in all other cases. This procedure is necessary before the Insurance Office or the Office of Public Health can take a decision as to the licences for the possession and use of radioactive substances, and equipment containing such substances [Ordinance of 22 June 1994, Sections 84 to 86; Act of 22 March 1991].

It is the Confederation's responsibility to collect all the radioactive waste produced by the institutes and enterprises within its territory. The collection of this waste is organised jointly by the

Federal Office of Public Health and the Paul-Scherrer Institute (IPS). The waste is sent to collection centres designated by the public authority, either to be stored in a repository set up under the responsibility of the Federal Department of the Interior, or to be disposed of [Ordinance of 22 June 1994, Sections 82 to 86]. The modification of the Ordinance of 8 July 1996 now requires that radioactive waste not derived from the use of nuclear energy must be delivered to the IPS at Villigen (Canton of Argovie) after having been properly treated.

The Federal Department of the Interior is the regulatory authority responsible for making any implementing provisions required for radioactive waste management [Ordinance of 22 June 1994, Section 87.3].

8. Non-Proliferation and Physical Protection

There is no legislation dealing specifically with nuclear security in Switzerland. However, special provisions have been included in nuclear instruments adopted by the Confederation.

The general licence required for the operation of a nuclear power plant is granted only to Swiss citizens resident in Switzerland. Section 5(3) of the Federal Act of 23 December 1959 on Atomic Energy provides that “the Federal Council may make licences to construct or operate nuclear installations subject to the condition that the applicant be a Swiss citizen residing in Switzerland. For licences requested by corporations, the Federal Council may require that at least two-thirds of the Board of Management be Swiss citizens residing in Switzerland and that the registered office be located in Switzerland”. Similarly, Section 3(3) of the Federal Order of 6 October 1978 amending the said federal act provides that “general licences are granted only to Swiss citizens resident in Switzerland and to corporations regulated by Swiss law which have their registered office in Switzerland and are under Swiss control”. In this regard, the Act of 21 March 2003 provides for less restrictive conditions to be fulfilled by applicants for a general licence. The latter may be granted to limited liability companies, cooperative societies or corporate bodies governed by public law. A foreign company shall have a Swiss subsidiary company listed on the commercial register. However, if not in breach of any international undertaking, the Federal Council may refuse a general licence to a company governed by foreign law when the state in which it has its headquarters does not grant reciprocity [Act of 21 March 2003, Section 13.2].

General licences for nuclear installations and licences to handle nuclear articles shall be granted provided that this would not be in breach of any international commitment and that Switzerland’s external security is not affected [Act of 21 March 2003, Sections 7(e) and 13.1(e), (f)].

Pursuant to Section 8 of the Act of 23 December 1959, in supervising nuclear installations and the possession of nuclear fuels, the Federal Council, or the body appointed by it, takes all steps which may be necessary for the external security of the country and for the fulfilment of its international commitments. The Act of 21 March 2003 does not contain a similar express provision, however, it grants wide powers of investigation to the nuclear supervisory authorities. The latter shall inform the public of the state of nuclear installations and of the situation relating to nuclear articles and radioactive waste; in addition they may not process personal sensitive data [Act of 21 March 2003, Sections 72 *et seq.*]. When national defence is at stake, the supervisory authorities in the radiation protection field have the power to waive health requirements.

Generally speaking, all licences required by the Act of 21 March 2003 are granted provided the protection of man and the environment is ensured [Sections 7, 13, 16, 20]. Moreover, a licence to handle nuclear articles shall be granted provided that there are no grounds for refusal it relating to the

non-proliferation of nuclear weapons, in particular international control measures supported by Switzerland, even if not formally binding in international law.

It should be noted that, at the international level, Switzerland ratified the 1968 Treaty on the Non-Proliferation of Nuclear Weapons, on 9 March 1977, and the 1996 Comprehensive Test Ban Treaty, on 1 October 1999. It also ratified the 1980 Convention on the Physical Protection of Nuclear Materials.

9. Transport

The transport of radioactive or fissile materials in Switzerland is governed by a number of different regulations, each dealing with a particular form of transport. In general, these instruments implement in Switzerland the international regulations in this field.

Thus, for road transport, the basic text is the Federal Council Ordinance of 24 May 1972 (as amended on 1 January 1979), relating to the transport of dangerous goods by road (SDR). The ordinance provides that foreign vehicles which do not fully satisfy the technical norms which it prescribes shall nevertheless be allowed into Switzerland provided that the transport operation meets the standards laid down in the European Agreement of 30 September 1957 (as revised on 1 October 1978), concerning the International Carriage of Dangerous Goods by Road (ADR) [Ordinance of 24 May 1972, Section 1.4].

For transport by rail, the legislation in force is contained in the Regulations concerning transport by rail and by water, known as the Transport Regulations, of 2 October 1967 (updated on 1 January 1990) whose Annex I incorporates the International Regulations concerning the Carriage of Dangerous Goods by Rail (RID). This Annex is itself entitled the Swiss International Regulations concerning the Carriage of Dangerous Goods by Rail (RID/RSD).

The transport of radioactive or fissile materials by inland waterway is governed by the above-mentioned Transport Regulations (RID/RSD), and if on the Rhine, is subject to the Regulations for the Transport of Dangerous Goods on the River Rhine (ADNR) of 29 April 1970.

The Air Transport Regulations of 3 October 1952 apply to the transport by air of radioactive or fissile materials authorised by the Federal Civil Aviation Office, on condition that the transport is carried out in accordance with the regulations laid down by the International Air Transport Association (IATA) concerning the transport of restricted articles by air [Regulations of 3 October 1952, Sections 13 and 14, approved by the Federal Order of 16 December 1952. Decision of 1 July 1963]. The Act of 21 March 2003 on Nuclear Energy prohibits the transport of nuclear materials containing plutonium in Swiss air space [Section 10].

The sending by post of radioactive or fissile materials whose specific activity does not exceed 0.002 microcurie per gramme is governed by the Federal Council Ordinance of 1 September 1967 as amended on 21 November 1979, which amends the implementing Ordinance of the Post Office Act. In cases where the specific activity of the materials exceeds this figure, the Transport Regulations (RID/RSD) applies.

The Federal Department of the Environment, Transport, Energy and Communications is responsible for transport operations by road, rail and inland waterway. This Department has the task, along with the other bodies concerned, of drawing up regulations in the field of the transport of radioactive or fissile materials. In the case of air transport, the Federal Civil Aviation Office may

impose additional requirements to be observed during transport operations, as long as these do not contradict the regulations laid down in this field by IATA [Air Transport Regulations of 3 October 1952, Section 14]. As for sea transport, the relevant international regulations are applied directly [Decision of 1 July 1963, Section 1].

10. Nuclear Third Party Liability

Switzerland has signed the 1960 Paris Convention on Third Party Liability in the Field of Nuclear Energy, and the 1963 Brussels Supplementary Convention, but has not ratified them. On 14 December 1992, the Federal Council decided not to ratify the Paris Convention and the Brussels Supplementary Convention in the near future, on the grounds that Switzerland had adopted relatively recently an Act on Nuclear Third Party Liability dated 18 March 1983, and that certain provisions adopted differed from those of the Paris Convention. Moreover, a comprehensive review of Swiss nuclear energy legislation is being undertaken. Ratification of the two Conventions has thus been postponed until a later date. Switzerland, however, continues to follow with great interest international developments in the law of nuclear third party liability, and participates in the discussions carried out in this field. In addition, it signed the Protocols to amend the Paris Convention and the Brussels Convention on 12 February 2004.

Provisions relating to nuclear third party liability were originally contained in the Federal Act of 23 December 1959. These provisions were completed on 13 June and 19 December 1960 respectively by a Federal Council Ordinance and Order. This legislation, whose purpose was to regulate the operation of the Fund for Delayed Atomic Damage provided for under Section 19 of the 1959 Federal Act, has since been repealed.

The Federal Council decided to exempt operators of nuclear installations, whose nuclear fuel and waste has an activity of less than 1 curie, from the legal provisions on third party liability and mandatory insurance.

Meanwhile, questions of third party liability were regulated in a general fashion by the Act of 18 March 1983 on Nuclear Third Party Liability (*Loi sur la responsabilité civile en matière nucléaire* – LRCN), which was followed by an implementing Ordinance of 5 December 1983. This Act abides by two basic principles, namely that of strict liability and that of the channelling of liability to the operator of a nuclear installation. On the other hand, the LRCN rejects the principle of the limitation of third party liability in amount and provides that the person liable must commit himself for an unlimited amount. The Federal Council is obliged under this Act to increase the minimum amount covered by private insurance once the insurance market offers higher cover on acceptable terms. Accordingly, on 19 November 1997, the government further amended the Ordinance of 5 December 1983 on Nuclear Third Party Liability (ORCN), which had already been amended in December 1985, in October 1990 and in December 1996. The general situation on the insurance market changed dramatically after the events of 11 September 2001. The Swiss National Insurance Pool decided to modify private policies covering nuclear installations on Swiss territory and to limit the cover for damage due to terrorist acts. This modification to private policies led to an amendment of the ORCN.

Liability is covered as follows:

- by private insurance up to Swiss francs (CHF) 1 billion for each nuclear installation (CHF 50 million for each operation involving the transport of nuclear goods across Switzerland) [LRCN of 18 March 1983, Section 11; ORCN of 5 December 1983,

Section 3, as amended on 4 December 2000]; this amount may be limited to CHF 500 million for damage caused by a terrorist act [ORCN of 5 December 1983, as amended by the Ordinance of 29 November 2002, Section 4(1)(a^{bis})];

- by the Confederation up to CHF 1 billion when the damage exceeds the amount covered by private insurance, or is excluded therefrom [LRCN of 18 March 1983, Section 12];
- by all the assets of the person liable;
- according to a special procedure with regard to “catastrophes”.

The adoption of an Ordinance of 19 November 1997, which entered into force on 1 January 1998, modified the method of calculating federal nuclear third party liability insurance premiums to be paid by potentially liable persons. As of 1 January 1998, these amounts are fixed in Swiss francs rather than as a percentage of the premiums collected by private insurers for third party liability coverage.

The Fund for Delayed Atomic Damage has been transformed into a Fund for Nuclear Damage. Fees are levied from nuclear operators and holders of transport licences so as to cover the contributions made by the Confederation [Sections 14 and 15].

The Federal Council Ordinance of 5 December 1983 (ORCN) specifies the scope, insurance conditions, coverage of costs by the Confederation and the management of the Fund for Nuclear Damage set up by the LRCN. The Fund is not a separate legal entity but is financially independent. The ORCN also provides for the assignment of the costs of preventive measures taken by the appropriate authorities.

The Act of 21 March 2003 has amended the provisions of LRCN relate to deep repositories: it provides that, where damage is caused by a deep geological repository which is no longer governed by nuclear energy legislation, the Confederation shall cover nuclear damage out of general funds and up to CHF 1 billion.

II. INSTITUTIONAL FRAMEWORK

The Act of 21 March 2003 contains few provisions related to the institutional framework to be introduced by the new nuclear legislation. These provisions will be further developed in the ordinances implementing the act and in particular in the future Ordinance on Nuclear Energy. The following chapter describes the new elements contained in the Act of 21 March 2003, however, it mainly describes the current institutional framework which will remain until the entry into force of the Act of 21 March 2003 and its implementing ordinances.

Since 24 November 1957, when Article 24 quinquies (now Article 90 of the amended Swiss Constitution which entered into force on 18 April 1999) was inserted into the Swiss Constitution, nuclear energy has been declared to be the responsibility of the federal legislature. Thus the Confederation supervises all nuclear activities and is very active in their organisation and development. The Confederation also plays an important role in the field of research and the training of nuclear specialists [Act of 23 December 1959, Section 2]. Lastly, it may acquire the nuclear

materials necessary or forbid the export of such materials (although it is normally the operators of nuclear power plants who acquire and possess nuclear fuels, with the authorisation of the Confederation) [Sections 3 and 5].

The Federal Council has the necessary regulatory and administrative powers to adopt the regulations required for the development of the use of nuclear energy and for radiation protection. The Federal Department of the Environment, Transport, Energy and Communications, and the Federal Department of the Interior are responsible for implementing the provisions adopted by the Federal Council in the field of the use of atomic energy and the field of protection against ionising radiation, respectively. Various commissions study questions relating to the use of atomic energy, each in its specific field of competence.

Apart from the federal departments and the specialised services of the Confederation, the public sector is also represented by a public scientific research centre, the Paul-Scherrer Institute.

1. Regulatory and Supervisory Authorities

a) Federal Council

The Federal Council, which represents the executive branch of government in Switzerland at federal level, plays an important role in the organisation and running of nuclear activities. The Act of 21 March 2003 maintains the Federal Council as a key body in the nuclear institutional framework.

In the first place, the Federal Council assists in the development of regulations in the atomic energy field, and ensures their implementation [Act of 23 December 1959, Sections 11 and 37; Act of 21 March 2003, Section 101]. More particularly, the Federal Council has the power to broaden the category of activities for which a preliminary licence is required [Act of 23 December 1959, Section 4.2; Act of 21 March 2003, Section 6]. On the other hand, under the Act of 23 December 1959, it may also waive the rules on licences, third party liability and insurance, in the case of activities which give rise to only a very low risk of radiotoxicity [Section 1.4]. Under the Act of 21 March 2003, the Federal Council or the authority designated by it may make exceptions to the licensing regime by taking special measures against specific destination states [Section 8]. It may also exclude from the scope of this act low-level nuclear articles and radioactive waste.

On an administrative level, the Federal Council has been made responsible for examining and deciding upon applications for preliminary general licences for nuclear installations, prior to construction and operating licences [Federal Order of 6 October 1979, Sections 1 and 5 to 8; Ordinance of the Federal Council of 11 June 1979, Sections 3 and 4]. This provision is maintained in the Act of 21 March 2003 [Section 12]. The Federal Council also grants licences for taking preparatory steps for the setting up of a radioactive waste repository [Federal Order of 6 October 1978, Section 10; Ordinance of the Federal Council of 27 April 1989, Section 2]. Under the Act of 21 March 2003, the DETEC is the competent licensing authority [Section 35]. However, the act provides that the Federal Council may exclude from the licensing regime studies which involve only minor prejudice.

In general, the Federal Council licenses and supervises nuclear installations and materials. It may take measures necessary for the protection of persons, property and important rights, as well as for Switzerland's external security and fulfilment of its international commitments [Act of 23 December 1959, Section 8; Ordinance of 18 January 1984, Section 6]. The Act of 21 March 2003 does not maintain such an express provision, however, it grants wide powers of investigation to nuclear supervisory authorities.

The Federal Council may set out procedures to regulate activities relating to nuclear installations, including a licensing regime for handling nuclear articles [Act of 21 March 2003, Section 6] and the procedure organising reliability tests. It lays down the minimum requirements which specialised staff of nuclear installations and the surveillance team have to meet [Act of 21 March 2003, Sections 22 and 23]. It lays down the criteria applicable to protection zones [Section 40].

In general, the Federal Council sets up the necessary administrative bodies, and the commissions responsible for studying questions relating to the use of nuclear energy and to radiation protection [Act of 23 December 1959, Sections 37 and 38; Act of 21 March 2003, Sections 6, 24, 32, 70, 71, 81].

Within the nuclear legislative framework applicable until the entry into force of the Act of 21 March 2003, and for the purposes of promoting nuclear research, the Federal Council is authorised to give financial assistance to research agencies.

b) *Federal Assembly*

The Federal Assembly, Switzerland's parliament, is involved in the nuclear field in approving the Federal Council's decisions as to general licences for nuclear installations [Federal Order of 6 October 1978, Sections 1 and 8; Ordinance of the Federal Council of 11 July 1979, Section 4; Act of 21 March 2003, Sections 48 and 67]. The Act of 21 March 2003 provides that, if the Federal Council refuses to grant a general licence and the Federal Assembly does not approve this decision, it shall instruct the Federal Council to grant the general licence with any requirements decided by it and to submit to it a new decision for approval. The decision of the Federal Assembly regarding the approval of a general licence shall be subject to referendum.

The Assembly is also competent in respect of third party liability and insurance [Act of 18 March 1983, Section 29]. Thus, in the case of catastrophes, the Federal Assembly is empowered to draw up indemnification rules determining the general principles of compensation for victims. A special independent body may be set up by the Federal Assembly to ensure that these principles are applied.

The Act of 21 March 2003 requires that the Federal Council regularly inform the Federal Assembly of the progress of the programme prepared by the persons responsible for disposing of radioactive waste [Section 32].

c) *Federal Department of the Environment, Transport, Energy and Communications (DETEC)*

The general task of the Federal Department of the Environment, Transport, Energy and Communications (*Département fédéral de l'Environnement, des Transports, de l'Énergie et des Communications* – DETEC) is to prepare legislation on the use of nuclear energy [Ordinance of the Federal Council of 9 May 1979]. In conjunction with the Federal Department of the Interior, and after having consulted the competent supervisory bodies, it lays down guidelines on the supervisory measures which should be taken to protect the population, and on co-ordinating the work of the bodies responsible for supervision [Ordinance of the Federal Council of 30 June 1976, Section 20].

The DETEC has the task of following the licensing procedure in the case of applications for licences to take preparatory steps for studying sites with a view to setting up radioactive waste repositories [Ordinance of 27 November 1989, Sections 4, 10 *et seq.*].

Under the Act of 21 March 2003, the DETEC is the competent authority to grant construction and operating licences [Sections 15 and 19], as well as licences for geological studies carried out in a possible location in order to gather information about the feasibility of constructing a deep geological repository [Section 35].

Lastly, under the Ordinance of 9 May 1979, the Federal Commission for the Safety of Nuclear Installations reports to the DETEC. The Law of 21 March 2003 maintains this provision [Section 71].

d) *Federal Energy Office (OFEN)*

Under the Order of the Federal Council of 23 December 1968 on the reorganisation of Swiss administrative authorities, the Federal Energy Office (OFEN), which forms part of the Federal Department of the Environment, Transport, Energy and Communications, was given the powers which previously belonged to the Delegate for Atomic Energy Questions, except for those which were expressly conferred on the Science and Research Division [Order of the Federal Council of 23 December 1968, Section 5; Federal Act of 19 September 1978 on the organisation of the Administration; Ordinance of 9 May 1979].

The OFEN therefore is competent to prepare and apply legislation in the field of nuclear energy, and also to prepare, in conjunction with the Federal Department of Foreign Affairs, international nuclear treaties and to ensure that they are properly implemented. The Office also has the task of examining and co-ordinating studies carried out in the field of nuclear energy. Under the Ordinance of the Federal Council of 18 January 1984, the OFEN is responsible for examining applications for the construction, operation or modification of nuclear installations, and in the case of nuclear installations which do not produce electricity, it also grants the licences. Under the Act of 21 March 2003, applications for a general licence shall be sent to the OFEN, which checks the application file and decides whether an expertise is necessary [Sections 42 and 43].

Furthermore, the Office is the competent authority for licensing the transport, import and export of nuclear materials and equipment, and for the storage of nuclear fuels and radioactive waste [Section 9].

The Federal Energy Office includes a principal Nuclear Safety Division (*Division principale de la sécurité des installations nucléaires – DSN*). This Division is called upon to give an expert opinion on the technical safety reports relating to the various licences required under Swiss nuclear law: general licences and licences for the construction and operation of nuclear installations, licences for the transport and marketing of nuclear materials and equipment, and licences in the field of radioactive waste management. The Division also ensures that technical checks are carried out on nuclear installations and on the Paul-Scherrer Institute, and concentrates on measures to be taken to prevent nuclear catastrophes.

e) *Federal Department of the Interior*

As regards nuclear matters, the Federal Department of the Interior (*Département fédéral de l'intérieur*) has been given regulatory and administrative powers in the area of radiation protection. It is

also competent with regard to nuclear research questions and co-ordinates activities with the universities and federal *Écoles Polytechniques* [see Section 3(a) – Paul-Scherrer Institute].

With regard to its regulatory powers, the Federal Department of the Interior has a general responsibility for radiation protection questions. It has the task of laying down the necessary rules for applying measures enacted by the Federal Council for protection against ionising radiation. In particular, the Federal Department of the Interior, with the assistance of the Federal Department of the Environment, Transport, Energy and Communications, and after consulting the competent supervisory bodies, lays down guidelines for supervisory activities to be carried out in the radiation protection field.

In addition, the Federal Department of the Interior, in agreement with the Federal Commission for Protection against Radiation, lays down guidelines on measures to be adopted for the protection of persons exposed to radiation for medical purposes. With regard to foodstuffs, the Federal Department of the Interior determines the maximum concentrations of radionuclides which may be incorporated in food products.

Moreover, the Federal Department of the Interior determines the training programme, the method of examination, and rights in relation to the training and advanced courses offered by the Confederation in the field of radiation protection. Courses given by private institutions must first be approved by the Federal Department, or the competent supervisory body, if they are to benefit from subsidies which will be fixed by the Federal Department of the Interior. In any event, in order to use radioactive materials or equipment generating ionising radiation in a professional context, it is necessary to have completed training recognised by the Federal Department of the Interior or the competent supervisory body. By reason of its administrative powers, the Federal Department of the Interior, with the assistance of the Federal Department of the Environment, Transport, Energy and Communications, co-ordinates the activities of nuclear bodies involved in radiation protection.

The Federal Department of the Interior also has the power to impose any necessary measures with regard to the medical supervision of persons exposed to ionising radiation at work.

In the radioactive waste management field, the Federal Department of the Interior ensures the disposal by the Paul-Scherrer Institute (IPS) of radioactive waste other than that coming from electricity-producing nuclear installations and facilities for the reprocessing of spent fuel.

Lastly, the Federal Office of Public Health and the Federal Office of Education and Science both report to the Federal Department of the Interior [Order of the Federal Council of 23 December 1968, Section 1]. It may hear appeals from decisions made by the Federal Office of Public Health.

f) *Federal Office of Public Health (OFSP)*

Through the agency of its Radiation Protection Division, the Federal Office of Public Health (*Office fédéral de la santé publique* – OFSP) enjoys wide administrative and supervisory powers in the field of protection against radiation.

Administrative powers

The Office is the competent authority for the granting or revocation of licences for the production, use, possession, disposal, import and export of radioactive substances and for nuclear equipment, whether used for industrial, scientific, medical or agricultural purposes, with the exception of nuclear installations, nuclear fuel and radioactive waste (residues). If, however, a negative response is given by the Swiss National Accident Insurance Office (*Caisse nationale Suisse d'assurance en cas d'accidents* – CNA), which considers applications from bodies subject to the Federal Act on Accident Insurance, then the Federal Office is bound by this opinion. Persons possessing radioactive substances or equipment emitting ionising radiation for which no licence is required because the quantity or activity of the nuclear material concerned is below a given threshold, must make a declaration to the Federal Office. Persons manufacturing or trading in such substances or equipment which are not freely available or are for restricted use, must submit an annual report to the Federal Office on their activities. The Office may allow certain types of radioactive substances and equipment emitting ionising radiation or containing radioactive substances to be used generally or for specific purposes. The Federal Office of Public Health grants the necessary licence for the restricted use of substances and equipment, and receives the declarations of persons possessing substances or equipment available for general use, unless it waives such formalities.

The Federal Office of Public Health, in consultation with a panel of experts representing various interests, is also the competent authority for approving radioactive substances intended to be used for medical purposes. It must authorise any work involving unsealed radioactive sources which a company wishes to carry out outside its own premises.

Supervisory powers

An expert designated by the Federal Office of Public Health checks those parts of equipment used for radiotherapy which determine the radiation dose given, every time the equipment is modified in such a way that this dose could be affected and in any event at least once a year [Section 58]. The licence-holder keeps a record of the results of these verifications. The Federal Office may require that equipment used for diagnosis be checked annually over a period of four weeks in normal working conditions. A record is kept of the number and location of radiographic and radiosopic examinations carried out during this period, as well as of the conditions under which they took place.

In general, the Office advises the Federal Department of the Interior and that of Transport, Communications and Energy on the guidelines to be adopted with regard to the carrying out of inspections.

The Federal Office of Public Health supervises enterprises in which the primary concern is protection of the public, while the Swiss National Accident Insurance Office supervises those in which the primary concern is protection of workers.

The principal Nuclear Safety Division on the other hand is responsible for inspecting the safety of nuclear installations. The Federal Office of Public Health and the Federal Energy Office, each in its own sphere, control the import and export of radioactive substances as well as equipment and objects containing such substances.

Other powers

The Radiation Protection Section of the Federal Office of Public Health is responsible for the collection and dispatch of radioactive waste from industrial, research, and medical activities. It sends a circular to listed waste producers to inform them that waste will be collected from the centre which has been assigned to them. The Office works in co-operation with the Paul-Scherrer Institute with respect to the collection and conditioning of this waste. The Office represents the central administration responsible for collecting radioactive waste other than that from nuclear installations, within the National Corporation for the Disposal of Radioactive Waste (NAGRA).

The Office also organises, along with other federal services and non-governmental organisations, training and advanced courses in radiation protection. It is responsible for the payment of subsidies allocated by the Confederation to private institutions organising such courses.

g) *Federal Office of Education and Science (OFES)*

The Federal Office of Education and Science (*Office fédéral de l'éducation et de la science* – OFES), set up in 1968, replaced the Delegate for Atomic Energy Questions. It is part of the Federal Department of the Interior where, together with the Federal Council of *Ecoles polytechniques*, it forms part of the Science and Research Group, whose activities are administered by a directing body (*état-major*).

The OFES co-ordinates research activities carried out in university circles, the private sector, and by government authorities. It represents the government in bodies carrying out fundamental and applied research. It also deals with research into thermal nuclear fusion, and high and medium-energy nuclear physics.

h) *Other authorities*

Other federal departments are called on to regulate questions falling within the nuclear energy field, and in particular: the Federal Department of Justice and Police, for the transport by road of dangerous goods, and in relation to public protection measures; the Federal Department of Foreign Affairs and the Federal Economics Department for the export of nuclear materials of particular significance; the Department of Public Protection and Sport for radiation protection on behalf of the army; and the Federal Finance Department with respect to legislation on nuclear measurement units.

2. *Advisory Bodies*

a) *Federal Commission for the Safety of Nuclear Installations*

i) *Legal status*

The Federal Commission for the Safety of Nuclear Installations (*Commission fédérale de la sécurité des installations nucléaires*) was set up by Ordinance of the Federal Council dated 13 June 1960. The Commission, which is administratively attached to the Federal Energy Office, acts as an advisory body to the Federal Council and the Federal Department of the Environment, Transport, Energy and Communications [Ordinance of the Federal Council of 13 June 1980, Section 1; Act of 21 March 2003, Section 71].

ii) Responsibilities

The Commission's functions were redefined by a Federal Council Ordinance of 14 March 1983 which repealed the 1960 Ordinance. The Commission is henceforth less involved with operational aspects. In particular, the Commission studies fundamental nuclear safety issues, monitors the operation of nuclear installations and gives its opinion on applications for general licences as well as for licences for the construction, start-up, operation and modification of nuclear installations [Act of 21 March 2003, Section 71].

In particular, it stipulates whether, in view of experience gained and the state of the art of science and technology, all necessary measures of a reasonable nature have been taken to protect man and the environment from ionising radiation. The Commission may restrict itself to dealing with basic nuclear safety questions, or with points on which a project diverges from solutions which have proved satisfactory in other cases.

With regard to the protection of installations against attacks by third parties, it gives its opinion on the technical aspects of design and operation inasmuch as they are connected with nuclear safety. It comments on the expert reports prepared on this topic by the principal Nuclear Safety Division and by other federal services.

The Commission monitors the operation of nuclear installations in Switzerland and abroad in relation to the basic aspects of nuclear safety. It suggests measures it considers necessary and which may reasonably be required in the light of experience and the current state of science and technology [Section 3].

The Commission provides an opinion when nuclear safety legislation is being drawn up or amended. It follows the development of regulatory requirements concerning nuclear safety. It may recommend the adoption or amendment of requirements applying to nuclear power plants, and may participate in any work of this kind carried out by other bodies.

The Commission analyses basic nuclear safety questions concerning installations themselves, and studies the general difficulties involved in assessing their degree of safety. It may recommend measures to increase the safety of installations, and improvements to the licensing procedure and the supervision of the operation of installations.

It follows nuclear safety research at home and abroad, and proposes relevant research that could be carried out in Switzerland, or suggests that Switzerland be involved on a bilateral or multilateral basis in the implementation of projects.

The Federal Department of the Environment, Transport, Energy and Communications, and the Federal Energy Office may submit other nuclear safety questions to the Commission for consideration.

iii) Structure

The Federal Commission for the Safety of Nuclear Installations comprises a maximum of thirteen nuclear experts, proposed by the Federal Department of the Environment, Transport, Energy and Communications, and nominated by the Federal Council. The chairperson of the Federal Commission is appointed by the Federal Council on the proposal of the said Department. Members of the Commission carry out their duties in a private capacity, and not as part of their main professional

activities. They are not bound by any instructions and may not nominate a substitute to take their place.

In order to carry out its duties properly, the Federal Commission may set up internal permanent sub-commissions and specialised groups of experts. If necessary, it may, with permission of the Federal Energy Office, invite external experts to assist with its work.

Representatives of the principal Nuclear Safety Division (DSN) may attend meetings and inspections of the Federal Commission.

The quorum for discussions within the Federal Commission is fixed at two-thirds of its members, and its decisions are taken on a simple majority basis. Should there be an equal number of votes on each side, the chairperson of the Federal Commission has the casting vote.

The Federal Commission's work is confidential and an obligation of professional secrecy is imposed on experts. The chairperson of the Federal Commission may nevertheless, with the permission of the Federal Department of the Environment, Transport, Energy and Communications, send inspection results to the competent cantonal or local authorities, and to the insurers of the installation involved. The Federal Commission for the Safety of Nuclear Installations is served by a secretariat attached to the principal Nuclear Safety Division.

b) Federal Commission for Protection against Radiation

The Federal Commission for Protection against Radiation (*Commission fédérale de la protection contre les radiations*) is attached to the Federal Department of the Interior.

i) Responsibilities

The Commission is responsible for giving general advice to the Federal Department of the Interior on questions relating to the protection of the population against hazards from ionising radiation. Thus, the Commission is consulted in particular on the changes or additions to be made to maximum permissible dose definitions for persons exposed to radiation, and on guideline activity levels and surface contamination in the environment.

If there are medical grounds for removing, whether temporarily or permanently, a person occupationally exposed to ionising radiation from his workplace, the Federal Department of the Interior must ask for the Federal Commission's opinion on the matter.

Guidelines relating to requirements for the protection of patients exposed to radiation for medical examination purposes are adopted by the Federal Department of the Interior.

ii) Structure

Members of the Federal Commission come from university and medical circles and from the Administration.

c) *Federal Commission for the Monitoring of Radioactivity*

The Federal Commission for the Monitoring of Radioactivity (*Commission fédérale de surveillance de la radioactivité*), which is under the authority of the Federal Department of the Interior, keeps a permanent check on radioactivity in the environment. It regularly informs the Federal Council of the results of its monitoring activities, and prepares information to be given to the public in the event of an increase in the level of ambient radioactivity. If necessary, the Federal Commission may propose to the Federal Council the measures that should be taken to ensure the protection of the population. Work carried out involving unsealed radioactive sources and taking place outside a firm's premises, must be notified to the Federal Commission by the Federal Office of Public Health when there is a risk of contamination of the environment.

Members of the Federal Commission for the Monitoring of Radioactivity include experts from university circles and from the Federal *École polytechnique*. They are appointed by the Federal Council on the proposal of the Federal Department of the Interior.

d) *Federal Emergency Organisation on Radioactivity*

In the event of a dangerous increase in radioactivity, a Federal Emergency Organisation on Radioactivity (*Organisation d'intervention en cas d'augmentation de la radioactivité – OIR*) is called upon to follow developments in the situation and to propose or recommend appropriate protection measures. The organisation is headed by a Radioactive Steering Committee (*Comité directeur de la radioactivité – CODRA*) which is under the aegis of the Federal Department of the Interior. The Warning Committee has at its disposal an alarm post, a monitoring centre and other resources such as the National Alarm Centre.

Members of the CODRA include representatives from federal departments, government services, the cantons and directors of the different federal offices and other bodies. CODRA also has at its disposal various federal commissions.

e) *Technical Commission for the Practical Application of Ionising Radiation*

The Technical Commission for the Practical Application of Ionising Radiation (*Commission technique pour l'application pratique des radiations ionisantes*) reports to the Federal Department of the Environment, Transport, Energy and Communications. It is responsible for giving advice to the Confederation and interested firms on the subject of Swiss participation in national or international projects concerning the use of ionising radiation.

3. Public and Semi-Public Agencies

a) *Paul-Scherrer Institute (IPS)*

On 30 November 1987, the Federal Council decided on the merger, on 1 January 1988, of the Federal Institute for Reactor Research (IFR) and the Swiss Institute for Nuclear Research (ISN), into a research establishment, the Paul-Scherrer Institute (*Institut Paul-Scherrer – IPS*). While the IFR and the ISN worked on fundamental research and applied research covering industrial applications, respectively, the Paul-Scherrer Institute is more of a multi-disciplinary research establishment for natural sciences and engineering [Ordinance of 13 January 1993, Section 2].

i) *Legal status*

The IPS is a Confederation research establishment governed by public law. This independent legal entity is answerable to the Federal *Écoles polytechniques* Council.

ii) *Responsibilities*

The Paul-Scherrer Institute is entrusted with research activities in the following fields:

- nuclear physics and particle physics;
- radiation medicine, radiobiology and radiological hygiene;
- research on solids and material sciences;
- nuclear energy techniques (especially relating to nuclear safety and radioactive waste disposal);
- non-nuclear energy techniques and environmental sciences related to energy.

It is thus responsible for the development of large facilities for complex research. The Paul-Scherrer Institute is also competent as regards education and training in colleges (*hautes écoles*), with which it has close ties. The IPS may make its research facilities available to such colleges which may also manage laboratories jointly with the IPS.

The Institute also provides various services to the government and to other public bodies and the economy, in particular in the fields of nuclear safety, radioactive waste disposal and environmental protection in relation to energy use. The IPS may advise federal bodies and carry out research on their behalf. It also provides support to the supervisory authorities responsible for nuclear safety.

Lastly, the Institute collaborates with the international scientific community in preparing joint research and development programmes.

iii) *Structure*

The Paul-Scherrer Institute is divided into different research and administrative sectors. The Federal *Écoles polytechniques* Council is responsible for organising the administration of the Institute. Management is entrusted to the following bodies:

- the Federal *Écoles polytechniques* Council;
- an Advisory Committee; and
- the Management of the Institute.

The Federal *Écoles polytechniques* Council directs and generally supervises the IPS and its installations. For this purpose, it draws up internal rules and drafts guidelines for the efficient functioning of the Federal Institute.

After consulting the Committee, the Council approves the annual programme of work prepared by the Management of the Institute.

The Advisory Committee, composed of between five and nine members, assists the Federal *Écoles polytechniques* Council with important questions for IPS activities. The Council appoints the chairperson and the members for a period of four years.

The Management of the Institute includes the Director and other members who are answerable to him and who are responsible for specific sectors as determined by the *Écoles polytechniques* Council. The Director administers the IPS and has overall responsibility for the establishment's management and safety. He is answerable in this to the *Écoles polytechniques* Council, which lays down the tasks and responsibilities of the Management.

iv) *Financing*

Fees are payable for the Institute's services and must cover the cost thereof. The *Écoles polytechniques* Council decides on what fees should be charged, after hearing the opinion of the Federal Finance Department.

b) *Fund for the Decommissioning of Nuclear Installations*

i) *Legal status*

Provision was made in the Federal Order of 6 October 1978 concerning the Atomic Energy Act for the setting up of a fund for financing the decommissioning and dismantling of nuclear installations no longer in service (*Fonds pour le financement de la désaffectation et le démantèlement des installations nucléaires mises hors service*). This fund was set up on 1 January 1984 and is managed under the supervision of the Federal Council. It has been given its own legal personality, and has its headquarters in Bern.

Chapter 7 of the Act of 21 March 2003 contains more specific provisions: it separates the Decommissioning Fund from the Waste Disposal Fund, both of which still report to the Federal Council and have legal personality.

ii) *Responsibilities*

The fund for financing the decommissioning and dismantling of nuclear installations no longer in service was set up to cover costs arising from the decommissioning and dismantling of nuclear installations no longer in use and from the management of the waste produced.

The Decommissioning Fund established by the Act of 21 March 2003 shall ensure the financing of the decommissioning and dismantling of nuclear installations withdrawn from service, and that of the disposal of the waste produced thereby (decommissioning costs). The Waste Disposal Fund shall ensure the financing of the disposal of radioactive operating waste and of spent fuel assemblies, after withdrawal from service of nuclear installations (disposal costs) [Section 77].

iii) *Structure*

The fund for financing the decommissioning and dismantling of nuclear installations no longer in service is administered by a Commission with a maximum of eleven members appointed by the

Federal Council and including representatives of operators, the Confederation, and various economic circles.

Each fund established by the Act of 21 March 2003 shall be administered by a board acting as a directing body and nominated by the Federal Council [Section 81].

iv) Financing

The resources of the fund for financing the decommissioning and dismantling of nuclear installations no longer in service are constituted by the contributions paid by the owners of nuclear installations subject to the Ordinance of 5 December 1983 concerning the Fund for the Decommissioning of Nuclear Installations. Every three years, the Commission of the fund fixes the annual amount due by each owner.

The boards administering the funds established by the Act of 21 March 2003 shall set the amount of contributions to be paid by each contributor to the funds.

c) National Corporation for the Disposal of Radioactive Waste (NAGRA)

i) Legal status

The National Corporation for the Disposal of Radioactive Waste – NAGRA (*Société coopérative nationale pour l'entreposage des déchets radioactifs*) is a private co-operative company set up in 1972 by the waste producers (the Confederation and six electricity companies), to undertake, at national level, the study and final disposal of the various categories of radioactive waste.

ii) Responsibilities

NAGRA is responsible for locating sites suitable for the storage of radioactive waste.

In conjunction with the competent federal authorities and the Paul-Scherrer Institute, NAGRA undertakes research programmes with a view to establishing new permanent repositories for waste storage. This research concerns in particular the physical and chemical properties of the geologic formations envisaged as potential storage sites, the safety of solidified waste, packaging material, proposed repositories, the organisation of storage sites and the identification of new ideas for the safe disposal of waste.

To ensure the exchange of information and to promote co-operation in the field of waste management, NAGRA maintains contact with similar organisations in foreign countries.

iii) Structure

All Swiss producers of waste of nuclear origin, including the Confederation, are members of NAGRA. The Confederation participates on two counts, first as a producer of waste from research reactors and from the processing of radioactive materials, and secondly as the collector of waste produced in the fields of industry, research, medicine and education.

The Board of Directors of NAGRA is composed of persons from Ministerial Departments and from industry circles concerned with the disposal of radioactive waste. Particular responsibility for studying the technical and safety aspects of waste processing has been given to a Technical Commission made up of specialists in the nuclear energy field. To accomplish its task, the Commission may call upon external experts.

iv) Financing

NAGRA is a non-profit making co-operative organisation. Expenses are paid out of capital and members' subscriptions. The cost of radioactive waste disposal is borne entirely by the producers of the waste concerned.