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## 5. Annexes

### 5.(a) List of nuclear installations

CAORSO NPP is within the scope of the Nuclear Safety Convention as it still fits with the definition of Nuclear Installation given at the art. 2 of the Convention, although the fuel is going to be discharged from the vessel to the pools and decommissioning programs are going to be defined.

Hereinbelow, under the Annex 5.(b), the main data of these NPPs are reported.

### 5.(b) Data on Nuclear installations

Name and Location	Type	Owner	Installed EP [MWe]	Date of Start Up		Shut Down
				First criticality	Commence . Operation	
Garigliano	BWR	ENEL	160	05/06/1963	01/01/1964	08/08 1978
Latina	GCR	ENEL	210 (160 <sup>1</sup> )	27/12/1962	01/01/1964	26/11/1986
Caorso	BWR	ENEL	882	31/12/1977	28/11/1981	24/10/1986
Trino	PWR	ENEL	270	21/06/1964	01/01/1965	21/03/1987

Note 1 - the power was reduced with respect to the design value.

#### 5.(b)1.Garigliano NPP

- Installed electrical power: 160 MW
- Date of first criticality: 05/06/1963; date of the beginning of Commercial Operation: 01/01/1964; date of final Shut Down: 08/08/1978.
- Necessary licenses with the date of application and date of granting: Decree n° VII-219 of MICA (Ministry of Trade and Industry); date: 30/04/1985. This Decree authorises the operations aimed to achieve the state of the Safe of the NPP.
- Only preliminary operations such as treatment and conditioning of the technological waste are carried out.
- 50 men involved in the activities

#### 5.(b)2.Latina NPP

- Installed electrical power: At the beginnings was 210 MWe, later it was reduced to 160 to avoid problems of metals oxidation
- Date of first criticality: 27/12/1962; date of the beginning of Commercial Operation: 01/01/1964; date of final Shut Down: 26/11/1986.

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- Necessary licenses with the date of application and date of granting: Decree VII n°305 of MICA (Ministry of Trade and Industry); date: 13/04/1991. This Decree authorises the operations aimed to achieve the state of the Safe of the NPP.
  - Present status of the decommissioning project: only decontamination activity and preliminary operations such as treatment and conditioning of the technological waste are carried out.
  - Total man power needed for the decommissioning project: 80 men are involved in the activities;

### **5.(b)3.Caorso NPP**

- Installed electrical power: 882 MW.
- Date of first criticality: 31/12/1977; date of the beginning of Commercial Operation: 28/11/1981; date of final Shut Down: 24/10/1986.
- ENEL presented a first application for decommissioning activities in the 02/08/1991 and then a new application in the 06/06/1997 according to the Legislative Decree 230/1995 which regulate the decommissioning process in Italy.
- The NPP is regulated as in normal exercise.

### **Caorso Plant more detailed description**

The Caorso NPP is a single unit station equipped with a boiling water reactor supplied by Ansaldo Meccanico Nucleare SpA/General Electric Technical Services (USA). The target output is 2651 MW(thermal), 882 MW(gross electrical) and 860 MW(net electrical). The reactor core comprises 560 fuel assemblies, 137 control rods, five neutron sources and instrumentation. Each fuel assembly contains 63 fuel rods and one water rod in a central position of the 8 x 8 pattern. Primary water recirculation through the core is by means of two external recirculation loops equipped with variable speed pumps to regulate reactor power as well as regulating it by control rod positioning.

Construction of the plant started in 1970, first criticality was reached on 31 December 1977 and commercial operation commenced on 1 December 1981; the plant had therefore been in commercial operation for more than five years at the time of the OSART mission. Its operating record with respect to scrams and availability corresponds to the average figures reported for comparable plants (in terms of vendor, size and the age). The number of unusual events reported to the regulatory authority was also in the normally expected range and none of the events was of a particular nature worthy of further discussion. Individual and collective radiation exposure of the work force were low and mostly lower than average, as were the amounts of radioactive effluent discharged to the environment and of solid waste generated.

Caorso has safety features to cope with design basis accidents, including a pressure suppression Mark 2 containment made of reinforced concrete, has redundant emergency core cooling systems comprising a core spray system, a residual heat removal system, a high pressure injection and to implement the approved plans. The examples reviewed in detail indicated that proposed modifications have been handled and implemented in conformity with existing procedures.

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#### **5.(b)4.Feedback of operating experience**

Reports from events at other NPPs are received and screened by ENEL headquarters. A random review gave an impression that Caorso NPP receives most of the relevant external information. A procedure defines how the external information should be evaluated and feed back.

Distribution of external reports is limited to those persons who evaluate them and feed back the information that might be needed for possible plant modifications.

Operating experience at the plant is documented in logbooks and reports. Several reported events were reviewed to check how they had been evaluated and what corrective actions had been taken. In all instances prompt actions had been taken to prevent the recurrence of such events. As a first step, similar parts of the plant have usually been inspected. In many events, the second step was to change the original design or operating practice. Reporting criteria corresponded with IAEA-OECD/NEA guidance, and the reporting rate reflects the operating history and is in the same range as at comparable NPPs.

#### **5.(b)5.Trino NPP**

- Installed electrical power: 270 MW
- Date of first criticality: 21/06/1964; date of the beginning of Commercial Operation: 01/01/1965; date of final Shut Down: 21/03/1987.
- Necessary licenses with the date of application and date of granting: Decree n° 384 of MICA (Ministry of Trade and Industry); date: 17/01/1995. This Decree authorises the operations aimed to achieve the state of the Safe of the NPP.
- 100 men are involved in the activities;

### **5.(c) *Comprehensive Description of the Italian Legislative and Regulatory Framework***

#### **5.(c)1.LEGISLATION**

##### **5.(c)1.1.Introduction**

In Italy the regulatory regime for nuclear activities is largely based on two enactments: The first is the Act no. 1860 of 31 December 1962 on the Peaceful Uses of Nuclear Energy; the Act introduced a general regime based on a series of administrative and procedural requirements including notifications and licences. Amendments were subsequently made to the Law under which small quantities of special fissile materials, raw materials and other radioactive materials laid down by Ministerial Decree were no longer subject to such formalities [Act no. 1008 of 19 December 1969 and Ministerial Decree (DM) of 15 December 1970].

The second basic text is Legislative Decree no. 230 of 17 March 1995, replacing the Decree of the President of the Republic (DPR) no. 185 of 1964. The new Decree, which came into force on 1 January 1996, provides for the transposition of six Euratom Directives concerned with radiation protection. Moreover, it enacts supplementary provisions due to the experience made in the application of the previous Presidential Decree no. 185 of 1964 dealing with matters related to the safety of nuclear installations, such as decommissioning, and the protection of workers and the general public against the hazards of ionising radiation.

A series of Ministerial Decrees have been made in implementation of the Act no. 1860 of 1962 and other decrees are expected to implement Decree no. 230 of 1995, some of which have been already issued. In the meantime some of the decrees made in implementation of DPR no. 185/1964 remain in force. These enactments, in addition to other acts, decrees and regulations which do not concern nuclear activities exclusively, constitute the basic nuclear legislation in Italy.

At the end of the 1980s, important changes were made to the previous legislating procedure. The key stage in this process was the adoption of Act no. 86 of 9 March 1989 under the terms of which Italy can incorporate European Union directives, including those of Euratom, into its internal legislation by means of a simplified procedure. More precisely, Parliament each year adopts a Community Act reporting on the situation and authorising the Government to promulgate the measures required to incorporate Community law. This procedure allows national rules to be amended or repealed if necessary, as well as the adoption of new provisions. The essential aim of this procedure to accelerate the incorporation of Community regulations is to bring legislation up to date as quickly as possible.

With regard to radiation protection, the first Act was adopted on 30 July 1990 [Act no. 212], providing, inter alia, for the implementation of Euratom Directives 80/836, 84/467 and 84/466. Since the Community Law for the year 1990 [no. 428 of 29 December 1991] did not refer to these Directives, in order to allow the Government additional time for their implementation, they were incorporated into the Community Law for the year 1991 [no. 142 of 19 February 1992]. The above Directives have been supplemented from time to time by the most recent Euratom Directives concerning radiation protection, i.e., Directives 89/618, 90/641 and 92/3 [Community Law for 1993 no. 146 of 22 February 1994]. The new Decree no. 230 mentioned above is, therefore, based on the last Community Law mentioned. Furthermore, as far as institutions are concerned, mention should be made of Act no. 933 of 11 August 1960 setting up the National Nuclear Energy Commission (Comitato Nazionale per l'Energia Nucleare CNEN). The Commission was first restructured in 1971 [Act no. 1240 of 15 December 1971] and again subsequently, with a Act of 1982 changing its name and giving it broader powers. The CNEN became the ENEA, namely the National Commission for the Research and Development of Nuclear and Alternative Energy Sources (Comitato Nazionale per la Ricerca e per lo Sviluppo dell'Energia Nucleare delle Energie Alternative). The ENEA was given additional responsibilities in both the nuclear and energy fields (except for hydrocarbons) [Act no. 84 of 5 March 1982]. However, the latter reform was of short duration. Act no. 282 of 25 August 1991 redefined ENEA's goals and responsibilities. ENEA retained its acronym but changed its name to the National Agency for New Technologies, Energy and the Environment (Ente per le Nuove Tecnologie, l'Energia e l'Ambiente). In addition to its previous responsibilities as regards research in the field of nuclear safety and radiation protection, it now dealt with environmental questions and new technologies [See infra, Part II: Institutional Framework].

A substantial change came in 1994 when Act no. 61 set up ANPA, the National Agency for the Protection of the Environment (Agenzia Nazionale per la protezione dell'Ambiente) that inherited the duties, responsibilities and personnel of the former Central Directorate for Nuclear Safety and Radiation Protection. This Directorate was responsible within the ENEA of licensing and inspections as regards nuclear and radiation protection aspects. The ANPA represents now the major part of the regulatory body system governing, besides the Environment, the field of nuclear safety and radiation protection.

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### **5.(c)1.2.Mining Regime**

Section 2 of Act no. 1860 of 1962 on the peaceful uses of nuclear energy provides that concessions for the mining of radioactive ores (listed in the fourth paragraph of Article 197 of the Euratom Treaty) are granted in accordance with the provisions of a Royal Decree of 1927 on mines [as amended by DPR no. 620 of 28 June 1955]. This Decree lays down rules for the granting of permits for prospecting and mining concessions for ores in general. Concessions are granted following consultation with the Higher Council for Mines.

Furthermore, the protection of workers in mines against ionising radiation is regulated by the abovementioned Legislative Decree no. 230 and, in greater detail, by a Ministerial Decree of 13 May 1978 (made in application of the abovementioned Presidential Decree no. 185 of 13 February 1964) relating to radiation protection of workers in mines. These provisions are described below, in Section "Radiation Protection".

### **5.(c)1.3.Radioactive Substances, Nuclear Fuels and Nuclear Equipment**

Regulations governing activities connected with radioactive substances, nuclear fuels and nuclear equipment are contained in Act no. 1860 of 31 December 1962 on the peaceful uses of nuclear energy, in decrees implementing DPR no. 185 of 13 February 1964, as well as in Legislative Decree no. 230 of 1995.

The Minister for Industry, Commerce and Crafts is the competent authority as regards administrative requirements for such activities. Under the Act no. 1008 of 19 December 1969 (amending the framework of the 1962 Act), persons in possession of small quantities of special fissile materials, raw materials or other radioactive materials are exonerated, by Ministerial Decree of 15 December 1970 (in implementation of Act no. 1008) from the general declaration requirement and from some authorisation. This gives more flexibility than the procedure under the 1962 Act which required persons in possession of the abovementioned materials to report them to the Minister within five days, irrespective of the quantity of materials held [Section 3].

However, in relation to radioactive materials, this same Section of the 1962 Act requires a declaration only from persons in possession of radioactive materials such that the total radioactivity exceeds the levels laid down in one of the decrees implementing DPR no. 185 of 1964.

Under the terms of Presidential Decree no. 185 of 1964 the declaration must also be made to the local authorities of the National Health Service and to other relevant authorities in each region for amounts of radioactivity smaller than those for which declaration is required to the Ministry. The declaration is also required for radiation emitting equipment. An implementing decree of the new Legislative Decree no. 230, will lay down new conditions in which materials and equipment must be declared; duty of declaration to new State organs is also provided for.

Section 13 of Act no. 1860 of 1962 lays down the procedure regulating the use of radioisotopes. All such use requires a licence from the Minister for Industry, Commerce and Crafts. In addition, other Ministers are involved depending on the use to which the substances are to be put. This provision has been supplemented by a Ministerial Decree of 1 March 1974 which contains detailed instructions on the information to be included in licensing applications: information relating to the applicant, the intended use of the radioisotopes (industrial, agricultural, medical or scientific), the location of the premises involved, the qualification of personnel, etc.

Moreover, Legislative Decree no. 230 has provided for a new type of regulation of the use of radioactive materials and radiation emitting devices; use is subdivided into two categories (A and B) requiring a licence from the Minister for Industry (category A) and clearance certificates from the Prefect of the province (category B) with the agreement of other competent authorities. The circumstances and procedures relative to this subdivision into categories will be laid down in a decree of the Prime Minister, made in agreement with the ministries concerned. However, competent authorities for medical uses will be determined under regional legislation. Use includes installations for buying and selling radioactive materials together with activities involved in use, such as handling, treatment and the eventual disposal of wastes into the environment [Sections 27 to 29].

### **5.(c)1.4.Nuclear Installations**

#### **a) Licensing and inspection**

The legislative provisions and regulations applying to the construction and operation of nuclear installations in Italy are embodied essentially in the Act no. 1860 of 1962 on the Peaceful Uses of Nuclear Energy and mostly repeated in legislative Decree no. 230/95 containing technical and administrative licensing procedures as regards nuclear safety and radiation protection.

It should be pointed out that while nuclear electricity generating plants are excluded from the scope of the 1962 Act, by virtue of Decree no. 230, they remain subject to licensing by the Ministry of Industry, Commerce and Crafts, with the National Electricity Company (Ente Nazionale per l'Energia Elettrica ENEL) being responsible as the operator. The prior opinion of the ANPA is also required.[See section 5.(c)2. "Institutional Framework"]

When filing a licensing application, the operator must submit detailed documentation concerning the construction of the installation, arrangements for releasing and disposing of radioactive waste, the cost and time required for construction and the financial security at his disposition. In short, the operator must show that he possesses the technical and financial resources required to ensure maximum safety.

A special administrative procedure for the prior selection of the site for nuclear electricity generating plants was introduced by Act no. 393 of 2 August 1975. The 1975 Act establishes a special siting procedure involving the co-operation of the CIPE (Interministerial Committee for Economic Planning), ENEA and the regional and local authorities. It also takes into consideration the administrative decentralisation policy giving the Regions wider responsibilities in environmental protection and land use planning.

The procedure introduced by Act no. 393 of 1975 was at the centre of the referendum debate on the construction of nuclear power plants. The outcome of the referendum led to the repeal of paragraph 13 of the single Section of Act no. 8 of 10 January 1983 (which amended the Act of 1975). This provision specified that if, in the context of the siting procedure for electricity generating power plants, the local authorities could not agree within a period of 150 days on a suitable site, the siting decision was to be taken by the CIPE. Following the repeal of this provision, it is once again Act no. 393 of 1975 which is applicable [Section 2]. This provides that in the absence of agreement between the Regions, the decision as to a nuclear site will be taken by Parliament on the proposal of the Minister for Industry, Commerce and Crafts.



The referendum did not, on the other hand, amend paragraph 14 of that Section of the 1983 Act, which requires ENEL to inform the public of those communes concerned by a nuclear project about environmental protection issues.

As far as the licence itself is concerned, the 1975 Act did not change the technical and administrative procedures for the licensing of nuclear installations as provided for by Decree no. 185 of 1964, nor those of Decree no. 230/95 that replaces it. The provisions regarding Nuclear Installations are the same in both Decrees; in Legislative Decree no. 230, moreover, special provisions for decommissioning were added. Under Section 36 of Legislative Decree no. 230, the operator submits the plans for the construction of the installation to the Minister for Industry, Commerce and Crafts who, after obtaining the opinion of ANPA, decides for or against licensing by means of a Decree.

Following delivery of the clearance certificate (or the construction permit), construction proceeds under the technical supervision of the ANPA. The operating licence is then granted on satisfactory completion of the non nuclear and nuclear tests.

Specific provisions concerning the decommissioning of nuclear installations represent a highly important innovation in Decree no. 230, since no such provision appears in DPR no. 185/1964, and this omission had led the competent authorities to apply, by a not always easy analogy, the legal instruments relative to construction and operation. The operations involved in decommissioning are now licensed, as appropriate, in stages set forth in the provisions in question. The Ministry for Industry determines the requirements concerning the status of the installation and of the site on the basis of a final report provided by the operator.

Section 10 of Decree no. 230 of 1995 governs the inspection of activities covered by this Decree and by the Act no. 1860 of 1962. It is the responsibility of the ANPA to check that the installation is constructed in accordance with the initially approved project and to supervise the carrying out of the nuclear tests. To this effect, the ANPA inspectors, who are appointed by the ANPA Chairman, are vested with wide powers, both as regards inspection of the installations and access to documents. They are also empowered to undertake regular inspections of installations during operation. The competent authorities were also given the same powers of inspection under Decree no. 230 (Inspectorate of Labour, National Health Service, and so on) that they had under Presidential Decree no. 185. Under Act no. 349 of 8 July 1986 setting up the Ministry of the Environment, this Ministry is responsible for carrying out technical controls on the state of air, water and land pollution [Section 8].

### ***b) Protection of the environment against radiation effects***

Although the Act setting up the Ministry of the Environment [Act no. 349 of 8 July 1986] contains no express provisions on nuclear activities and radiation protection, the role of the new Ministry in the nuclear field is defined implicitly in certain of the general provisions contained in the 1986 Act.

Section 6 of the Act describes, in a provisional manner, the impact assessment procedure to which installations capable of producing significant changes to the natural environment are subject.

It is the responsibility of the Minister for the Environment, after obtaining the opinion of the Minister for National Heritage and of the Region directly concerned, to decide whether the project is compatible with environmental protection. In pursuance of Section 6(2), an implementing Decree sets out the categories of installations subject to impact studies

[Decree no. 377 of 10 August 1988]. The list includes nuclear power plants and other nuclear reactors (except for research reactors with a capacity less than 1 kW of constant thermal heat) as well as facilities for the long-term storage or final disposal of radioactive waste. The Decree also specifies that environmental impact studies must be carried out prior to applications for licences, clearance certificates and, in all cases, allocation of work contracts. Environmental impact studies must include information relating to:

- the possible siting of the installation, having due regard to the effects on the surrounding environment;
- the disposal sites to be used for liquid waste, and to the characteristics and quantities of solid, liquid and gaseous waste generated by the installation;
- limitation and emergency plans in the event of damage to the environment caused during the construction or operation phases of the installation.

After receiving the backing of the Minister for the Environment, the project has to be published in two newspapers, one local and the other national.

### ***c) Emergency response***

In the context of the general protection of the public, a Presidential Decree of 1981 provides for aid and assistance for the public in the event of a disaster. The provisions of this Decree are of general application and therefore cover nuclear accidents. The Decree sets up a framework for aid and assistance at regional level, having regard to the process of decentralisation which followed the creation, in 1972 of autonomous regional authorities. In 1992 Act no. 225 provided for the establishment of the National Service for Civil Protection.

The regime applicable to emergency situations has been substantially modified since specific new provisions concerning nuclear emergencies came into force.

Like Presidential Decree no. 185 of 13 February 1964, Chapter X of Legislative Decree no. 230 deals with nuclear emergencies [Sections 115 to 135]. These Sections describe the procedure to be followed in preparing "external emergency plans" to be put into action when an accident occurs in a nuclear installation and involves a risk for the local population. These provisions deal essentially with information required as to the content of the plan and its approval, and with the obligation to declare a state of emergency and to inform neighbouring regions of the danger. Chapter X is in a revised form, by comparison with the previous regime, owing to the fact that it incorporates the nuclear emergency plans into national planning of protective measures in the event of a radiation emergency covering the entire country.

This form of planning is the responsibility of the Department for Civil Protection assisted by the ANPA. A decree of the Prime Minister (on the proposal of the Minister for Health and in consultation with the other ministries and organisations concerned) lays down the reference dose levels for measures to be adopted in the event of an emergency. Provisions have also been introduced which incorporate Euratom Directive no. 618/89 concerning public information. Moreover, a standing committee of the Ministry of Health is charged with preparing, updating and disseminating this information. Finally, a centre for preparing and evaluating data concerning radiation emergencies has been established at ANPA H.Q.. In this context, it should be noted that, at the international level, Italy has ratified the 1986 Vienna Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency [Act no. 92 of 9 April 1990].

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### **5.(c)1.5.Trade in Nuclear Materials and Equipment**

#### 5.(c)1.5.1.General provisions

A Decree of the Minister for Foreign Trade and of the Treasury Minister of 6 June 1976 lays down the rules applying to the import of goods. This Decree brings together in a single enactment the rules applying to the import of goods into Italy and specifies which goods require an import licence. These are listed in Annex I of the Decree and include in particular, radioisotopes, radiation emitting equipment, instruments for measuring ionising radiation, particle accelerators, etc.

Trade in radioactive ores, source materials and substances is subject to a licence from the Minister for Industry, Commerce and Crafts. Import and export licences, when such are required under the trade regulations applicable, are granted by the Minister for Foreign Trade after consultation with the Minister for Industry, Commerce and Crafts. The State has a right of pre-emption as regards source materials, a right which must be exercised within 30 days of the licence application [Section 4 of Act no. 1860 of 31 December 1962]. According to Act no. 1008 of 1969 modifying Act no. 1860, certain exemptions from Ministry of Industry licensing are provided for by the Decree of 15 December 1970 (implementing Act no. 1008).

Also, under the terms of Legislative Decree no. 230 of 1995, the import and production for commercial purposes of radioactive materials, products and equipment containing such materials are subject to prior notification to the Ministries of the Environment and Industry and other ministries concerned, as well as to the ANPA, except for certain exemptions which are determined by the Minister for Industry on the advice of these ministries and of this Agency [section 18].

All persons engaging in trade in ores, source materials and other radioactive materials must keep a special register containing records of their commercial operations [Section 20].

With regard to radiation protection as such, commercial operations are governed by Legislative Decree no. 230. Also, decrees made by the Minister for Health, in agreement with the Minister for Industry, in implementation of Section 98 of Legislative Decree no. 230, provide for specifying the activities which are exempt from the prohibitions laid down in this Section and those for which a licence can be granted. The main criterion used is that of the level of radioactivity of the products or equipment in question. The prohibitions apply to certain products and articles that contain radioactive materials (such as cosmetics, toys, lightning conductors, etc.), the manufacture, import, sale, use or possession of which are prohibited in principle.

Euratom Regulation no. 1493/93 of 8 June 1993 on shipments of radioactive substances between Member States of the European Union was incorporated into Italian law by a Circular of the Minister for Industry, Commerce and Crafts [Circular no. 228 of 20 October 1993]. These Community provisions were adopted to allow the national authorities responsible for controlling radioactive substances to maintain a level of information identical to that existing before the abolition of border controls within the Community.

Following the adoption of Legislative Decree no. 230 of 1995, which also provides for the implementation of Euratom Directive 92/3 on shipments of radioactive waste, Circular no. 228 remains in force only as concerns sealed sources, to which it applies subject to the modifications affecting the new regime of Legislative Decree no. 230. In this context, the Circular sets out the procedures to be followed relating to the type of commercial operation to

be undertaken and to the prior licences required. [For radioactive wastes, see infra, Section 7, "Radioactive Waste Management"].

### **5.(c)1.6.Radiation Protection**

Legislative Decree no. 230 of 1995 replaces DPR no. 185/64 as the fundamental text in Italy in connection with radiation protection. In furtherance of the general framework laid down by Act no. 1860 of 31 December 1962, this Decree also introduces a regime for supervising the safe conduct of nuclear activities and, in general, all activities involving the use of ionising radiation. This regime provides for a number of implementation Decrees made under it, in the same way as those made in implementation of DPR no. 185. Some of those decrees are extant, also under the form of technical annexes to the Legislative Decree no. 230.

Several examples may be mentioned. A Decree of the Prime Minister prescribes the numerical values and other conditions which determine the scope of application of Legislative Decree no. 230. This implementation Decree is made and updated on the proposal of the Ministries for the Environment and Health, in conjunction with the other ministries and embodies the views of the ANPA and of the other organisations concerned.

Another Prime Ministerial Decree (made under a similar procedure) lays down the maximum dose limits for workers and the public. These areas are covered, in the meantime, by Annexes to Legislative Decree no. 230, by decrees made under it and other decrees implementing Presidential Decree no. 185 [see supra, Section 1, "Introduction"]

#### **5.(c)1.6.1.Protection of workers**

As provided by the 1995 Legislative Decree, responsibility for the radiation protection of workers lies with the Ministry of Labour and Social Security (acting through the Labour Inspectorate [section 59]), the ANPA and the local authorities of the National Health Service [See 5.(c)2. Institutional Framework].

Any persons, including the State, the Regions, the Provinces, the Communes, public bodies, educational establishments and research laboratories, who, in the course of their work, expose workers to the hazards arising from ionising radiation must comply with the provisions of the 1995 Decree.

The general standards for the radiation protection of workers, like the Presidential Decree no. 185, are based upon the Euratom basic standards. These are embodied notably in the provisions for the adoption of the dose limits [Section 96] mentioned above. As to the present dose limits it must be emphasised that those extant in Legislative Decree no. 230 of 1995 anticipated the limits subsequently prescribed by Euratom Directive 96/29.

The Legislative Decree of 1995 also regulates work in mines where radioactive substances are present and, in particular, defines the obligations of employers in relation to the radiation protection of workers in the mining industry. The conditions in which these provisions are applied are laid down by a Decree of the Minister for Industry, who is also responsible for inspection activities to ensure protection against radiation risks.

In particular, special provisions have been introduced as regards the protection of foreign workers covered by Euratom Directive no. 90/641. This involves, inter alia, the establishment for each worker of a personal radiation log book with which he must be provided in compliance with the above Directive.

Finally, another very important innovation is the explicit inclusion of provisions allowing the ALARA principle to be applied to the employer's activities even though the justification and

ALARA principles were long in use in the Italian regulatory system before they were formally legislated into the Legislative Decree no. 230.

#### 5.(c)1.6.2. Protection of the public

The Legislative Decree no. 230 of 1995 also contains provisions on the protection of the public against ionising radiation. The Ministry of Health is responsible for such protection and must, in particular, control all sources of ionising radiation to avoid any contamination of the public and of the general environment [Section 97]. Regional and provincial Commissions were set up under Presidential Decree no. 185 to give their advice on the radiation protection and associated problems. Under the Legislative Decree no. 230 advisory bodies must now be set up in accordance with the provisions of regional laws.

In pursuance of Section 96 of the same Decree under the procedure mentioned above, dose limits and maximum permissible concentrations are laid down for the public in compliance with the Community Directives.

Other provisions concern the protection of patients undergoing radiology and nuclear medicine, in compliance with Euratom Directive no. 466/84. These provisions concern the qualification of staff, the criteria for and methods of using radiation in medicine, the inventory of radiological equipment, quality control measures, and so forth.

#### 5.(c)1.6.3. Protection of the environment

The most important provisions, relating expressly to the environment, are contained in Legislative Decree no. 230, namely Sections 100 and 104.

Section 100 provides that in the event of an operational accident involving radioactive substances and affecting the environment, the operator must intervene to prevent the risk of subsequent contamination or injury to persons. The Prefect of the Province and the local authorities of the National Health Service must be immediately informed.

Section 104 provides that the Ministry of the Environment is responsible for monitoring ambient radioactivity, while the monitoring of foodstuffs and drinks is entrusted to the Ministry of Health, with overall technical co-ordination by the ANPA [See 5.(c)2. Institutional Framework]. All monitoring is carried out by national and regional networks, the latter acting under directives issued by the abovementioned ministries.

The activities of the ANPA are also governed by relevant directives from these ministries, and by section 35 of the Euratom Treaty. Its functions include the co-ordination and standardisation of measurements, the introduction of new measuring stations, etc.

The situation described above is one result of the referendum held 18 April 1993 which abolished the powers of Local Health Units as regards the environment, entrusting these powers to the National Environmental Protection Agency and to other relevant departments and organisations concerned.

#### 5.(c)1.6.4. Radioactive Waste Management

Legislative Decree no. 230 of 1995 regulates radioactive waste management and disposal in a more precise manner than Presidential Decree no. 185 of 1964. In general, Section 102, establishes that these wastes must be managed in accordance with the rules of good practice and the instructions set out in the disposal licence; also, any person producing, treating, handling, using, dealing in or storing radioactive substances must conduct a whole series of assessments concerning the disposal of solid, liquid or gaseous radioactive waste

in order to ensure that the limits and the other conditions governing disposal into the environment are observed [Section 103]. Radioactive waste discharges must be licensed, as a rule, by the authorities responsible for licensing the installations where the waste is produced and discharged; in other words the licence for the installation also cover waste discharges from that installation.

That is so with nuclear installations as well as installations for use of radioisotopes. Where no licence is necessary for the installation, authorisation for waste disposal is given by authorities identified by regional legislation, while a decree of the Minister for the Environment, made in consultation with the Ministers for Health and Industry and taking into account the views of the ANPA, determines the upper limits beyond which a licence is required. Section 33 also requires a prior licence to be obtained from the Ministry of Industry to build and operate installations for the storage or disposal of radioactive wastes.

Legislative Decree no. 230 has also incorporated Euratom Directive 92/3 concerning the transfer of waste. A Circular of the Ministry of Industry (no. 236 of 28 October 1994) adopted in order to implement this Directive into Italian legislation, pending Legislative Decree no. 230, was essentially embodied in this Decree. Section 32 requires prior authorisation of transfer, import, export and transit of radioactive waste, in compliance with the Directive. This authorisation is the responsibility of the authorities who have jurisdiction over the activities with which the wastes are involved. The relevant procedure is laid down in a Decree of the Minister for Industry.

Other technical and administrative obligations are prescribed in the event of any serious contamination of the environment in connection with the use and disposal of radioactive substances. To be more precise, the Prefect, other competent authorities in the region and the ANPA must be informed of the occurrence of a dangerous incident and there is an obligation to take all the measures required to restrict contamination in non controlled areas and to prevent any risk to individuals and the public [Section 101]. A Decree made by the Ministers for the Environment and Health, incorporating the opinion of the ANPA, lays down the levels of serious contamination and other conditions governing the application of this section.

#### 5.(c)1.6.5.Non-proliferation and Physical Protection

Act no. 1860 of 1962 provides that holders of special fissile materials must report them to the Ministry of Industry, Commerce and Crafts. Responsibility for controlling such materials, hitherto a matter for the ENEA, is now assigned to the ANPA by Act no. 61/94 [see *infra*, Part II, "Institutional Framework"] which requires the Agency to verify compliance with the physical protection measures applicable to nuclear installation and substances.

In addition, a Ministerial Decree of 19 April 1979 set up an Interministerial Committee for the Physical Protection of Nuclear Installations and Substances. This Committee is responsible for laying down standards in relation to protection measures designed to prevent criminal action being taken against nuclear installations or substances.

The Committee also has the task of giving its opinion on the soundness of the plans each operator prepares to protect its installation and, if necessary, of suggesting changes.

At international level, Italy signed the Vienna Convention on the Physical Protection of Nuclear Material on 13 June 1980. This Convention entered into force in Italy on 6 September 1991, the date on which the instrument of ratification was deposited.

As regards non-proliferation, it may simply be noted that Italy is a Party to the Treaty on the non-proliferation of Nuclear Weapons. In addition, Italy has recently signed the Additional Protocol for the Safeguards Agreement during the IAEA General Conference of 21 to 25 September 1998.

#### 5.(c)1.6.6.Transport

The regulatory basis for the transport of radioactive and fissile material can be found in Act no. 1860 of 1962, as modified by Presidential Decree no.1704 of 30 December 1965, which require a licence from the Minister for Industry in conjunction with the Minister of Transport and Navigation. There is provision for certain exemptions in the Decree of 15 December 1970 (taken to implement Act no. 1008 of 1969 modifying Act no. 1860).

DPR no. 1704 of 1965 provides for the adoption of a regulation concerning safety and radiation protection in the transport of radioactive materials. According to Section 21 of Decree no. 230, this regulation is adopted by Decrees of the Minister of Transport and Navigation (incorporating the opinion of the ANPA) for the different modes of transport, in compliance with the Directives and recommendations of the European Union and the international agreements concerned with the transport of dangerous goods. All the provisions regarding the safety and radiation protection in the transport of radioactive material established by the different international modal organisations (ADR, RID, ICAO, IMO) and that are incorporated into our legislation by the instruments mentioned above originate in the "Regulation for the Safe Transport of Radioactive Material" issued by the IAEA.

Transport of radioactive materials by road is regulated by two Decrees promulgated by the Ministry of Transport and Navigation on 4th September 1996 and 15th May 1997, in application of European Directives, that aligned national provision into line with the ADR international standards as regards transport of dangerous goods by road, radioactive and fissile material included. Other Ministerial Circulars, concerning the transport of radioactive material, are published by the different Ministries, namely the Ministry of Transport and Navigation as regard technical conditions [ Circular D.G. no. 162 prot. 1772/4967/1 of 16 December 1996 ], the Ministry for Industry, Commerce and Crafts as regards the licensing procedure [ Circular no. 244/F of 26 May 1997 ] and the Ministry of Interior as regards public safety [ Circular no. 48 of 19 May 1965 ].

Transport of radioactive materials by rail is regulated by the Decree of Ministry of Transport and Navigation no.151/T of 3 October 1994 containing the modification and integration to the "International Regulation concerning the transport of dangerous goods by rail".

Transport of radioactive materials by sea is regulated by the DPR no. 1008 of 9 May 1968 concerning the "Regulation for the loading, transport by sea, unloading and transshipment of packages of dangerous goods" and by the Ministerial Decree of 6 April 1995 that allowed for the adoption of some of the provision laid down by the International Maritime Organisation (IMO).

The air transport of radioactive materials is regulated by the Circular no. 334096/30 of 3 December 1992. The provisions established in the Circular are based on the "Technical instructions for the safe transport of dangerous goods by air" laid down by the International Civil Aviation Organisation" (ICAO). The provision of ICAO regulation concerning the transport of radioactive materials are based on the IAEA regulations.

#### 5.(c)1.6.7.Nuclear Third Party Liability

Act no. 1860 of 1962 on the Peaceful Uses of Nuclear Energy regulates nuclear third party liability in Italy, and implements the provisions of the Paris Convention of 1960 on Third Party Liability in the Field of Nuclear Energy and of the Brussels Supplementary Convention of 1963. Moreover, Italy is a signatory partner to the Vienna Convention on Third Party Liability. Act no. 109 of 12 February 1974 authorised ratification of both Conventions and vested the Government with the powers required to enact by Decree the provisions to implement them at national level. Consequently, a Presidential Decree of 1975 amended Section I (definitions) and Sections 15 to 24 (third party liability) of the 1962 Act to bring them into line with the abovementioned Conventions [ Presidential Decree no. 519 of 10 May 1975]. Furthermore, in 1985, Italy ratified the 1982 Protocols amending the said two international Conventions [Act no. 131 of 5 March 1985].

The 1962 Act, as amended, provides for a system of absolute and exclusive liability for the operator of a nuclear installation in the event of any nuclear damage occurring in this installation or in connection with it [Sections 15 and 18]. When the operators of several installations are held liable for the same damage, they are jointly and severally liable for compensation [Section 17]. Nuclear operators are also liable in respect of damage caused by a combination of a nuclear incident and an incident other than a nuclear one, where the nuclear damage cannot be separated with certainty from the other damage.

Under Italian law, the maximum amount of liability of the operator of a nuclear installation for damage caused by a nuclear incident is fixed at L 7 500 million [Section 19]. If the amount of damage exceeds the limit of the operator's liability, thereby necessitating intervention by the State, the total amount of compensation may not exceed L 43 750 million

A Ministerial Decree of 16 February 1976 approved a model certificate of financial security for the transport of nuclear materials, based on the model certificate recommended by the OECD Steering Committee for Nuclear Energy in accordance with the Paris Convention.

Another Ministerial Decree of 1978 approved the general conditions of third party liability insurance policies for nuclear operators and for the transport of nuclear materials [DM of 3 March 1978]. Lastly, a later Decree [DM of 20 March 1979] implemented at national level the Steering Committee Decision of 27 October 1977 excluding certain categories of nuclear substances from the scope of the above Conventions. These three Decrees were adopted in implementation of the abovementioned Presidential Decree of 1975.

The most recent development in this field are:

the ratification and implementation by Italy of the Joint Protocol relating to the application of the Vienna and Paris Conventions concerning the liability of nuclear operators [Act no. 147 of 23 April 1991].

the signature by Italy of both the Protocol to Amend the Vienna Convention on Civil Nuclear Liability for Nuclear Damage and of the Convention on Supplementary Compensation for Nuclear Damage [26 January 1998].

For further details, reference can be made also to Nuclear Legislation Third Party Liability, OECD/NEA.

### **5.(c)2.INSTITUTIONAL FRAMEWORK**

The radical changes undergone, since the late 1980s, by the Italian nuclear industry have inevitably been reflected at institutional level. The former competent authorities therefore have to be considered from a fresh angle and particular attention paid to the new bodies created. A study of the objectives and powers of these bodies highlights the issues to which today's law makers wished to give special importance.



Responsibility for the control of nuclear activities in Italy is now shared amongst several ministries and involves other bodies as well, such as the Interministerial Committee for Economic Planning (CIPE) and the National Environmental Protection Agency (ANPA). As regards the National Agency for New Technologies Energy and the Environment (ENEA) and the National Electricity Company (ENEL), see the more recent developments under the respective dedicated sections.

### **5.(c)2.1. Regulatory and Supervisory Authorities**

#### 5.(c)2.1.1. Interministerial Committee for Economic Planning (CIPE)

Act no. 933 of 11 August 1960 which originally created the CNEN, now the ENEA, set up an Interministerial Committee responsible for framing the general policy of the CNEN. A Presidential Decree of 1968 transferred its powers to the CIPE [DPR no. 626 of 30 March 1968]. The CIPE is responsible, among other things, for defining the national nuclear power programme, though some of its duties are for the moment irrelevant due to the moratorium on the Italian nuclear programme. This applies in particular to the CIPE's approval of the multi-annual nuclear power plant construction programme and to its approval with regard to the more suitable sites for such plants.

The CIPE has extensive powers vis-a-vis the ENEA. Section 1 of Act no. 282 of 25 August 1991 expressly provides that the ENEA shall follow the guidelines laid down by the CIPE. In addition, after being submitted to the Ministry of Industry, Commerce and Crafts and examined by an Interministerial Committee, the ENEA's three-year programme of work has to be approved formally by the CIPE. Lastly, Section 16 of the Act provides that the ENEA Board of Governors may be asked to resign in the event of repeated non-compliance with CIPE directives.

The Committee also has decisive powers concerning the effective implementation of the National Energy Plan. Act no. 10 of 9 January 1991, which establishes the standards for the rational use of energy and for the development of renewable energy sources, provides that the CIPE shall adopt, at least once every three years, a series of guidelines on various subjects. The purpose is to co-ordinate the activities of the different public bodies involved, to promote the research and development of technology in the fields of the production, recycling and use of renewable energy sources and to promote programmes to reduce energy consumption.

The CIPE meets under the chairmanship of the Prime Minister, and includes the Minister for the Budget and Economic Planning who is the Vice-Chairman, and the Ministers for Industry, Commerce and Crafts, Foreign Affairs, the Treasury, Finance, Public Works, Labour and Social Security, Transport and Navigation. Other Ministers may be called upon to take part in meetings of the Committee.

#### 5.(c)2.1.2. Prime Minister

Under the new Decree no. 230 of 1995 on radiation protection, the Prime Minister is empowered to adopt fundamental decrees such as those laying down the application thresholds of Decree no. 230, the dose limits for workers and the public and the reference dose levels for nuclear emergencies.

#### 5.(c)2.1.3. Ministry for Industry, Commerce and Crafts

Act no. 1860 of 1962 on the Peaceful Uses of Nuclear Energy vests the Minister for Industry, Commerce and Crafts with the necessary powers to make regulations and issue the licences required in the nuclear field. The Minister is therefore the competent authority, in conjunction

with the CIPE and other Ministries, for matters relating to nuclear power plants [Chapter II of Act no. 1860 of 1962]. In addition, he authorises by Decree the operation of installations for the production and use of nuclear energy for industrial purposes, as well as of plants for the processing and use of ores, source materials, special fissile materials, enriched uranium and radioactive materials [Section 6 of Act no. 1962 and Act no. 1240 of 1971, as amended by Act no.84 of 1982 and Act no.282 of 25 August 1991].

In implementation of the legislative Decree of 1995 [Sections 15, 32, 34, 35, 36 and 55], the Minister for Industry, in agreement with the other Ministers concerned (Interior, Labour, Health and Environment) issues Decrees laying down the levels of radioactivity and other conditions pursuant to which a license is required for different activities involving ionising radiation (including the mining industry, commercial operations and utilisation for industrial and research purposes). as well as the procedures for seeking a licence. The same Minister authorises the abovementioned activities, as well as the transfer of radioactive substances within the European Union. the operation of radioactive waste disposal sites, etc..

The Minister for Industry, Commerce and Crafts may also determine the amount and terms of the financial security covering the third party liability of the operator of a nuclear installation and he approves by Decree the general conditions of the insurance policy or other form of financial security, this in agreement with the Treasury Minister after consulting the Attorney General [Sections 19, 21 and 22 of the 1962 Act as amended by DPR no. 519 of 10 May 1975].

#### 5.(c)2.1.4.Ministry for Labour

The Minister for Labour is generally responsible for the radiation protection of workers engaged in nuclear activities [Section 59 of the Legislative Decree no. 230]. In agreement with the other Ministers concerned, he issues regulations in connection with radiation protection and his responsibility in this field is discharged through the Labour Inspectorate.

#### 5.(c)2.1.5.Ministry for Health

Responsibility for protecting public health against the hazards of ionising radiation lies with the Ministry of Health acting through the support of ANPA and of the National Health Service whose aim is to prevent, by inspections or otherwise, the possibility of radiation contamination of the population or of any part of the natural environment, foodstuffs and beverages as specified under the section 97 of the Legislative Decree no. 230.

The Minister for Health, on his own or by decree jointly made with the other concerned Ministers, laid down a series of radiation protection standards (Sections 1, 11, 27, 30, 32, 55, 78, 82, 96, 98, 101, 110 and 114 of DPR no. 185).

These provisions concern, inter alia:

- the radioactivity and exposure levels below which certain activities are exempt from notification and licensing obligations;
- the details of training of personnel in radiology and nuclear medicine, the authorised criteria for radiological equipment, the specifications relating to patients' radiology records, etc.;
- the maximum permissible doses and concentrations for workers and the public;
- the abnormal levels of contamination in the environment or in foodstuffs such as to require measures to reduce such contamination;
- the procedures for classifying transit areas and workers for the purposes of physical control;

- the details of qualification requirements for experts;
- the methods and limits applicable to radioactive waste disposal in the environment.

The Italian National Institute of Health (ISS) and the National Institute for Labour Protection and Safety, as support organisations of the Ministry for Health, are consulted with regard to a number of decrees implementing Decree no. 230 (dose limits, reference dose levels for emergencies, official approval of certain sources, etc.).

A standing Commission has been created in the Ministry for Health, the essential task of which is to prepare information for the public in the event of a nuclear emergency.

#### 5.(c)2.1.6. Ministry for the Environment

Act no. 349 of 8 July 1986 set up the Ministry of the Environment which has thereafter been involved in decision-making in collaboration with the other competent Ministries. Although the Minister is not given any expressly nuclear functions in the Act of 1986. Section 2 provides, in general fashion, that the Minister for the Environment performs his functions with a view to ensuring protection of the soil, air and water. Moreover, paragraph 14 of Section 2 provides that the Minister, in agreement with the Minister for Health, proposes to the President of the Council the maximum concentration limits and maximum exposure doses with respect to chemical, physical or biological contamination. As far as defining exposure ceilings for workers is concerned, the Minister for Labour and Social Security must give his opinion before the proposal is submitted to the Prime Minister. In addition, whenever construction of an installation capable of having an impact on the surrounding environment is being planned, the Minister for the Environment is responsible of the compatibility of the project with environmental protection requirements.

Lastly, it should be noted that this new Ministry, created in 1986, has taken over some of the powers of the Minister for Health, for example, the monitoring of environmental radioactivity, as provided for in Section 104 of Decree no. 230 of 1995.

Although this task continues to be performed at local level, the Minister for the Environment has an overall power of surveillance and may take over these tasks should the regional bodies fail to carry them out properly. Section 9 of the 1986 Act extends this power of surveillance to all the other functions delegated to local authorities in the field of environment, and authorises the Ministry to intervene directly should the regional authorities persist in failing to take action. Section 115 of Decree no. 230 also makes provision for the Minister for the Environment to be involved in the establishment of reference dose levels for the planning of radiation emergencies. The Minister is also involved in the preparation of numerous implementation decrees of Decree no. 230.

#### 5.(c)2.1.7. Ministry for the Interior

In accordance with Decree no. 230 of 1995, the Minister for the Interior, who is generally responsible for public safety, takes part in the making of regulations by other Ministers in connection with the classification and licensing of commercial activities involving the use of nuclear and radioactive materials.

The same Decree provides that each nuclear installation must be provided with an external emergency plan to ensure protection of the public against the harmful effects of a nuclear accident. Such plans consist of a series of co-ordinated measures to be taken by those responsible in case of an incident at a nuclear installation which might affect public safety. The Minister for the Interior contributes to the formulation of the national radiological emergency plan (Section 125 of Decree no. 230), in conjunction with the Department of Civil Protection

As the authority associated with the Minister for the Interior in each region, the Prefect is competent to grant a clearance certificate for category B use of radioactive substances and appliances containing them, in industry and research. The Prefect is also responsible for preparing the emergency plan in the region and for its application as part of the national emergency plan.

#### 5.(c)2.1.8.Department of Civil Protection

This Department, which comes under the authority of the Prime Minister is charged, under Decree no. 230/95, with a number of regulatory and administrative actions in the fields of protecting the public and radiation emergencies, in conjunction with other competent ministries. Additional references to the key duties of the quoted Department, in particular in the field of the Emergency Preparedness, are given under the section 2.(c)7. Art. 16 of the Report.

#### 5.(c)2.1.9.Ministry for Transport and Navigation

This Ministry, created by Act no. 537 of 24 December 1993, represents a merger of two previous Ministries: the Ministry of Transport and the Ministry of the Merchant Navy. The duties carried out by these two Ministries have been temporarily transferred to the Ministry of Transport and Navigation. Thus, this latter Minister is, for the moment, the competent authority, in conjunction with the Minister for Industry, Commerce and Crafts, for granting licences for the transport of nuclear and radioactive materials by road, rail, air and sea [Section 5 of Act no. 1860 of 31 December 1962, as amended by DPR no. 1704 of 30 December 1965].

#### 5.(c)2.1.10.Ministry for Foreign Trade

The import of ores, source materials and radioactive materials is subject to authorisation by the Minister for Foreign Trade when such authorisations are required by financial and currency regulations. Together with the Finance Minister, the Minister for Foreign Trade has laid down the rules for importing goods, establishing in particular which goods require an import licence, including radioisotopes and radiation emitting equipment [Section 4 of Act no. 1860 of 1962 and DM of 30 October 1990 promulgating the list of goods requiring an import licence].

#### 5.(c)2.1.11.Ministry for Education

Public institutions possessing radioactive materials for teaching or scientific research are required to report them to the Minister when the materials are in excess of the prescribed quantities [Section 3 of Act no. 1860 of 1962, as amended by Section I of DPR no. 1704].

The Minister is also involved in licensing the use of radioisotopes above certain quantities [Section 13, as amended by Section 3 of DPR no. 1704].

#### 5.(c)2.1.12.Treasury Ministry

The Treasury Minister has to approve the general conditions of the financial security for the liability of nuclear operators when such security is not in the form of an insurance policy. Furthermore, notice of summons in respect of actions for compensation of nuclear damage are submitted to the Minister who may, in all cases, intervene in the proceedings [Sections 22 and 25 of Act no. 1860 of 1962, as amended by Section 2 of the DPR of 10 May 1975].

The Minister is also consulted by the Minister for Industry, Commerce and Crafts on the estimates of the ANPA's expenditure [Section 5 of Act no. 282 of 25 August 1991].

#### 5.(c)2.1.13.Ministry for Universities and for Scientific and Technical Research

The above Minister is responsible for co-ordinating at national and international level all measures to promote the development of scientific and technical research and is consulted by the Minister for Industry, Commerce and Crafts in connection with the ENEA's research and development programmes and its scientific, technical and industrial co-operation with international or foreign organisations [Sections 1 and 2 of Act no. 282 of 25 August 1991]. The Minister for Universities is also involved in determining the radiation protection qualifications of personnel in radiology and nuclear medicine [Section 110 of Decree no 230 of 1995].

#### 5.(c)2.1.14.Ministry for Foreign Affairs

The above Minister is also consulted by the Minister for Industry, Commerce and Crafts in connection with the activities of the ANPA in the field of international co-operation [Section 2 of Act no. 282 of 25 August 1991].

#### 5.(c)2.1.15.State Advocate General

Presidential Decree no. 519 of 10 May 1975 provides that the opinion of the State Advocate General must be obtained before final approval may be given to the general conditions for insurance or other form of financial security decided on by the Minister for Industry, Commerce and Crafts in agreement with the Treasury Minister .

### 5.(c)2.2.Advisory Bodies

#### 5.(c)2.2.1.Interministerial Council for Consultation and Co-ordination

This Interministerial Council was set up under the Ministry of Industry, Commerce and Crafts pursuant to Presidential Decree no. 185 of 1964 on radiation protection and was confirmed by Decree no. 230. Section 8. It meets under the chairmanship of the Director General for Energy Sources and Basic Industries and is composed of nine representatives of the ministries concerned and one representative of the ANPA. All members are appointed for four years by Decree of the Prime Minister, on the proposal of the Minister for Industry. The Council is responsible for co-ordinating, from the administrative point of view, the activities of the different government departments responsible for the application of Decree no. 230, by reviewing all the provisions concerning the peaceful uses of nuclear energy.

#### 5.(c)2.2.2.Co-ordinating Committee for Radiation Protection of Workers and the Public

This Committee was set up by Presidential Decree no. 619 of 1980, and includes the organisations mentioned in the penultimate paragraph of the Section dealing with the Health Ministry above, as well as the National Research Council and the ANPA. The Committee is consulted by the Ministers for Health and the Environment on topics that fall within their competence.

#### 5.(c)2.2.3.Regional and Provincial Commissions for Public Health Protection Against the Hazards of Ionising Radiation

By Decree no. 185 of 1964, a Commission was set up in each region under the chairmanship of the Regional Director of Public Health to give its advice on questions relating to public health protection against the hazards of ionising radiation. The Commissions are involved in the licensing procedures for the possession and use of radioactive sources and for radioactive waste disposal in connection with scientific, industrial and medical activities.

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Decree no. 230/95 now provides for such technical advisory bodies to be established at regional and provincial levels under legislation adopted at those levels.

5.(c)2.2.4. Technical Commission for Nuclear Safety and Health  
Protection

This Commission was also set up by Decree no. 185 of 1964 and was confirmed by Decree no. 230 [Section 9]. It consists of sixteen experts. Members of this Commission are appointed by the Ministries of Environment, Industry, Employment, Health, Interior, Public Works, ENEA and ANPA, in whose offices it convenes and finds administrative support. When necessary other specialists are appointed by the Chairman of the Commission. For matters under the competence of other Public Scientific Organisations and Administrations (e.g. Italian National Institute of Health, National Research Council), in compliance with Section 9 of the Legislative Decree 230/1995, those Organisation and Administrations are invited to sit in the Commission through a designated representative.

The Chairman is appointed from these experts by decree of the Prime Minister. The Commission gives its advice on questions relating to the licensing of nuclear installations and radiation emergencies as provided for in Decree no. 230, as well as at the request of the government.

### **5.(c)2.3.Public and semi-public Agencies**

#### 5.(c)2.3.1.National Environmental Protection Agency (ANPA)

In January 1994, the Italian Parliament approved Decree no. 496 of 4 December 1993 providing for the creation of the National Environmental Protection Agency (ANPA). This Decree became Act no. 61 of 21 January 1994.

The decision to create this Agency was a result of the referendum of 18 April 1993 which repealed the provisions giving Local Health Units responsibility for monitoring the environment. Thus, the Act no. 61 introduced a distinction between bodies responsible for health questions and those responsible for environmental control.

The National Environmental Protection Agency comes directly under the Minister for the Environment and is subject to controls by the Board of Auditors. Its powers, listed in Section 10 (1) of Act no. 61, relate to a series of technical and scientific activities of national interest. Its main role is to carry out public duties, such as providing technical and scientific backup to the Ministry of the Environment and associated bodies with a view to protecting the environment, the collection and periodic dissemination of data on the state of the environment, the formulation of proposals and opinions for both central Government and local authorities concerning quality standards for air, water, soil, etc. Nuclear activities are expressly referred to under the letter "l" of the same Section which requires the Agency to exercise control over activities relating to the peaceful uses of nuclear energy and over the effects of ionising radiation on the environment. The Agency's functions are essentially radiation protection inspection, as well as formulating advice as to the legal, regulatory and administrative provisions affecting radiation protection of workers and the public.

Under Section 1(5) of the Act, the ANPA replaces the Nuclear Safety and Health Protection Directorate of the ENEA (ENEA-DISP), whose functions, staff, technical structures and equipment and financial resources are transferred to the new Agency

#### 5.(c)2.3.2.National Electricity Company (ENEL, s.p.a.)

Act no. 1643 of 6 December 1962 nationalising the electricity industry in Italy set up a body governed by public law and possessing legal personality: the National Electricity Company (ENEL), responsible for all activities relating to the production, import, export, conversion, distribution and sale of electrical power. The ENEL accordingly managed and operated nuclear power plants in Italy and was also responsible for the power plant building programme. The ENEL therefore held a monopoly of national electricity [Act no. 1643 of 6 December 1962].

Important changes occurred in Italy in the energy field during the 1990s. In the first place, Acts no. 9 and 10 of 9 January 1991 significantly reduced ENEL's monopoly to leave more room for independent producers and local businesses. Then, the ENEL was transformed into a limited company (ENEL s.p.a.) which makes it possible for private individuals to take out shares in the company [Act no. 359 of 8 August 1992].

#### 5.(c)2.3.3.National Agency for New Technologies, Energy and the Environment (ENEA)

Three important changes have been made within this body since 1960, the year in which the National Committee for Nuclear Energy (CNEN) was set up [Act no. 933 of 1 August 1960], and 1991, the year of the latest reorganisation.

The first change, in 1971, gave the CNEN new powers, and in particular the task of undertaking, in collaboration with specialised companies, the construction of experimental facilities and the development of prototype reactors [Act no. 1240 of 15 December 1971]. The second change dates from 1982 when Act no. 84 of 5 March 1982 renamed and reorganised the CNEN. The acronym ENEA, standing for the National Committee for Research and Development of Nuclear and Alternative Energies, replaced the CNEN whose former duties were extended to include research into, and development of alternative energies. The ENEA, however, continued to perform the CNEN's statutory tasks, in particular, ensuring that nuclear energy and ionising radiation are used without causing any hazard. Under the latest reorganisation, dating from 1991, significant changes were made to ENEA's duties [Act no. 282 of 25 August 1991]. While retaining its acronym, ENEA is now called the National Agency for New Technologies, Energy and the Environment. ENEA retains its technical and scientific responsibilities (special studies, research, experimental work, etc.) regarding nuclear activities, notably in the field of research on nuclear safety and radiation protection, while broadening its jurisdiction to include questions relating to the environment and to new technologies.

#### 5.(c)2.3.3.1.Legal status

The ENEA is a body governed by public law which carries on its activities in accordance with the directives of the Interministerial Committee for Economic Planning (CIPE). It is placed under the authority of the Minister for Industry, Commerce and Crafts, and consults the Minister for Universities and for Scientific and Technological Research as regards R&D programmes, and the Minister for the Environment in relation to projects which could affect the natural environment [Act no. 282 Section 1].

#### 5.(c)2.3.3.2.Responsibilities

As regards new technologies, energy and the environment, ENEA's duties are]:

- to carry out and promote studies, research and development of innovative leading-edge technologies;
- to carry out, promote and co-ordinate studies, research and experiments on the effects, including the economic and social consequences, of the development and use of technologies, and on the safety of nuclear installations and protection against ionising radiation;
- to cooperate in the scientific, technical and industrial fields, with the international bodies involved in the same sectors;
- to formulate and implement plans for the dissemination of know-how and research results to Government departments;
- to train staff in technological subjects and disseminate the knowledge acquired; to give opinions to, and carry out technical controls on behalf of Government, regional and local authorities;
- to work with Ministries of Industry, Environment, University and Research, Agriculture and Cultural Resources on designing and conducting projects involving the European Union and other International Organisations such as United Nations and the OECD.

The control of nuclear safety, radiation protection, physical protection, etc. are the responsibility of the ANPA according to the Act (no. 61 of 1994) establishing that Agency.

#### 5.(c)2.3.4.Italian National Institute of Health (ISS)



The roles and responsibilities of the Italian National Institute of Health are the following:

- Provides consultancy for public health in the area of ionising radiations (in particular in energy production and medical activities), according to the Legislative Decree 267/1993;
- expresses advices in the set up of Governmental or Ministerial Decrees related to the application of the Legislative Decree 230/1995 (art. 1);
- nominates, for aspects of its own responsibility, an expert for sitting in the Technical Commission, according to the Legislative Decree 230/1995 (art. 9);
- provides advices on the criteria to be applied for qualification of approved type sources, according to the Legislative Decree 230/1995 (art. 26);
- provides *de facto* technical advices to the Public Health Ministry during licensing of Nuclear Installations, including decommissioning;
- provides advices on exposure limits for workers and members of the public, according to the Legislative Decree 230/1995 (art. 96);
- co-operates with ANPA to the assessment of dose to the public, according to the Legislative Decree 230/1995 (art. 106);
- provides advices to the Public Health Ministry on radiological apparatus for medical applications, according to the Legislative Decree 230/1995 (art. 112);
- provides advices to the Public Health Ministry on the recording of medical treatments,, according to the Legislative Decree 230/1995 (art. 114);
- provides advices on reference values for nuclear emergency plans, according to the Legislative Decree 230/1995 (art. 115);
- takes part in the CEVaD, according to the Legislative Decree 230/1995 (art. 123);
- takes part in the permanent Commission for information about health protection against risks from ionising radiation, according to the Legislative Decree 230/1995 (art. 133);
- takes part in the Co-ordination Committee on interventions for radiological protection of workers and public, according to the Presidential Decree 619/1980 (art. 21);
- takes part in the Nuclear Section of the National Commission for prediction and prevention of major hazards, according to the Law 225/1992;

Moreover, the National Institute of Health carries out basic and application-oriented research on the interaction mechanisms between radiation and biological systems, on the distribution and diffusion of radionuclides in the environment, also in accident conditions, on the development of dosimetry techniques in various fields, on quality and optimisation related to medical diagnostics and treatment with ionising radiations.

#### 5.(c)2.3.5.National Health Service

Act No. 833 of 23 December 1978 set up a National Health Service with responsibilities in the field of radiation protection. The Act determines and allocates between the State, the Regions and local authorities, the various duties, structures and services aimed at promoting, maintaining and restoring the health of workers and the population.

The State maintains its powers concerning the health control of the production and use of nuclear energy and radioactive materials, while certain administrative functions are delegated to the Regions concerning control, trade in and storage of radioactive materials.

Under the 1978 Act, the Provincial Director of Public Health is no longer answerable to the Ministry of Health but to the regional authorities. The Legislative Decree No. 230 / 1995 entrusted various functions to the National Health Service, as well as to its regional structures.

#### **5.(d) Content of the Application Document for the Detailed Designs Approval**

Content of the application document for the detailed designs approval:

##### 1. System requirements

- Purpose of the system and its physical and functional arrangement in the plant with details of the main physical and functional interfaces
- Design basis elements and data such as:
  - plant conditions under which the system is required to function,
  - conditions due to accident and/or external events under which the system must continue to function,
  - minimum performance requirements for the various modes of operation,
  - reliability targets,
  - accessibility,
  - safety system requirements, etc

##### 2. System description and drawings

- identification of the components, including instrumentation and their functional arrangements
- physical arrangement
- applicable rules, standards and guides
- operating modes
- components requirements
- design data for the components essential to the functioning of the system
- design methods description for the components
- data and requirements for the protection and monitoring circuits of the system
- identification of support systems
- components accessibility requirements
- indication of the methods of removal and transport for the replacement of the components
- process diagrams (PDs)
- process and instrumentation diagrams (P&IDs)
- functional and control diagrams (FCDs)

##### 3. Quality assurance

- planning of the quality assurance actions that the applicant and the principal supplier of the system intend to implement

##### 4. System design compliance demonstration with :

- safety criteria
- technical requirements attached to the plant construction permit
- post-TMI requirements
- structural feasibility
- radiation protection criteria
- etc

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**5.(e) Application Documents for Approval of Nuclear Test Programme and Granting Operating License****5.(e)1. Type of documents**

According to the Italian law regulating the peaceful use of nuclear energy the following documents have to be presented by the Applicant to apply for approval of the nuclear test programme. They obviously are in addition to the general nuclear tests programme and to the document reporting the results of the preoperational tests .

- Final Safety Analysis report
- Organisational structure of the operating organisation
- Operation manual
- Proposal of Technical specifications
- QA program
- Emergency planning

**5.(e)2. Documents standard content****5.(e)2.1.Final Safety Analysis Report**

One important aspect to be defined with this respect is the level of prescription that the guide should have, in particular with reference to the “ safety analysis report ”. More specifically two alternatives are possible:

- the guide should indicate the minimum type and level of information to be provided (e.g. indication of main areas and topics for each area without prescribing any index of content)
- the guide should prescribe an index and indicate, in detail, the content of each paragraph of the reports (e.g. as in the case of USNRC RG 1.70)

In the following, a preliminary indication of the areas expected to be covered in the safety analysis report are reported. It is important to underline that, as basis for the decision making process of licensing , the content of the report should reflect the need to show the safety level of the plant on the basis of an analysis comparable to that commonly performed for western NPPs.

**1. Description of the site**

This description should cover all those characteristics of the site that can affect:

- external events having impact on the plant design
  - radiological consequences on the environment and population as result of radioactive releases in normal and accident conditions
2. General description of the plant with a synthetic description of the main systems and a general lay-out of the plant buildings. These description correctly reflect the actual status of the plant.
  3. Comparison tables with similar plants comparing most relevant characteristics and design parameters.
  4. Regulations, standards & general design criteria and compliance demonstration (consistency with western standards applicable to plant of the same generation will have to be shown)
  5. Plant systems description and analysis (objectives, design criteria and compliance demonstration. Non compliance will have to be identified and evaluated)

6. Accident analysis (identification and discussion of acceptance criteria, analysis methodology, reference accidents and radiological consequences - Non compliance will have to be identified and evaluated)

### **5.(e)2.2.Organisational structure of the operating organisation**

The licensee should provide information on the organisational structure of the operating organisation. In such a document the following aspects should be extensively discussed both for normal and emergency situations:

- Organisational structure of the operating organisation/plant in which the following functions are clearly represented:

a) Policy making function: (e.g. Plant management head)

b) Operating functions: (Operation head, shift supervisor, control room operators)

c) Supporting functions: Maintenance and repair, Technical services (Reactor Physics, Chemistry, Planning and scheduling, Spent fuel storage, Training , Fire fighting, In service inspection etc.)

d) Reviewing functions: Health physics, QA, Medical supervision and investigation, safety analysis

- duties, responsibilities, authority, minimum number of personnel for each position indicated in the organisational flow chart. Transfer of responsibilities in case of any impediment of individuals covering key positions

- safety committees having advisory duties on safety related matters associated to:

\* plant hardware modifications

\* operating procedures modifications

\* special tests or operation

\* periodic review of plant safety performance

\* positions for which a specific license is requested

\* positions for which a license is not requested. For these positions minimum qualification requirements have to be established

\* connections among positions covered in normal and accidental conditions

The above functions, depending on the feasibility could be covered either at the plant or in central office of the operating organisation.

### **5.(e)2.3.Plant operating manual**

The licensee has to present the plant operating manual containing all the procedures and instructions to be followed during plant normal and emergency operation, maintenance, testing etc. both at plant and system level.

It should include the following :

- Plant, systems and components description
- Administrative procedures
- Procedures for normal plant operation
- Surveillance rules and procedures
- Maintenance procedures
- Reactor physics procedures
- Chemistry procedures
- Health physics procedures
- Emergency procedures

#### Plant, systems and components description

It contains general and detailed descriptions of systems and components and describes how they operate in normal, abnormal and emergency conditions. (including PD, P&ID, FCD and elementary diagrams)

#### Administrative procedures

They attain administrative aspects such as: definition of activities and responsibilities related to job permits, how to fill up operating records, filing of documentation

#### Procedures for normal operation

They describe how to operating the plant and each system within specified operational limits and conditions including start up, power levels, shutdown and refuelling.

The plant procedures relate to more systems as in case of start up and shutdown etc. The systems procedures provide instructions for alignment in different plant conditions.

#### Surveillance rules and procedures

Surveillance rules establish the type of surveillance and its frequency to demonstrate systems operability and the compliance with tech. Spec. values of critical parameters.

Surveillance procedures define how to perform the surveillance activity as prescribed in the surveillance rules.

#### Maintenance procedures

They establish how to perform normal or extraordinary maintenance activity on equipment and components

#### Reactor physics procedures

They establish how to perform activities related to fuel and core management

#### Chemistry procedures

They establish the analysis methodology used to determine chemical and radiochemical parameters of the plant (e.g. how to maintain coolant quality)

#### Health physics procedures

They regulate how to implement to personnel radiation protection program (e.g. regulation of access and work performance in controlled zones)

#### Emergency procedures

They describe all the actions of the operator to monitor and to mitigate the evolution of abnormal and accident conditions

### **5.(e)2.4. Technical Specifications**

They should be presented by the licensee as part of the application documents. They represent the proposed operational limits for the safe operation of the NPP. Their purpose is to require that the overall facility status is consistent with the assumptions in the safety analysis. (e.g. Physical characteristics of the facility, Status of equipment, Operating state of equipment, Values of process parameters, Condition of equipment structures). They have to include mainly the following categories of prescriptions:

- Safety limits (to provide assurance that the barrier integrity is preserved - e.g. thermal power, RCS pressure, primary circuit water level etc.)
- Limiting safety systems setting (conservative actuation limits for safety related protection devices - SCRAM system)
- Limiting Conditions for Operation (LCO - lowest functional capabilities and performance level of equipment, the limiting values of process parameters, and the conservative actuation limits for specified automatic protective devices required for operation consistent with safety analysis, or with an acceptable level of safety. Included in the LCO shall be the remedial actions to be taken if:

- 
- the operable status is less than the minimum required
  - the monitored parameters are not in the specified range
  - the instrument set points are less than specified values
  - Surveillance requirements (tests, calibration, monitoring or inspections to ensure quality and operational status of systems and components or to ensure that parameters and set points are periodically verified to be within LCOs).
  - Design features (relevant physical characteristics of a facility (e.g. exclusion area, containment design temperature and pressure, fuel assemblies etc.)
  - Administrative Controls (relating to organisation and management, procedure, records keeping, review and audit and reporting necessary to ensure safe operation of the facility)
- A specific document has to be issued together with the technical specifications in which all the bases of the requirements are specified.
- Technical specifications should be written in a clear and concise manner with the intent to ensure uniform interpretation by all operators and auditors.

#### **5.(e)2.5.QA program**

The Applicant has to present a document (or a number of different documents) pertaining the quality assurance program for plant operation. The QA program should describe all the measures to be implemented to ensure the requested level of quality in all safety related activities such as operation, maintenance, fuel management, radiation protection, inspection & testing, modifications, personnel recruitment and training, procurement etc. The program should discuss the coverage in the plant organisation of QA arrangements, the requested procedures & instructions with respect to their preparation, review, approval and verification, the documentation control and the type of independent assessment and review to be implemented.

#### **5.(e)2.6.Emergency plan**

The Applicant shall be requested to present an On site Emergency Plan covering a definition of the criteria of emergency declaration and notification, description of the on-site organisation for emergencies, emergency facilities, emergency measures to be undertaken and related procedures, arrangements to provide aid to affected personnel, training of personnel etc.

In parallel with the on-site emergency plan an Overall emergency plan should be available.

This plan should discuss the co-ordination of operating organisation efforts with those made available by involved public authorities in case of accident involving radioactive releases beyond the site boundary.

#### **5.(f) *Index of General Criteria and Requirements document developed for PUN design***

- Objectives and fields of application
- Definitions
- Safety Objectives
- Protection of General Public
- Protection of Workers
- Exposures optimisation

- 
- External and area events
  - Natural external events
  - Man-made events
  - Flooding events
  - Dynamic effects
  - Fire
  - Physical and functional integrity of barriers
  - Fuel
  - Reactor Coolant Pressure boundary
  - Containment
  - Probabilistic Safety Objectives
  - Plant Systems Design requirements
  - Transient and accident analysis
  - Human factors
  - Provisions for decommissioning

**5.(g) Probabilistic Safety Objectives for the PUN Design**

- The annual frequency of all accidental sequences capable of causing severe damage to the core should be in the interval comprised between  $10^{-5}$  -  $10^{-6}$  and each sequence should not significantly contribute to the overall probability of fuel damage.
- In case of core damage the conditional probability of causing a release of iodine beyond 0.1 % of core inventory should be less than 5%.

PLANT CONDITIONS	ANNUAL PROBABILITY	DESIGN OBJECTIVES FOR RADIO LOGICAL CONSEQUENCES EDE (Effective Dose Equivalent) IODE (Individual Organ Dose Equivalent)
Normal operation		EDE 0,1 mSv IODE 0,3 mSv
Abnormal Operating Transients of Moderate Frequency	$P \geq 3 \times 10^{-2}$	as above
Infrequent Abnormal Operating Transients	$3 \times 10^{-2} > P \geq 10^{-3}$	EDE 5mSv (per event) IODE 15 mSv per event
Very low frequency DBA	$P < 10^{-3}$	EDE 100 mSv (with a target of 5 mSv) IODE 150 mSv



### **5.(h) CAORSO NPP: FUNDAMENTAL DOCUMENTS FOR OPERATION.**

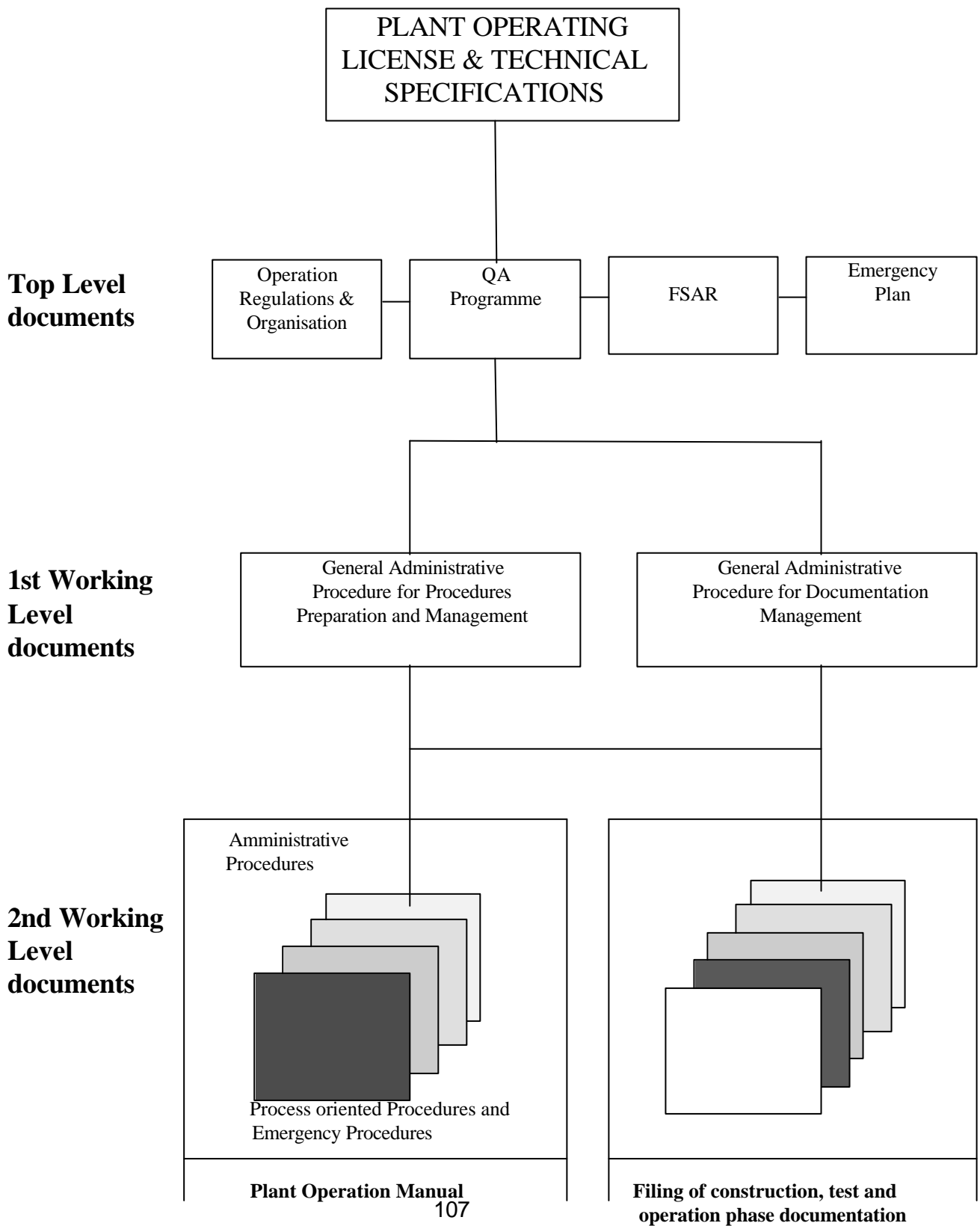
The Caorso NPP document structure main lines are presented in figure 1 hereinbelow.

- Top level documents are managed, prepared approved and issued in accordance with requirements established directly in the relevant Italian laws.
- The arguments treated in the QA Programme enforced by ENEL for the Caorso NPP operation are summarised in appendix 1. In the Q.A. Programme are included the Q.A. requirements related to the safety relevant documentation and the-guide lines for their implementation.
- The first working level General administrative Procedures (two sets)-establish the specific management guides for each type of documentation. One is dedicated to the Procedures, the other to the entire Plant documentation organisation, management and filing  
The content of these two General Procedures is summarised in appendix 2
- The guidelines and requirements of the first working level procedures are more specifically taken into account in the second working level procedures which form the Operation Manual. These procedures are tailored to the specific activity addressed and include administrative, process (or work) oriented procedures and emergency procedures. Among these procedures the administrative type has a fundamental impact on Plant configuration management and related documentation. Particular importance, in this field, is assumed by the following administrative procedures:
  - Work- Orders management
  - Plant Modifications
  - Temporary modifications
  - FSAR Content and up-dating

In appendix 1 is also presented a partial list of significant administrative procedures included in the Operation Manual

**CAORSO NPP DOCUMENTATION**

**Figure 5(h)1**



## Appendix 1

### CAORSO NPP: QUALITY ASSURANCE PLAN - LIST OF CONTENTS

1	Introduction
2	Organization
3	Safety Review Board
4	Auditing
5	Corrective Actions
6	Plant Changes
7	Procurement
8	Personnel Recruitment, Qualification And Training
9	Plant Items Identification System
10	Plant Information System
11	Plant Operation
12	Plant Maintenance
13	Surveillance Tests
14	Measuring And Test Equipments
15	Handling And Storage
16	Special Tests
17	Worker And Environmental Radiation Protection
18	Emergency Conditions
19	Reports To Regulatory Agency
20	Document Control

### CAORSO NPP: ADMINISTRATIVE PROCEDURE LIST (PARTIAL)

101	Safety Review Board Activities
103	Departments Chiefs, Periodic Meetings
116	Plant Changes
114	Special Test
116	Work Permit
118	Shift Over, Exchange Of Duties
119	Temporary Modifications
120	Operation Log Book
121	Measuring And Test Equipments
122	Event Reporting System
126	Document Management And Control System
130	Procurement
134	Receiving Inspections and Non Conformities
<b>144</b>	<b>Management Of Operation Manual Procedures</b>
145	Personnel Training
1001	Internal Auditing
1002	Corrective Actions

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## Appendix 2

### 1. General Procedure - "Procedure Preparation and Management"

#### Summary of the content:

Establishes for each type of Procedure, forming the Plant Operation Manual, the format, the content and the responsibilities for its preparation, review, approval and distribution. It contains also requirements for other working level documents ( Technical Notes, Instructions, Procurement specifications, etc.)

The types of procedures forming the Sections of the Operation Manual are:

- Administrative
- General
- Maintenance
- Abnormal and Emergency
- Surveillance tests
- Radiation Protection
- Chemical and radiochemical
- Environmental surveillance
- Quality assurance
- Special Process
- Special tests and experiences

In the 'Surveillance tests' Section of the Operation Manual are contained also the 'Surveillance Requirements', approved by the Regulatory Agency, related to the Technical Specification.

### 2 General Procedure "Documentation Management"

Establishes for the various types of documentation, filed (or to be filed) In the Plant Archive, the identification system, based mainly on the construction classification system, the physical position and the period of conservation. Furthermore establishes the measure related to the protection (fire, flooding, accessibility,;) of Archive and documents, and the responsibilities for the documentation control and management related to distribution, up-dating, revision and allocation.

The type of document addressed are:

- Licensing
- Engineering
- Construction (as built drawings, specifications, Vendor manuals)
- Start-up tests and records
- ISI (pre-service and in-service inspections)
- Quality certification of systems, structures and components (installed and stored)
- Operation (work orders, surveillance tests and inspection reports, Recorder charts)
- Radiation Protection
- Quality Assurance

### **5.(i) PASSAGE OF THE PLANT TO LAY-UP CONDITION**

Following the Year 1987 Government decision to suspend NPPs operation, Caorso Plant entered a "not determined" period of operation in "Cold-Shut down Condition" with the Core loaded. Lay-up activities of systems and components were started; they can be grouped in two Phases.

#### **Lay-up Phase I:**

From early 1987 to early 1988, with the goal of maintaining full operability of the Plant in order to have the capability of a short-time restart in case of authorisation release. In this period all Plant activities were performed in accordance with the existing OM procedures and the Surveillance requirements of all systems/components and parameters were satisfied.

In the second half of this Phase a "Lay-up Working Group" (L.W.G.) was created within the Plant Organisation to study and produce a "medium-to-long term" Lay-up Plan.

The phase I of Lay-up ended in early 1988 when an extensive maintenance and testing program was performed to demonstrate Plant capability to a safe restart

In this period also an extensive Probabilistic Risk Assessment (PRA) study was performed demonstrating

#### **Lay-up Phase II:**

In early 1988 was decided to implement the medium-long term Lay-up Plan of the Plant in order to:

- Assure the compliance with the Technical Specifications (TS). requirements applicable in "Cold Shut down" and related Surveillance requirements.
- maintain Operability of the systems and components related to any possible activity in Cold Shut down (like Core Alteration, irradiated fuel handling, etc.) performing on them all feasible Surveillance Procedures.
- Maintain good internal environmental condition in the systems, in order to avoid degradation (corrosions etc.), facilitate future decommissioning and reduce contamination
- Operate or exercise all components where practicable.
- Select and reduce solid waste production.
- maintain operators/worker's skill, training and "safety culture"
- Assure the readiness of the plant to resume operation, if requested.

The Plant Lay-up Plan design was completed, in mid 1988. The Lay-up guide lines stated, essentially, that:

- a) Dry Lay-up should be implemented for all systems not needed in service and where applicable
- b) Wet Lay-up should be chosen for the remaining systems with continuous or periodic "controlled chemistry" water circulation at sustained speed.
- c) Rotation/movement of all mechanical equipment and electric motors should be periodically performed (special rules for valves should be implemented).
- d) Periodical checks on I&C should be performed; heating should be maintained on electric motors and out of service instruments should be maintained according to specific instructions.

The full implementation of the Lay-up Plan was achieved at the end of year 1988. Since then, the experience gained by the control of the effectiveness of the Lay-up and the support of Constructors or external experience, has been reflected in up-dating and optimising the specific Lay-up methods mainly in view of a continuously extending period of Plant outage.

## QA Program

In order to achieve the before mentioned goals, to control the Lay-up effectiveness and gain a documented experience from this period of Plant Operation, the whole of the Lay-up activities were integrated with the ongoing activities to be performed in compliance with the Quality assurance requirements applied in operation. Therefore the QA. Program (QAP) for operation and the related implementing procedures contained in the Operation Manual (OM) were extended to include the Lay-up activities.

According to the above management decision:

- All Caorso Plant departments were directly involved, with their specific competence/ in operation, maintenance, engineering support, programming, chemical-health physics, procurement, Quality Assurance/control, etc. The L.W.G. members were high level representatives of the departments of the Plant organisation, operating under the co-ordination of the "OPERATION AREA" Superintendent.
- The Lay-up Plan and Guide lines were described in a Procedure of the Operation Manual (General procedure no 220). The Lay-up were implemented through System specific procedure covering the entire Plant, being assessed with the existing OM procedure.
- The Personnel Training-retraining Program was newly assessed and implemented.
- The Lay-up procedure were submitted to the "iter" of approval pertaining to the OM Procedures, comprehensive of the Radioactive Protection Qualified Expert and Plant Safety Board reviews, and transmittal to Regulation Authority. The content of each system Lay-up procedure was structured as follows:
  - Preliminary activities to be performed in the System to achieve the required Lay-up condition
  - Plant organisation responsible of implementing the various Procedure steps
  - Operating instructions on activities to be performed
  - Inspection/tests and related frequency
  - Activities, and time schedule, necessary to restore the system to normal operation
  - Data sheets, where all activities/results are documented.

## QA. SELECTED APPROACHES

### **Plant changes/operational changes**

The various Lay-up activities requested a certain number of plant changes and/or temporary circuit alterations.

These were approved, performed and documented according to the pertinent OM administrative procedure including the "Work permit" procedure applied for their implementation.

Changes were reflected in the pertinent drawings. In particular a special series of drawings was issued which illustrates on the "Process and instrumentation diagram" of the affected system, the dry Lay-up circuit, its boundary and modification of component alignment.

The operational changes were mainly included in the Lay-up procedures but requested also to revise other OM. existing procedures (surveillance procedures). These Procedure revisions were issued as Procedure Variant applicable only during Plant Lay-up, according to an existing administrative procedure. The original Procedures were Maintained in the OM. as reference.

### **Lay-up versus Technical Specifications. requirements assessment**

One of the problems faced during the phase of Plant Lay-up was to optimise the Lay-up of systems/components and meanwhile maintain the safety of the Plant itself: specifically to prevent violations of TS and Surveillance requirements applicable in Cold Shutdown.

Furthermore it should be taken into account that not-applicable TS in the actual condition could become applicable for possible activities (like handling of the irradiated fuel).

The approach was to review all TS./Surveillance requirements, in the various conditions of applicability, and the related Surveillance test Procedures. The review results were loaded on the Plant Computer under a matrix form.

The scope was to point out the actual requirements to comply with, the requirements that could become applicable for different foreseeable Conditions of Operation, the systems and the Surveillance Procedures involved.

According to the review results, to each Surveillance Procedure (and related systems/components) a Code (1,2 or 3) was attributed where:

- Code 1 means that the system/component or parameters has to be maintained respectively OPERABLE or controlled in the actual operating Condition. Surveillance scheduling is maintained as in normal operation on these items.
- Code 2 means that the system/component or parameter has not OPERABILITY or limiting value requirements in the actual operating condition, but it has any one of the following characteristics:
  - a) TS. on these items become applicable if allowed activities in Cold Shut down (like works that have the potential of draining the primary coolant, irradiated fuel handling, etc.) are performed or if Reactor core unloading has to be performed.
  - b) the system/component may be considered a back up to an OPERABLE system;

c) the performance of Surveillance Procedures on these items is helpful for maintaining the system/component in a good Lay-up condition and/or for maintaining personnel qualification and training.

The Surveillance Procedures coded as 2 are performed like in Normal Operation except that their frequency is established according to Lay-up criteria.

- Code 3 means that the system/component or parameter has not OPERABILITY or limiting value requirements in the actual operating condition and that code 2 conditions are not applicable. Activities on that system/component is governed solely by Lay-up procedures.

The codes 1, 2, 3 and the frequency variations were introduced in the existing automatic support for the Surveillance general Program in order to correspondingly assess the periodic Surveillance operating programs issued weekly.

### **Lay-up Plan implementation and effectiveness Control**

As previously stated the Lay-up operating Procedures point out the control responsibility of the portion of activity assigned to each Plant organisation (Department, Section) Furthermore, data sheets are reviewed by assigned people and results are reported to the L.W.G. which meets on a monthly basis to evaluate results and to promote procedure enforcement or changes when needed.

### **Lay-up dynamics**

The achievement of good Lay-up conditions, in the various systems, was obtained through a process of gradual implementation of the Lay-up operating procedure and the resolution of various problems encountered before establishing the desired condition.

Adjustment/optimisation of Lay-up conditions were also gradually introduced on the basis of the experience gained in the field and the technical support of constructors.

The Lay-up operating procedure had to maintain their up dating toward this dynamic characteristics and there was the need for a "Document control system" which should assure proper evaluation and documentation of changes, but also flexibility and rapid response to cope with the out coming necessities.

### **Some human factor coming out from Lay-up operation of the plant.**

The day by day experience during the present phase of Plant operation indicates that Personnel becomes less motivated when they have to perform activities in a situation of uncertainty due to the persistence of the Plant outage :

Personnel tends to perform activities superficially and carelessly. Furthermore there is a concrete risk that activities, which need personal application and skill, are treated in the same manner.

The selection of Procedures coded as 2 and the selection of controls and related frequencies established in the Lay-up Operating Procedures have been weighted and assessed also keeping in mind Personnel reactions to the significance of the activity performed.

Furthermore, actual TS. define the five possible operating condition (Power operation, start-up, hot shut-down, cold shut-down, Refuelling) and give the pertaining requirements.



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It becomes evident in our present experience, that the "Cold Shut down" condition has requirements which are pertinent to a relatively short-period of outage or addressed to assure a safe restart of the Plant after an outage: some requirements, after so a long period of outage, become "out-of-date" or not consistent with a good long term Lay-up and activities performed to comply with them could be felt "non sense" by Personnel.