

Decommissioning of Nuclear Installations in Italy (Jan 2006)

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1 The Italian Nuclear Installations in Decommissioning

All the Italian NPP's are, at present, definitely shut down and, at different stages, in decommissioning.

The **Garigliano** plant (150 MWe BWR), was operated by ENEL from 1963 to 1978. All spent fuel has been removed from the plant and several activities have been performed such as a light decontamination and drainage of the vessel, primary circuit and spent fuel pit; dry low level operational wastes compaction, cementation of liquid and semiliquid (sludge) radioactive wastes, refurbishing of the reactor sphere. All the activities have been performed in anticipation to the approval of the Global Decommissioning Plan.

The **Latina** plant (153 MWe GCR) was operated by ENEL since 1962 until 1987. All spent fuel has been removed from the plant; the primary circuit has been filled with dry air, and blowers and portions of the primary circuit outside the reactor building are being dismantled in anticipation to the approval of the Global Decommissioning Plan.

The **Trino** plant (260 MWe PWR) was operated by ENEL from 1965 to 1987. A limited quantity of spent fuel is still present in the spent fuel pool; no major decommissioning activities have been performed yet, since Authority approval of the Global Decommissioning Plan is still underway.

The **Caorso** plant (860 MWe BWR) was operated by ENEL only from 1981 to 1986. All spent fuel is still present in the spent fuel pool; some major decommissioning activities have been performed, in anticipation of the Authority approval of the Global Decommissioning Plan, which is still underway.

As far as the fuel cycle facilities are concerned, all of them have been definitely stopped and their nuclear materials and/or radioactive wastes are managed, while decontamination and dismantling operations are being planned and defined.

IFEC, a pilot fuel fabrication facility, located at Saluggia, was operated by ENEA from the early sixties till the late eighties to fabricate MTR fuel reloads for the Italian research reactors, as well as the fuel bundles for the HWR CIRENE. Starting from 1990, all the equipment have been decontaminated and removed, all the operating hulls have been decontaminated and released for conventional purposes. This is the only facility completely dismantled.

FN (Fabbricazioni Nucleari), an industrial scale plant for LWR fuel fabrication located at Bosco Marengo, was operated by FN from 1973 to 1995. Most of the nuclear material has been transferred to other sites and the operational dry radioactive wastes have been supercompacted. A remaining quantity of fresh fuel scraps will be shortly removed from the site, while the approval of the decommissioning plan by the Authority is pending.

EUREX pilot reprocessing facility, located at Saluggia, was operated by ENEA from 1970 to 1974 (MTR fuels) and from 1980 to 1983 (Candu fuels). Its main present task is to treat and condition liquid wastes produced in the reprocessing of MTR and CANDU fuel (some 120 m³ ILW and some 100 m³ LLW) and to transfer into dry storage a limited quantity of spent fuel currently in the pool.

ITREC pilot reprocessing facility, located in the southern part of Italy (Trisaia), was operated by ENEA in the '70 (uranium-thorium cycle fuels from the US Elk River reactor). After performing the cementation of the HLW produced by reprocessing a limited number of U-Th fuel, the present task is to solidify the U-Th solution, to manage the historical wastes and to transfer into dry storage the fuel currently in the pool.

PLUTONIUM pilot MOX fuel fabrication facility, located at Casaccia Center, was operated by

ENEA from 1968 to 1974 (process development) and from 1977 to early eighties (MOX fuel fabrication experimental campaigns). After treatment of many radioactive waste streams (mostly high plutonium bearing liquids), the dismantling of glove boxes will be carried out with a special remotely handled installation being completed.

OPEC 1 has been a post-irradiation examination facility, located in the Casaccia Center, operated by ENEA from 1962 to 1990, where activities have been carried out on metal uranium and uranium oxide in a series of Hot Cells. From 1992 to 1998 activities on spent fuel scraps encapsulation and hot cell decontamination have been carried out. The main decommissioning issue is the repackaging and the disposal of spent fuel scraps.

2. Legal and Regulatory Framework

2.1 Nuclear Legislation

The Italian legislation regulating nuclear safety and radiation protection is centered on the following Laws and Regulations.

- Law no. 1860 issued in 1962, which is the Basic Act on the peaceful uses of nuclear energy, as amended by the President's Decree no. 1704 issued in 1965, and by the President's Decree no. 519 issued in 1975. The Law regulates all activities connected with the peaceful uses of nuclear energy. Excluded from the scope of the Law are the nuclear installations for the generation of electricity, which are governed by the procedure laid down in Legislative Decree no. 230/95.
- Legislative Decree no. 230 issued in 1995, which replaced the previous DPR n°185 issued in 1964. Its provisions on nuclear safety and radiation protection apply to all practices involving an ionising risk, including the construction, operation, and decommissioning of nuclear plants. The Decree has been amended by Legislative Decree no. 241 issued in 2000, which has endorsed the European Union Directive 96/29/Euratom laying down basic safety standards for the radiation protection of workers and the public;
- In addition to the above, the Safety Authority publishes Technical Guides, which outline the safety criteria and license application formats acceptable to the Authority in the framework of the licensing procedures.

2.2 Other relevant legislation

Other legislation which has a great impact on nuclear activities are those connected with the potential environmental impacts. The correlation between nuclear safety and environmental legislations are not always clarified, generating potential overlapping and conflicts.

The main reference legislation is:

- Law 8/7/1986, n. 349 which implements the European Commission Directive 85/337/EEC on the *assessment of the effects of certain public and private projects on the environment*, amended by the Council Directive 97/11/EC. The Law has resulted in the following secondary legislation:
- DPCM 377/1988, DPCM 27/12/1988, DPR 12/4/1996, and DPR 3/9/1999 n. 349, defining the technical procedures for the compilation of the environmental impact studies for certain work's categories.
- Council Directive 97/11/EC, amending Directive 85/337/EEC, on the *assessment of the effects of certain public and private projects on the environment*. The Directive in Annex 1 lists, among the projects subjected to an EIA procedure, *nuclear power stations and other nuclear*

reactors, including the dismantling or decommissioning of such power stations or reactors. This Directive has not been completely endorsed in Italy and Authorities do direct reference to the Directive in dealing with plants in decommissioning.

2.3 Competent Authorities

Licenses related to nuclear installations and radioactive materials ownership and handling are granted by the Ministry for Productive Activities (hereafter called MAP, basically the Ministry of Industry), on the basis of the technical positions of the National Agency for Environmental Protection and Technical Services (APAT, previous ANPA).

APAT carries out technical and scientific, regulatory and inspection activities of national interest related to the protection of the environment, and of the water and land resources. It has operational and administrative autonomy under the directives and the control of the Ministry of Environment. For all nuclear activities, APAT acts as the technical body of MAP. Its responsibilities for the licensing process of nuclear installations include:

- assessment of the safety cases presented by the license applicant;
- inspections of equipment and materials during the construction and operational phases for the systematic verification of facility operation safety;
- enforcement action as a consequence of any failure to meet both the licensing conditions and any safety operation criteria.

The Technical Commission for Nuclear Safety and Health Protection from Ionising Radiations (hereafter called Technical Commission), is an Advisory Body of APAT, giving technical advices on safety and health protection issues in relation to the main stages of the licensing procedure. It is composed of experts from ENEA, APAT, and concerned Ministries.

The Ministry of the Environment is the authority responsible for the decisions in the matter of environmental compatibility of nuclear projects, including decommissioning of nuclear power stations.

The EIA Commission (Commissione VIA) is the Advisory Body of the Ministry of the Environment, giving technical advices on the environmental compatibility of the projects.

2.4 Licensing procedures for decommissioning

Licensing procedures are described in the Legislative Decree 230.

In particular, the decommissioning activities licensing, which was not specifically regulated by previous laws, is now regulated by articles 55, 56 and 57 of the mentioned Decree. The applicant shall present a Global Decommissioning Plan and the detailed document for the first phase. The activities must be authorised by MAP after consultation with the Ministries of the Environment, Internal Affairs, Labour, and Health, together with the interested Regional Government and APAT. This authorisation may be granted for single intermediate phases. In this case the documentation for each phase shall include a status report of the plant at the beginning and at the end of the phase and licenses will be issued for each phase.

For each decommissioning phase, the activities to be performed have to be described, together with their safety, environmental and radiation protection implications as well as the initial and final state of the site and the solution envisaged for waste management and waste disposal. The identification and analysis of possible hazard and of accident scenarios for each phase of decommissioning must

be addressed in the application, together with implication for the outside emergency plan and proposal for its updating.

All decommissioning activities must be performed complying with conditions and technical specifications laid down in the decommissioning licence. Systems, components and equipment relevant to safety and radiation protection are subject to a general regime of technical specifications and surveillance tests, either specified in the decommissioning licence or, possibly, in the operation licence for the section still in force. APAT supervises decommissioning operations and carries out inspections to verify compliance with specifications concerning safety and radiation protection.

For the decommissioning of NPPs, the implementation of an EIA procedure is also required. The applicant shall prepare an Environmental Impact Study (EIS) to be approved by the Ministry of the Environment, describing the project, its purpose and scope, and justifying the preferred strategy. The Ministry of the Environment, on the basis of the advice of the concerned Region and of the EIA Commission, and in concert with the Ministry of the artistic and environmental assets, gives its opinion on the environmental compatibility of the proposed project. The EIA process includes a Public Inquiry, whose comments are taken into account by the EIA Commission in making its advice.

3. The initial strategy

When the Interministerial Committee for the Economical Planning (CIPE), a Governmental Body in charge of the strategic decisions on NPP's, decided the definitive closure of all NPP's, at the same time it instructed their owner and licensee, i.e. the National Electric Company ENEL, to start the actions for their decommissioning, according to the "Safe Enclosure" strategy.

However, all necessary consequent acts to support this strategy, and specifically funding mechanisms were not in place.

Other fundamental problems were not solved (and they are not yet solved):

- a national site for the disposal of low and intermediate level waste;
- a centralised interim storage facility for spent fuel and high level waste.

Another difficulty was the uncertainty in the definition of the rules for the management of very low level waste (clearance levels).

A substantial novelty in the field was the Legislative Decree no. 230, issued only in 1995, including new, specific rules on the decommissioning of nuclear plants.

In this situation the decommissioning operations on shut down power plants underwent significant delays and all nuclear installations were practically maintained in safe conditions only for several years.

Meanwhile consideration has been given to the possibility of a change of strategy, taking into account:

- the lack of significant occupational dose advantages in deferring decommissioning for decades, after the initial decay;
- the risk of losing the necessary specific competences in a country without an active nuclear program for energy generation
- the possibility of site reuse for industrial purposes, claimed also by many Local Authorities.

At the same time ENEA, the Italian State Agency for Research in the nuclear field among others, started with the conditioning of the existing wastes in the Nuclear Fuel Cycle installations, plagued by the financial problems, since funds have not been accumulated for their decommissioning. Therefore the most important issues were not addressed with the necessary emphasis.

4. The Current Strategy and the Mission of SOGIN

Until recently the activities in the field of waste management and decommissioning have been carried out by the owners and licensee of the nuclear installations (ENEL for power plants and mainly ENEA for other facilities), without co-ordination in absence of a common strategy.

In the context of the privatisation and liberalisation of the electric energy market, and according to the Legislative Decree March 16 1999 n. 79, all ENEL's liabilities and assets (including manpower and resources) related to nuclear power have been assigned to a newly established company, named SO.G.I.N. (Società Gestione Impianti Nucleari, hereafter SOGIN). SOGIN has been operational since November 1st 1999; its shares have been transferred on November 3rd, 2000 to the Ministry of Economy. In accordance with a long term strategy of coordination of decommissioning programs, licenses of the ENEA and FN facilities have been transferred to SOGIN in 2003 to complete the decommissioning activities until site release from any radiological constrain. At the beginning of 2005 the property of the FN plant has been transferred to SOGIN and its current name is "Bosco Marengo".

SOGIN mission and technical directives are issued by MAP. At the end of 2004 they have been updated and they currently cover:

- the decommissioning of the NPP's and of the fuel cycle installations in Italy by 2024;
- the disposal of the radioactive wastes resulting from the past operation and from the dismantling activities;
- the spent fuel management;
- the valorization of the sites;
- any other activity for third Parties in Italy and abroad to make the best use of the structures and competences
- in addition, SOGIN will support MAP on the identification and characterization of the national repository

5. Current programs and main issues

5.1 Some aspects and key points

Sogin has revised all decommissioning programs according to the Government's guidelines and the urgency indicated by the Government special Commissioner for safety and security, with the target of reaching the complete radiological release of all NPP's sites within 2024. Also the entire program of decommissioning of other nuclear installations will be completed by 2024. Of course sites will not be released, if a repository will not be available on time, as discussed later.

The new plan defines the schedule of main activities on each site, with a view to the optimisation of costs and resources of the entire Italian system. As for the techniques of decontamination and dismantling that will be used, detailed technical aspects in some cases have still to be defined. Considering in particular the level of contamination and other technical and economic factors, different procedures for chemical and/or mechanical decontamination for main components are under evaluation.

Difficulties related to the decommissioning programs are mainly connected to the facts that all NPP's are of different technologies, all of them are stand alone, they are quite far from each other and the local social context is quite different. The same difficulties apply to Fuel Cycle installations.

All decommissioning activities are performed complying with conditions and technical specifications laid down in the decommissioning license. The systems, components and equipment relevant to safety and radiation protection are subject to a general regime of technical specifications and surveillance tests, either specified in the decommissioning license or, possibly, in the operation licence for the sections still in force. Moreover special technical requirements applicable to new equipment or new specific operations are laid down on a case by case basis after a preliminary safety and radiation protection analysis.

The concept also applies to the use of new technologies, for which adequate experimental tests are often required. Special emphasis is given to radiological characterisation of the installation and of materials.

APAT supervises decommissioning operations and carries out inspections to verify compliance with technical specifications concerning safety and radiation protection.

Main uncertainties connected with the implementation of the program are linked with the specification for the repository, and with the date of its actual availability.

5.2 Clearance Levels

The definition of clearance levels is particularly relevant, since the decommissioning of a nuclear plant produces a relevant amount of solid materials, most of which presents very low levels of radioactivity, such to allow their reuse or disposal as conventional wastes. It has also a strong impact on:

- the characterisation of the plants,
- the decontamination processes,
- the methods of materials control,
- the amount of material to ship to the future national repository.

A general criterion is in force in Italy for unrestricted release. Radioactive materials can be unconditionally released from regulatory control if the radionuclides concerned comply with both a concentration and a radioactive half life threshold:

- $C \leq 1 \text{ Bq/g}$, and
- half-life < 75 days.

If both conditions above are not complied with, a specific authorisation is required for releases, reuse and recycle of the materials concerned. The authorisation is given on the basis of an analysis which has to demonstrate compliance with the basic 'below regulatory concern' criterion below, both conditions of which must be met:

- a) Effective dose $\leq 10 \mu\text{Sv/year}$, and
- b) either Effective collective dose $\leq 1 \text{ man}\cdot\text{Sv/year}$ or the analysis demonstrates that exemption is the optimum option.

An example of application of the above criteria for solids is the recent authorisation for decommissioning of the Caorso NPP. The thresholds for the various nuclides are shown in the following table.

Nuclide	Metal material		Building rubble		Other materials
	Bq/g	Bq/cm ²	Bq/g	Bq/cm ²	Bq/g
H3	1	10.000	1	10.000	0.1
C14	1	1.000	1	1.000	0.1
Mn54	1	10	0.1	1	0.1
Fe55	1	1.000	1	10.000	0.1
Co60	1	1	0.1	1	0.1
Ni59	1	1.000	1	10.000	0.1
Ni63	1	1.000	1	10.000	0.1
Sr90	1	1	1	100	0.1
Sb125	1	10	1	1	0.1
Cs134	0.1	1	0.1	1	0.1
Cs137	1	10	1	1	0.1
Eu152	1	1	0.1	1	0.1
Eu154	1	1	0.1	1	0.1
α emitters	0.1	0.1	0.1	0.1	0.01
Pu241	1	1	1	10	0.1

For metal scrap, ad hoc technical specifications have been provided for, with a view to controlling the final destination of the metal material meant for foundry; for instance, the foundry will be required to mix the metal scrap from the plant with uncontaminated scrap in a 1/10 ratio.

No specific criteria are provided for in the Italian legislation for the release of regulated facilities and/or sites, although the general criteria stated above obviously apply. As an aid to determining release levels the recommendations of the European Commission's Publication 113 can be used.

6. The management of radioactive wastes and spent fuel

6.1 Waste classification

Technical Guide no. 26 issued by ANPA (now APAT) classifies radioactive wastes in three categories according to their radiological characteristics:

- First category wastes are those that, within a few months or in a few years as a maximum, decay to a radioactivity concentration lower than the values for disposal into the environment specified in accordance with Italian legislation. Wastes of this category are mainly generated in biomedical and in research activities.
- Second Category wastes are those that, in a time period varying from a few decades to a few centuries, decay to a radioactivity concentration in the order of some hundreds of Bq/g. Second category wastes are typically produced in nuclear facilities during plant operation and in a few biomedical, industrial and research activities; this category also includes parts of wastes arising from plant decommissioning.
- Third Category wastes are identified as that not belonging to the previous categories. Waste of the third category needs a thousand or more years of decay to a radioactivity level of some hundreds of Bq/g. Third category includes high level waste arising from industrial spent fuel reprocessing, and waste arising from plutonium handling facilities (MOX fuel fabrication). The spent fuel to be directly disposed of belongs also to Third Category.

The Guide provides also detailed criteria for the safe management of category 2 wastes, while generic indications are provided for category 3 wastes.

6.2 Waste inventory

The present inventory of Italian radioactive waste can be summarised as follows:

- Low and Intermediate Level Wastes:
 - ~ 25.000 m³, stored at the sites of origin (power plants, experimental fuel cycle facilities, research centres, etc), and mainly not conditioned;
 - ~ 500 ton/year, annual generation;
 - ~ 50.000÷60.000 m³ to be shipped to the national repository, including those produced by the dismantling of the nuclear plants;
- High Level Wastes:
 - ~ 9.000 m³ produced by the dismantling of the nuclear plants and other installations;
 - ~ 75÷150 m³ vitrified wastes back from the reprocessing of spent fuel;
 - ~60÷70 dry storage casks

6.3 Spent fuel inventory and management

Since the beginning of nuclear activities, Italy had pursued the reprocessing option using foreign reprocessing facilities.

The adoption of the reprocessing option was justified by the strong involvement of Italy in the fast reactor program. In this connection, "service agreement" contracts were stipulated by ENEL with BNFL.

After the political decision to stop all nuclear power activities in Italy, the shipments abroad of spent fuel for decommissioning were practically suspended.

At present, the inventory of spent fuel present in Italy, present in Nuclear Power Plants and plants of the fuel cycle, can be summarised as follows:

- ≅ 230 ton U-Pu from NPPs,
- ≅ 60 ton U-P from the ENEL participation to "Superphenix",
- ≅ 4 ton U-Pu-Th from ENEA installations of various origin.

SOGIN has completed the shipping of the spent fuel covered by the existing contracts with BNFL. The remaining fuel will be covered by a new reprocessing contract currently under negotiation. The option of on-site dry storage has shown to be impractical because of the strong opposition of local authorities.

The only fuel that will not be reprocessed is the Uranium/Thorium fuel which has been shipped from the US NPP Elk River in the seventies. SOGIN is looking to its transfer abroad or, as an alternative, to store it on-site in dry casks.

6.4 Reinforced safety and security provisions

The increased concerns about the international situation and specifically about potential terrorists attacks to sensitive targets, including nuclear installations, the Italian Government has taken specific initiatives, i.e.:

- Declaration of the status of emergency for nuclear installations related to the increase in safety for storage and disposal of radioactive wastes (Prime Minister Decree February 14, 2003).
- Urgent provisions for the disposal, in conditions of the greatest safety, of the radioactive materials displaced in the nuclear plants and stored in different sites of the Italian Regions (Prime Minister Order, March 7, 2003 n. 3267).

According to the Order SOGIN chairman has been nominated as Special Government Commissioner for Safety until December 2003 and SOGIN has been indicated as the operating organization to put in place the orders of the Commissioner. The Order has been renewed in 2004 and 2005 with some modifications for one year.

7. The National repository

Most of the wastes, including spent fuel, are at present stored in the sites where they have been generated, in facilities that were not designed for long term storage. In this connection all parties involved in nuclear activities, and lastly the Government special Commissioner, have strongly emphasised the urgency of a national site for disposal of low and intermediate level waste and at least of a centralised interim storage facility for spent fuel and high level wastes. Moreover, this availability is of paramount importance to make the implementation of the "prompt decommissioning" strategy possible.

Studies have been carried out since the 70's. More recently we mention:

- the ENEA "Site" Task Force (1999-2000) preparing a list of potentially qualified sites, and
- the Parliament/Region Commission preparing a document with a possible path to identify a site and reach the necessary consensus

The problem was raised again with the appointment of the Commissioner delegated to put in existence any initiative for the definition of suitable solutions to allow a centralised management of the radioactive wastes.

A Working Group was established in April 2003 by the Commissioner with the mandate to identify the criteria for the siting and the realisation of a final depository for low and medium activity wastes, taking in consideration both the hypotheses of a surface and a subsurface depository, and on the basis of the following operative criteria:

- retrievability of the wastes,
- long term safety,
- institutional control period no less than 300 years
- data records to keep memory of the deposit also after the institutional control,
- Dose limit to the population no higher than 0,01/mSv/year.

A document with the selection criteria for the site has been prepared by the Group, and presented to the Conference of the Regions, without being discussed.

The Government assigned to the Chairman of SOGIN the identification of a single site for 2nd and 3rd categories wastes.

After a technical evaluation, a site in the south of Italy (Scanzano) has been selected, and included in the Law Decree 14/11/2003 n. 314.

Owing the strong opposition by the local population and authorities, the Decree has been modified by the Law 24/12/2003 n. 368, which for political reasons has not been implemented yet, describing a longer path for the identification of the national repository. A consolidated plan is not available at the moment.

8. Funding

When the Government indicated the new “prompt decommissioning” strategy, SOGIN began a in-depth re-examination of the NPP’s decommissioning costs, taking account of the new strategy. The assessment indicates an amount of ~ 2.650 MEuro for the total decommissioning of the 4 NPP’s (constant money 2001, including spent fuel and waste management costs), and ~ 860 Millions of Euro for the decommissioning of the Nuclear Fuel Cycle Facilities.

The main component of the total decommissioning costs is the waste management costs and, in particular, the waste disposal cost which strongly depends on the fees that are required for the disposal in the final repository. In Italy, as the latter has not been designed yet, it is difficult to define a precise figure; about 10 KEuro per cubic meter has been considered.

ENEL accumulated funds during NPP’s operation, but the early closure of these plants has prevented the reaching of the total amount of money necessary for the decommissioning. Additional costs will derive from different economic conditions (new assumed discount rate and taxes), from the management costs of a new company (SOGIN), and from the change in strategy (from SAFESTORE to DECON).

ENEA has not accumulated any fund for decommissioning.

A Decree of the Ministry of the Industry issued on January 26th, 2000 states that funds needed for decommissioning shall be complemented by a levy on the price of the sold kWh. However, since 2005, a large part of this levy has been taken by the Government to alleviate the difficult economic situation of the country and SOGIN has been obliged to use part of the fund, accumulated by ENEL.

9. Recent achievements

Trino NPP: asbestos removal from Controlled Area is underway; the plant water supply has been completely renewed and change from river water to well water. Dismantlement project of the Nuclear Island is completed and waiting the approval of the Decommissioning Plan by the safety Authority.

Caorso NPP: dismantlement of the turbine and other components at turbine floor has been completed. In this area will be assembled the Waste Management Station. The design of the chemical decontamination system (Phadec) is well underway and other activities are to be started, such as the dismantlement of the RHR cooling towers and asbestos removal from the Reactor Building.

Latina NPP: Removal of primary circuit ducts has been almost completed and works in the Turbine Building is underway. Design of the Magnox sludges conditioning is almost completed. As well as the design for boilers removal and for graphite treatment.

Garigliano NPP: asbestos removal from the most difficult areas is underway. Many other activities have been delayed by the lack of Construction permit by local authorities for a waste storage building.

Eurex plant: a new bunkerized tank park will be completed by summer 2006 and will contain the

most radioactive liquid wastes existing on-site produced by the reprocessing activities of the plant. The cementation plant (CEMEX) preliminary design has been completed and presented to APAT for approval. Activities are underway to remove the existing spent fuel from the plant pool and transfer it to an adjacent pool (Avogadro).

Bosco Marengo plant: the fresh fuel scraps are ready to be transported abroad and the transports will be completed by the summer 2006; in order to start the decommissioning activities the final approval of the blasting machine for metal parts decontamination is expected to be received by the beginning of 2006.

Casaccia OPEC and Plutonium plants: the refurbishing of the OPEC 2 building as waste storage will be started soon, after completion of the design and approval of the Safety authorities; underground tanks for liquid wastes will be characterized and removed as soon as possible; the Glove Boxes of the Plutonium plant are being cleaned-up in preparation for their dismantlement.

ITREC plant: the characterization and conditioning of the existing on-site wastes is underway; a new waste storage building will be completed by January 2006; design for the cementation of the U-Th solution and of the removal of wastes trenches are underway; plant modifications to allow the dry storage in casks of the Elk River fuel are underway as well the design of the casks themselves.