Spanish Nuclear Safety Council report to the Parliament

Year 2003 Summary

CSN

Spanish Nuclear Safety Council report to the Parliament

Year 2003 Summary

CSN CONSEJO DE SEGURIDAD NUCLEAR

CSN CONSEJO DE SEGURIDAD NUCLEAR

Spanish Nuclear Safety Council report to the Parliament

Year 2003 Summary

CSN CONSEJO DE SEGURIDAD NUCLEAR

Summary

Presentation

In compliance with article 11 of the law by which it was Created (Law 15/1980), the Nuclear Safety Council submits to the Spanish Congress and Senate the annual report on activities performed during the year 2003. The fourth additional provision of law 14/1999 governing *Public prices and fees for the services rendered by the CSN* changed the frequency of presentation of this document from once every six months to once a year, as a result of which this is the fifth annual report to be submitted to the Parliament.

As may be appreciated from the text that follows, the Spanish nuclear power plants operated correctly throughout 2003, as is demonstrated by the results obtained from the supervision and control activities carried out by the CSN, and confirmed the indicators used to evaluate the operation of this type of facilities. These indicators include parameters such as reactor scrams during operation, forced outages, reportable events, safety system failures, the actuation of these systems and collective exposure to radiation.

The licensees of the Spanish nuclear power plants reported 52 events, 28 less than in 2002. Of these, 51 were classified at Level 0 on the International Nuclear Events Scale (INES), that is to say that they were of no significance from the point of view of safety, and only one was classified at Level 1 on this scale. This last event was the result of anomalies in the authorised operating regime that, although not having a significant impact, point to the existence of deficiencies in safety-related aspects that need to be corrected. This event, which occurred at the José Cabrera nuclear power plant on 6th December 2003, had no significant radiological impact on or off the plant site.

The CSN did not initiate any sanctions proceedings during 2003, but did propose to the Ministry of Economy that it issue three warnings to the licensees of the José Cabrera and Cofrentes plants. However, the non-compliance with the Regulations or Manuals that these warnings referred to did not imply any direct damage to people or the environment.

During 2003, the control of the safety of Spain's nine reactors, at seven sites, by the Nuclear Safety Council led to 205 inspections, 68 decisions regarding authorisations, 21 favourable reports, 8 technical instructions and 6 temporary exemptions from compliance with the Operating Technical Specifications: one for the Santa María de Garoña plant, three for Almaraz, one for Ascó and one for Trillo.

During the year the José Cabrera, Santa María de Garoña, Almaraz Units I and II, Ascó Unit I, Cofrentes, Vandellós II and Trillo nuclear power plants underwent refuelling outages.

Special mention should be made of the progress achieved during 2003 in the safety improvement programmes, in two areas: human resources and reinforcement of inspection activities at nuclear facilities. This continued the efforts made in previous years and was accomplished in compliance with the recommendations made by the Economy and Finance Commission of the Congress of Deputies in its Resolution number twenty-three, dated 9th October 2002, which stated as follows: ... *reinforcement of nuclear power plant inspections is encouraged, in order to achieve 100% compliance with the basic inspection programme and implement inspection techniques prioritising the efforts of the CSN and licensee personnel in aspects of greatest significance for safety.*

The radioactive facilities for scientific, medical, agricultural, commercial and industrial uses operated during 2003 within the established safety standards, in compliance with the measures required for the radiological protection of people and the environment and, therefore, without any situations of undue risk.

The CSN's activities in relation to radioactive facilities have been reinforced with respect to the following strategies:

- Promotion of the implementation of the safety culture through contacts with professional associations and institutions, leading to instructions, guides, recommendations and protocols for action, the analysis and diffusion of operating experience and the incorporation of radiological protection teachings in university and professional curricula.

- Reinforcement of inspection activities, establishing specific programmes for the sectors and facilities providing the least favourable results and for medical radiodiagnosis installations, strengthening indirect controls via radiological protection technical units and services and supervising the activities of the latter.

- Increasing efficiency and effectiveness in the application of standards by simplifying administrative arrangements in licensing processes and the preparation of instructions and guides orienting the licensees regarding optimum compliance with requirements for the granting of authorisations and the adequate application of the safety and radiological protection measures required by the regulations.

- Consolidation and extension of the assignment of CSN functions to the Autonomous Communities, promoting the establishment of new assignment agreements and the extension of those already in place and implementing mechanisms for the coordination and control of the activities assigned.

As of the end of 2003 there were 24,301 radioactive facilities in Spain, 1,354 authorised radioactive installations (one first category, 961 second category and 384 third category) and 22,947 radiodiagnosis facilities included on the different registers of the Autonomous Communities.

The CSN undertakes the control of these facilities both directly and through the Autonomous Communities with which it has function assignment agreements in place.

In 2003, 370 decisions were issued regarding operating, modification and decommissioning authorisations, 71 of which were by the Autonomous Community of Catalonia, two by the Balearic Islands and 35 by the Basque Country, communities that have assigned to them assessment and control functions, in addition to responsibility for inspection.

The following were particularly significant among the control activities carried out:

- 1,535 inspections, of which 700 were performed by the CSN and 835 by the appropriate services of the Autonomous Communities having inspection assignment agreements in place (319 in Catalonia, 175 in the Autonomous Community of Valencia, 65 in Galicia, 169 in the Basque Country, 73 in Navarra and 34 in the Balearic Islands).

- Review of 1,693 operations reports (653 annual reports on radioactive facilities, 800 annual reports on medical diagnosis X-ray facilities and 240 quarterly reports on commercialisation installations).

Mention should be made of the fact that the annual inspections carried out with respect to hospital radiological protection services include indirect control of the operation of the radioactive and X-ray facilities of the hospital itself and of the X-ray installations of the healthcare centres covered by such services (healthcare centres, specialist centres and other hospitals).

Two radioactive materials detection events occurred, one at a metals recovery company in Gijón and the other at a steelyard in Sestao, both of which were duly controlled.

The low and intermediate level radioactive waste management tasks performed by Enresa and the licensees of nuclear and radioactive facilities continued during the year.

During 2003 the CSN has set up a technical group to review the criteria used to date for the planning, organisation and control of the nuclear facilities' site emergency plan drills. The group has completed its analyses and the new criteria, which have been partially applied to the programming and performance of drills in 2003, are expected to be available during the early months of 2004.

The CSN personnel Training Plan has been significantly strengthened, as has the presence of members of the technical staff at international bilateral and multilateral meetings.

Continuing with the work performed in previous years, there has been growing and intensive effort throughout the year at international level, with participation in the activities of groups such as WENRA (Western European Nuclear Regulators Association); INRA (International Nuclear Regulators Association) and the Forum of South American Regulatory Organisations, as well as periodic work for OECD/NEA and the IAEA (international atomic energy organisations), mainly referring to nuclear safety issues, and numerous visits to the United States, France, Great Britain, Germany, Sweden and many other countries by the Council and the technical staff of the CSN, with a view to debating different aspects of nuclear and radioactive facility safety at meetings, seminars, congresses and other events.

1. Tracking and control of facilities and activities

1.1. Nuclear Power Plants

Operation

The Spanish nuclear power plants operated correctly throughout 2003, as is evidenced by the results of the CSN's supervision and control activities and confirmed by the indicators used to assess the operation of these facilities. These indicators include parameters such as automatic scrams with the reactor critical, forced outages, significant events, safety system failures and actuations and collective exposure to radiation, as indicated in figure 1.

The following may be singled out as being among the main overall findings of the 2003 programme:

- In the long term, all the indicators except the *Average number of automatic scrams with the reactor critical* and the *Average number of significant events* have shown a downward trend over the 10-year period analysed. Almost all the indicators have also shown a downward trend in the short term, the only exception being a slight increase in two of them over the last three years, these being the *Average rate of forced outages* and the *Average collective exposure to radiation*.

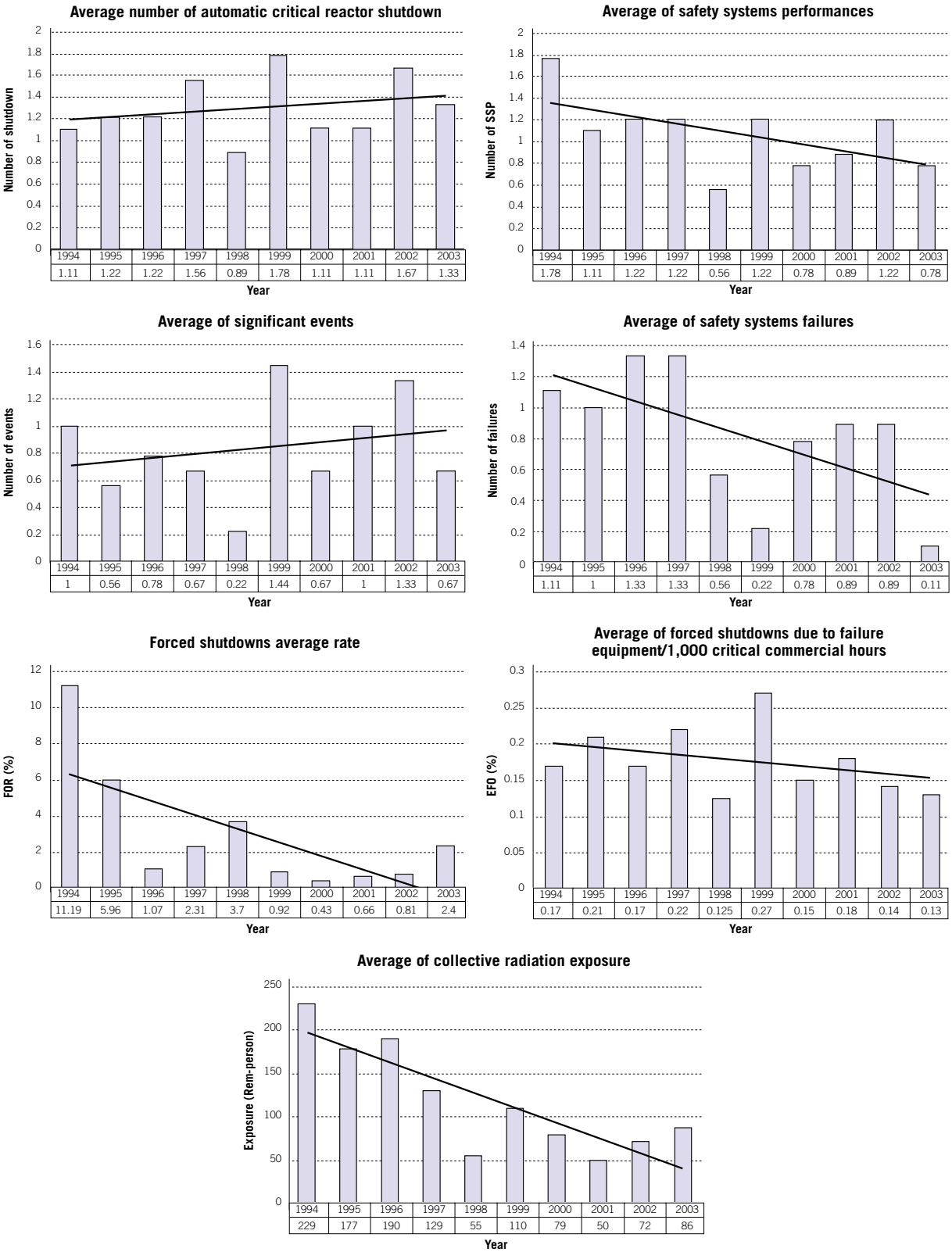
  – *Average number of automatic scrams with the reactor critical:* An unfavourable change in tendency is observed for this indicator in the long term, caused jointly by elimination of the figure for 1993, which was very high, and the values for 1999 and 2002, which determine the upward slope of the graph as from this year. In the last three years, however, there has been a change in the trend of this indicator, which is currently slightly on the decrease, a favourable circumstance that allows its recent evolution to be considered satisfactory.

  – *Average number of safety system actuations*: This indicator continues its favourable long-term downward trend. To this should be added the change in tendency observed in the last three years, which is also one of slight decrease, a circumstance that allows both the long and short-term evolution of this indicator to be satisfactory. Nevertheless, over the last three years the contribution made by this indicator at power has shown an upward trend, this contrasting sharply with the decreasing trend observed during outages. This increasing trend under power conditions should be tracked in order to determine whether or not it continues in the coming years. It should also be pointed out that the number of spurious actuations in 2003 was particularly high, this reducing the significance of the data obtained.

  – *Average number of significant events*: The long-term change in the trend of this indicator continues. It is still slightly on the increase, due to the unfavourable contributions in 1999 and 2002, but shows a clear evolution towards stabilisation. A symptom of the above is the short-term behaviour of this indicator, which has improved significantly, with a change to a pattern of decreasing values. The contributions made at power and during outages are also decreasing, as a result of which the overall evolution of this indicator may be considered satisfactory.

  – *Average number of safety system failures*: In the long term, this indicator shows a strong trend downwards, this being observed also over the last three years. This trend is reflected in the contributions made at power and during outages. Consequently, the evolution of this indicator may be described as

Figure 1. Nuclear power plants performing indicators



being highly favourable in both the short and long term.

– *Average rate of forced outages*: Although the trend shown by this indicator in the long term is strongly downward, its short-term evolution has varied, and is now one of increase. The reason for this is the extension of the refuelling outages in 2003, fundamentally at the Almaraz II, Cofrentes and José Cabrera plants, caused respectively by the breakdown of a diesel generator, the new flow measurements required in the component cooling water and essential services water systems and the refuelling incidents that occurred at José Cabrera. The measurement of flows at the consumers of the component cooling water and essential services water systems was a CSN requirement, based on the deficiencies that were being encountered in these systems, and has caused delays in some refuelling outages due to problems with the measuring instrumentation or to the fact that the acceptance values established were not sufficiently adjusted to the needs or capacities of the systems. For the time being, no specific tracking of the evolution of this indicator is considered necessary.

– *Average number of forced outages due to equipment failures per 1,000 hours of criticality in commercial operation:* This indicator continues to show a downward trend, in both the long and short term. This is considered to be a favourable trend and in keeping with the assessment of the causes for the short-term increase in the indicator *Average rate of forced outages,* since such forced outages have not been due fundamentally to equipment failures.

– *Average collective exposure to radiations*: Despite the continued downward trend in the long term, this indicator shows an unfavourable change in trend in the last three years. The cause for this is to be found mainly in the high values given by Cofrentes nuclear power plant, although individual analysis reflects a slight but continuous increase for all the Spanish nuclear power plants.

As regards the causal factors that have contributed to the events reported to the CSN during the last three years, also broken down by nuclear power plant operating mode, the following may be underlined:

- The *Administrative Causes* show a favourable change in tendency, both during power operation and during outages. The trend is now a downward one.

- A slight upward trend may be observed for the indicator *Licensed personnel errors* under power operation conditions, a trend that is not observed during outages, where it decreases strongly. The events that occurred at Cofrentes during the first quarter of 2002 continue to have a strong influence.

- The indicator *Other personnel errors* shows a favourable change in trend and is now on the decrease during both power operation and outages.

- The indicator *Maintenance Causes* shows a favourable downward trend, during both power operation and outages, this also meaning a favourable change in its evolution.

- A favourable change in trend may also be observed for the indicator *Design Causes,* which is now slightly downward at power and strongly downward during outages.

- An increase may be observed for *Miscellaneous Causes* both under power conditions and during

outages. These are due fundamentally to atmospheric disturbances, spurious electrical component failures and the transients experienced at Ascó as a result of avalanches of algae in the river Ebro.

In applying the requirements of the Operating Technical Specifications of each plant, the licensees reported 52 events, 28 less than in 2002. Of these, only one event was classified at level 1 on the International Nuclear Event Scale (INES), the rest being classified at level 0. Events classified at level 1 are the result of anomalies in the authorised operating regime that, although not having a significant impact, reveal the existence of deficiencies in safety aspects that need to be corrected. They have no significant radiological impact either on or off the plant site.

The event classified at level 1 on the INES Scale occurred at the José Cabrera nuclear power plant on 6th December 2003. Following the implementation of a design modification on the vessel safety injection lines, which included the installation of retention valves aimed at improving the isolation of the pressure boundary in the safety injection (SI) system piping, the resident inspection detected that the test required by Operating Specification (OS) 4.5.2.g (balance of flow during outages following modifications to the safety injection (SI) system potentially altering flow characteristics) was being performed incorrectly. The failure of a safety injection system pump had been contemplated, but not that of the discharge valves on the associated train, as required by the redundancy and single failure criteria for the accident scenarios postulated.

The CSN required the licensee of the José Cabrera plant to repeat the SI system flow balance test correctly, this being carried out on 6th December 2003. On this occasion the test was performed in accordance with the criteria required to guarantee the operability of the system, i.e., the individual start-up of each SI system pump along with the opening of the two associated injection valves. The result of the test was a flow below the corresponding acceptance criterion of 260 m^3/h, this leading to the inoperability of both SI system trains in the operating modes in which they are required.

At that time the plant was in the shutdown condition, for which reason the system was not required to be operable. However, given that the situation has existed at the plant prior to performance of the test, the erroneous definition of which was the result of the way in which it had been conceived by Westinghouse during the plant modifications carried out during the 1980's, and in view of the fact that the magnitude of the discrepancies in flow measurement on each train with respect to the test acceptance criterion (10.4% for train A and 7.3% for train B) cannot be due to the loss of load caused by the retention valves installed during the previous modification and that had given rise to the need for the test, it was concluded that the condition of inoperability of the two SI system trains due to insufficient flow existed also in *Modes* 1, 2 and 3, when such operability is required by the operating specifications (OS). The licensee has demonstrated by means of thermohydraulic calculations that the safety of the plant was not compromised at any time, due to the existence of reasonable safety margins. Nevertheless, non-compliance with the acceptance criterion established in the plant OS's in itself constitutes sufficient grounds for classification at level 1 on the INES Scale.

In order to correct this situation, a design modification has been implemented by which, in the event of an accident, an opening signal is generated for the four injection discharge vales from the two safeguards trains, a situation for which the availability of sufficient flow had been verified.

Of the 52 events reported, five were provisionally considered as being *potentially significant* and two as being *potentially generic* by the CSN *Event Review Panel* (ERP). An event is considered to be potentially significant if subsequent tracking of the corrective measures implemented is required, or if it might imply the request for additional measures to be adopted. The classifications presented are still provisional because the ERP will not undertake definitive classification while the subsequent tracking of the event, of its corrective actions or of the subsequent evolution of the nuclear power plant is still open. As regards events definitively classified in previous years, no deviation has been detected with respect to the provisional classification.

During the year 2003, the CSN did not initiate any sanctions proceedings, but did propose to the Ministry of Economy that three warnings be issued to the licensees of the following nuclear power plants:

Warning to José Cabrera nuclear power plant for non-compliance with article 54 of the *Regulations governing nuclear and radioactive facilities* due to its failure to notify the Nuclear Safety Council of a change in the medical fitness of two licensed operators.

Warning to Cofrentes nuclear power plant for various cases of non-compliance (with the *Regulations governing nuclear and radioactive facilities,* the Operating Technical Specifications, OTS's, the Operating Regulations, OR's, and the Quality Assurance Manual, QAM), all associated events occurring during the thirteenth refuelling outage (February - March 2002).

Warning to Cofrentes nuclear power plant for non-compliance with the *Radiological protection manual* (RPM), regarding the prohibition on providing drinking water for workers inside the *Controlled zone.*

In all these cases, the CSN has required the adoption of corrective actions and has established a period for their performance. These cases of non-compliance were considered by the CSN pursuant to article 92.4 of the Nuclear Energy Act, *Law 25/64*, as worded in the *Law governing Public Prices and Fees for the services rendered by the CSN,* and did not lead to direct damage to persons or to the environment.

Inspections and reports

During the year 2003, the control of the safety of Spain's seven operating nuclear power plants (nine reactors) by the Nuclear Safety Council gave rise to 205 inspections, 68 reports on awarding of authorisations, 21 favourable assessments, 8 technical instructions and 6 temporary exemptions from the *Operating technical specifications* for the following nuclear power plants: (Santa María de Garoña one, Almaraz three, Ascó one and Trillo one).

The following were particularly significant:

- Issuing of complementary technical instructions relating to the planning of refuelling activities at the José Cabrera, Santa María de Garoña, Almaraz, Ascó, Vandellós II and Trillo nuclear power plants.

- Issuing of complementary technical instructions relating to the requirement that the licensee implement a series of improvements aimed at preventing the steam generator tube rupture event, and another, 14.3, regarding an action plan to improve the *safety culture* of the José Cabrera nuclear power plant.

- Authorisation of the revisions of the Site Emergency Plan (SEP) of the Santa María de Garoña and Vandellós II nuclear power plants.

- Authorisation of rated thermal power upgrades for the Almaraz I and II nuclear power plants (2,729 MW).

- Authorisation to operate with a maximum thermal power of 3,237 MWt (design modification *Power increase due to flow adjustment,* APAC) for Cofrentes nuclear power plant.

- Authorisation of updating of the *Giralda refuelling outage design and assessment* methodology for Cofrentes nuclear power plant.

- Authorisation of the revisions of the Safety analyses of Almaraz II, Ascó I and II and Cofrentes nuclear power plants.

- Approval of the revisions of the operating regulations of José Cabrera, Santa María de Garoña and Cofrentes nuclear power plants.

- Approval of the Improved Operating Technical Specifications of Santa María de Garoña and Cofrentes nuclear power plants.

- Favourable report on the *Radioactive waste management plan* of the Almaraz, Ascó, Vandellós II and Trillo nuclear power plants.

- Approval of the revisions of the Operating Technical Specifications of the José Cabrera, Almaraz, Ascó, Vandellós II and Trillo nuclear power plants.

- Favourable report on extension of the authorisation for the importing, exporting, handling, processing, storage and transport of nuclear materials for the Almaraz, Ascó and Trillo nuclear power plants.

- Favourable report on temporary exemption from compliance with sections 3.8.1.1.b, 3.0.4, 3.0.5, 3.3.2.1 and 3.3.3.5 of the Limiting Conditions for Operation of the Operating technical specifications, necessary for start-up from mode 1 of Group II of Almaraz NPP, without diesel generator 4DG being operable, for a maximum period of 30 days and with the adoption of compensatory measures by the licensee, these consisting fundamentally of installing a group of 6 portable diesel generators having a higher capacity than diesel generator 4DG and of having a team of maintenance people dedicated to this issue 24 hours a day, in successive shifts.

During 2003 there were refuelling outages at the José Cabrera, Santa María de Garoña, Almaraz I and II, Ascó I, Cofrentes, Vandellós II and Trillo nuclear power plants.

1.1.1. Safety improvements and generic issues

The safety improvement programmes in which significant progress was made during 2003 have been as follows:

Human Resources

Programmes for safety assessment and improvement in organisation and human factors

The CSN performs activities aimed at verifying that the processes used by the licensees to maintain the staffing levels, skills and motivation of in-house and contracted human resources in all cases guarantee the maintenance and improvement of the nuclear facility safety.

The 18th Resolution of the Commission of Economy and Finance, of the 17th December 2003, states as follows: *the Nuclear Safety Council is encouraged to continue to verify that the processes used by the licensees to maintain the staffing levels, skills and motivation of in-house and contracted human resources guarantee at all times the maintenance and improvement of the safety of nuclear facilities, and further-*

more, the CSN shall inform of such activities in its Annual Report.

The CSN reports on organisational changes at nuclear facilities and on the actions of the Council through, for example, replies to the resolutions of the Commission of Economy and Finance (resolutions thirteen of 9th October 2002 and thirty of 2nd October 2001). The main actions are detailed in the following sections.

Inspections were performed during 2003 on the status of implementation of the programmes at the Santa María de Garoña, José Cabrera and Cofrentes plants.

Complementary Technical Instructions on the reduction of human resources

On 27th July 2000, the CSN issued three Complementary Technical Instructions (CTI's) for all the Spanish nuclear power plants:

- Within six months a study should be submitted to the Nuclear Safety Council establishing the minimum technical capacity and staffing requirements of each department of the organisation to guarantee that the licensee exercise effective control of safe plant operation.

- Any changes implying a reduction of the human resources dedicated to the performance of functions relating to the safety or radiological protection of the facility should be analysed and documented by the licensee prior to their implementation, in order to guarantee that these functions continue to be suitable performed.

- During the first quarter of each year, as from 2001, a report should be sent to the Nuclear Safety Council on modifications or actions relating to optimisation of the human resources of the organisation and carried out during the period in question.

In response to the first CTI, all the nuclear power plants submitted the requested study. This was reviewed by the CSN and, as a result, letters were sent to the licensees at the beginning of 2002 containing the preliminary conclusions of the evaluation and requesting additional analyses or justifications with respect to certain aspects of the study. All the plants responded to these.

In relation to the second CTI, the licensees implemented their change supervision and control mechanisms. All the nuclear power plants developed and implemented specific administrative procedures relating to this issue, establishing the responsibilities, scope and analysis and documentation criteria to be applied in evaluating such changes.

Finally, in response to the third CTI, during the first quarters of 2002 and 2003 the licensees submitted to the CSN their annual reports on the previous year, specifying and explaining the changes that had occurred during those years in relation to the optimisation of human resources.

In this respect, it is considered that the licensees are responding to the requirements established by the CSN in relation to the supervision and control of the potential safety impact of changes in staffing levels.

Organisational change evaluation procedures and self-assessment systems

As a complementary measure to the above, the CSN promotes the adoption by the licensees of the main elements of safety management systems and their application to the management of organisational changes. Thus, in addition to the procedures for the initial analysis of organ-

isational changes implying a reduction in human resources, applicable prior to implementation of the changes, a second key element of the management systems is the use of self-assessment tools. These tools should allow the licensee to promptly identify any deviation in safety levels resulting from the organisational changes implemented.

These self-assessment systems are being implemented at all the plants and some of them already possess several years of experience in this area. The systems comprise a set of tools that in some cases are being refined in order for them to also detect specific potential organisational problems (for example operations indicators), or new tools are being incorporated and more intensive use is being made of others.

The documents agreed on between the CSN and the electricity industry in 2003, known as the *Self-assessment programme guideline* and the *Corrective action programme guideline,* constitute a basis for homogenisation of the nuclear power plant self-assessment procedures, such that they meet certain minimum requirements.

These self-assessment procedures will be used to develop tools capable of identifying potential problems relating to organisation in general, and therefore also potential organisational problems arising as a result of changes to the human resources of the facilities.

Likewise, in response to a request by the CSN, and coinciding with the proposals for changes to the operating regulations issued in 2002 and 2003, all the nuclear facilities explicitly incorporated in their nuclear safety and radiological protection functions included in these licensing documents those relating to the implementation of a safety management system contemplating the analysis, supervision and control of the impact on safety of organisational changes, regardless of their nature. In other words, the analysis is of all organisational changes, regardless of whether or not they imply a reduction in human resources. In response to the commitments acquired in relation to the aforementioned operating regulations changes, the plants have already developed such organisational change management procedures.

Implementation of the safety management system and the investment management at the nuclear power plants

In relation to safety management systems, during 2003 the electricity industry submitted a proposal to the CSN regarding the implementation of this type of systems at the rest of the nuclear power plants (the José Cabrera plant was already developing one), in accordance with a process-based management model developed by the United States *Nuclear Energy Institute* (NEI). In 2004 the CSN will initiate a detailed assessment of the technical content of the industry's proposal and of the timeframe for its implementation.

The rest of the Spanish nuclear power plants drew up an industry guideline on investments management (the José Cabrera plant had already initiated its development), which was approved by the CSN in April 2003. Using this guideline as a basis, in 2004 each licensee will prepare the investments management procedures to be used at each nuclear power plant and will begin to apply this systematic approach for the 2005 budgets. The CSN plans to develop an action plan for the assessment of these procedures during 2004 and for the supervision of their implementation.

Specific actions at the José Cabrera nuclear power plant

At the same time, in view of the specific situation of the José Cabrera nuclear power plant, which now has an announced date for completion of its

operational lifetime, and taking into account the consequences that this circumstance might have for nuclear safety, a condition was applied to this plant in its latest *Operating permit* that required it to develop an *Integrated Safety Management System* and submit it to the CSN for approval before 14th April 2003. The objective was to guarantee that the plant had the duly qualified and motivated personnel required for its safe operation until the definitive end of its operating lifetime.

This proposal was submitted by the licensee and has been subject to CSN assessment and supervision throughout 2003. Certain points relating to external assessments independent from strategic management remain to be resolved, and are expected to be completed during 2004.

Likewise, as from 14th October 2002 and as an integral part of its safety management system, the José Cabrera nuclear power plant had another condition in its *Operating permit* relating to the need to submit, before 14th January 2003, a systematic approach to safety-related investments for study and favourable appreciation by the CSN.

Both this condition and the one relating to safety management systems had been appropriately developed in complementary technical instructions issued by the CSN to guarantee optimum compliance with these requirements established in the authorisation.

The systematic approach to safety-related investments of the José Cabrera nuclear power plant, which was required to also cover investments in organisational areas, was supervised, assessed and inspected by the CSN throughout 2003. This approach has now been implemented by this plant.

Another significant CSN activity in this field, also relating to the José Cabrera nuclear power plant, has to do with the organisational analysis required of the facility following the events that occurred at the beginning of 2002 and affecting the essential services water system. In October 2002, a consulting company of recognised technical experience and independent from Unión Fenosa Generación carried out an organisational analysis of José Cabrera nuclear power plant. This analysis focused on three fundamental aspects: personnel structure and staffing, safety culture and the design basis review process. The analysis techniques used consisted of a documentary review and, especially, interviews with a significant sample of the personnel of the facility, this amounting to some 50 plant and contracted persons occupying different job posts in the organisational structure of the facility.

As a result of this analysis, in January 2003 the nuclear plant submitted an organisational action plan to the CSN, this being approved by the Council at the end of February 2003. This action plan addressed issues relating to the staffing of certain departments, the development of an internal communications plan, the development of a future professional career plan, etc. The CSN also required the licensee to systematically repeat the aforementioned organisational analysis (personnel interviews) in order to assess whether the interventions contemplated in the action plan designed by Unión Fenosa Generación were achieving the improvement objectives pursued at the plant. Additional analyses were performed in April and October 2003, and the licensee developed specific indicators based on this approach. The CSN carried out a detailed follow up of the implementation of this organisational action plan.

Specific actions at Cofrentes nuclear power plant

Another significant activity relating to incidents having an organisational component was carried out at the Cofrentes nuclear power plant. During the 2002 refuelling outage, a number of operational incidents occurred at this plant and required attention from both the licensee and the

CSN. In response to these incidents, the licensee performed a self-assessment that led to the proposal for an action plan. This action plan was revised by a multidisciplinary team of CSN inspectors. One of the tasks foreseen by the licensee within the framework of the plan was the performance of an organisational analysis, by a company independent from Iberdrola, using a methodology specific for such purposes. The methodology in question originated in the USA, was fully developed in Canada and was subsequently adapted to the Spanish nuclear environment within an R&D project including the participation of Unesa and the CSN. This methodology was successfully applied in the performance of organisational assessments at the Santa María de Garoña nuclear power plant in 2001 and at Ascó in 2002.

This preventive way of working makes it possible to analyse the organisation and management of a nuclear power plant. It is based on an adaptive organisational model derived from the bureaucratic machine of Henry Minztberg and on a set of organisational factors having an impact on safety. The methodology uses four data acquisition tools: questionnaires, interviews, BARS *(Behavioural Anchored Rating Scales)* and observations. The treatment of the significant quantity of data obtained allows a diagnosis to be performed on the organisational aspects of the nuclear power plant.

The methodology was applied at Cofrentes in December 2003, the final results report being scheduled for submittal on 31st March 2004. The licensee will be required to adopt the appropriate corrective measures depending on the results of the analysis. The methodology is expected to be applied at another Spanish nuclear power plant, foreseeably Almaraz or Trillo, in 2004.

Labour force adjustment plans at the Trillo-Almaraz and Cofrentes nuclear power plants

During the year 2003 the Almaraz-Trillo and Cofrentes nuclear power plants have approved labour force adjustment plans. In the case of Almaraz -Trillo, this plan is applicable to the personnel of on-site departments at the two plants (since in 2001 a plan was signed for the personnel of corporate or common departments) reaching the age of 58 before the end of 2007. In the case of Cofrentes nuclear power plant, the plan is applicable to all members of the personnel reaching the age of 58 before the end of 2006. In both cases, the licensees have submitted reports to the CSN on the specific characteristics of their labour force adjustment plans and of the management systems implemented and foreseen to guarantee that these plans will have no impact on safety. The CSN has initiated its evaluation of the plans and is currently drawing up an action plan for their supervision throughout 2004.

Reinforced inspection activities

The objective in this case is to improve and reinforce inspection activities, taking into account Resolution 23 of the Commission of Economy and Finance of the Congress of the Spanish Parliament, dated 9th October 2002, which states as follows: *... a reinforcement of nuclear power plant inspections is encouraged, in order to achieve 100% compliance with the basic inspection programme and implement inspection techniques prioritising the efforts of the CSN and licensee personnel in aspects of greatest significance for safety.* In this respect, in early 2002 the CSN, as a first step in what was to be a further-reaching project, initiated weekly tracking of the planning and performance of the *Basic inspection programme*, with a view to ensuring its one hundred percent performance. This basic inspection programme is a minimum set of checks that are carried out through control inspections at all nuclear facilities within the established time periods. The inspections of this basic programme are aimed at verifying the actual operating conditions

of the facility in order to confirm suitable operation or promptly identify possible problems.

The inspection activities corresponding to the Basic inspection programme have been, and continue to be, analysed to check that the expected results are acceptable. With this aim in mind, subject-specific meetings are held to systematically analyse the inspections performed by the personnel of the technical directorate of nuclear safety, in order to check that the objectives of such inspections and the criteria and procedures used have the necessary depth and a scope similar to that used in the USA by the Nuclear Regulatory Commission (NRC), within its risk-informed supervision of the operation the American nuclear power plants (Reactor Oversight Program).

Risk-informed inspection implies taking into account the factor of significance for risk when planning and performing inspections and assessing their findings, such that the necessarily limited resources dedicated to inspections may be brought to bear on truly important issues, and the establishment of a quantitative target criterion to determine the significance of the findings, such as the measurement of risk.

Furthermore, within the CSN work began on the definition and performance of multidisciplinary risk-informed inspections, such that the scope of these inspections focuses on those systems which, according to the information gleaned from the probabilistic safety assessments carried out at each of the facilities, have been identified as the most important for risk reduction. These inspections are performed by one or more inspection teams made up of experts in the different technical areas to be analysed, within each system inspected, in order to verify that the system performs its functions correctly. In addition, unannounced nuclear power plant inspections have been carried out during 2003, these being listed in subsequent sections.

As a result of the above, a series of activities were initiated in 2003 with a view to implementing risk-informed inspection, these consisting fundamentally of developing the necessary tools, training the inspectors in the concepts of the methodology and gradually applying these concepts in subsequent inspections. These activities are part of a plan for the gradual implementation of risk-informed inspections, which in the initial phase will have a limited scope including application to certain nuclear safety inspections carried out at the nuclear power plants, this scope being extended in future phases to include other inspections in the same discipline.

The initial phase of implementation of risk-informed inspection will be carried out over a period of two years. This began effectively in the third quarter of 2003 with the contracting of an engineering company for performance of the scheduled activities, as a result of which the application of this methodology began during that quarter in an inspection relating to the design and operational capacity of the safety systems of one of the Spanish nuclear power plants, Almaraz. In the last quarter of 2003, and taking into account the lessons learned from the initial experience, the preparation of another inspection of the same type was addressed, this to be carried out at the Santa María de Garoña nuclear power plant in early 2004. This would subsequently be perfected and extended throughout 2004 to include other plants and other types of inspections.

The experience acquired in the performance of multidisciplinary inspections has proven to be very adequate, although there are still aspects that remain to be polished in order to optimise the assignment of resources and take the fullest advantage of the synergies occurring in this type of inspections.

Among the activities foreseen, and as a complement to the seminars that are already being organised on risk-informed inspection, are generic training courses on probabilistic safety assessment for inspectors during 2004 and 2005, as well as other measures aimed at spreading the use of the information provided by such probabilistic safety assessments, such as the implementation of an information system on Spanish probabilistic safety assessments. This will reside in the now partially operative CSN internal computer network, another action undertaken during 2002 and 2003 and still on-going.

Among the objectives mapped out to reinforce inspections at all the nuclear facilities, a mention may be made of the fact that during 2003 inspection activities were increased.

In 2001, the CSN dedicated approximately 36,600 hours to nuclear facility inspection, this figure increasing to 44,518 hours in 2002 and to 56,084 hours in 2003. The total number of inspections performed in 2002 was 273, with 283 performed in 2003.

As regards the nuclear power plants, the inspection efforts made at these facilities by the head office inspectors constituted an increase of 25% over 2002, and almost 100% with respect to 2001, this bringing the inspection function closer to the role it should play for the CSN to satisfactorily fulfil the missions assigned to it.

By way of an overall evaluation of the performance of the inspection programme, the execution of the *Basic inspection programme* may be said to have reached one hundred percent and to have satisfactorily achieved the objectives mapped out for 2003; furthermore, the results obtained in previous years were clearly improved and the quantitative aspect is considered to be highly satisfactory. Maintenance of this quantitative level is implying an improvement in the qualitative aspects of the inspections (objectives, scope and aspects to be checked during inspections), in the treatment of deviations detected, the evaluation of their importance and the most adequate corrective actions in each case.

The CSN also undertakes the monitoring of the so-called generic issues, which are problems potentially affecting various plants and that are generally discovered as a result of the analysis of events occurring in the nuclear industry or of research programmes.

1.2. Fuel cycle and waste disposal facilities and research centres

During 2003, the CSN performed 46 inspections and issued 12 reports on awarding of authorisations relating to this type of installations, two favourable assessments, three temporary exemptions, one sanctions proceeding against the El Cabril Disposal Facility and no technical instruction or warning.

As a result of the proposal for sanctions proceedings agreed to by the Council in its meeting of 15th July 2003, the Directorate General for Energy Policy and Mines issued a Resolution on 16th December 2003 applying a sanction against the licensee of the El Cabril Disposal Facility. The reason for this was the lack of information provided to the CSN on the existence of an amount of water in the collecting vat of cell N-16, which complicated the appropriate control of the installation.

The following are particularly significant among the proceedings initiated:

- Authorisation for the new implementation of equipment in the ceramics and mechanical areas, associated with revision 18 of the Safety Report and revision 20 of the Operating Speci-

fications of the Juzbado fuel assembly manufacturing facility.

- Favourable assessment regarding extension of the authorisation for the importing, exporting, handling, processing, storage and transport of nuclear materials of the Juzbado fuel assembly manufacturing facility.

- Authorisation for temporary exemption from compliance with *Operating specification 11.2* regarding the accepted period of inoperability of the electricity generating group of the Juzbado fuel assembly manufacturing facility.

- Authorisation for temporary exemption from compliance with action 5.3.3.2. of *Operating specification 5.3* regarding water supply for the general fire extinguishing system of the Juzbado fuel assembly manufacturing facility.

- Authorisation for *revisions 15 of the Operating regulations and 12 of the Site emergency plan,* which establish that in operating modes 2 and 3 there shall be a licensed operator qualified to undertake the functions of emergency manager for the Juzbado fuel assembly manufacturing facility.

- Authorisation of the modification for provisional use of the El Cabril definitive disposal cells for the temporary storage of radioactive wastes generated during events at steelyards.

- Authorisation of the 6th revisions of both the *Safety Report* and the *Operating technical specifications* of El Cabril.

- Authorisation of temporary exemption from compliance with Operating Technical Specification 4.5, requested by Enresa for incineration of compactable radioactive wastes generated by nuclear facilities, with a view to technically and economically assessing this management option against that currently implemented at the El Cabril facility.

- Authorisation to declare the definitive shutdown of operations at the Quercus uranium concentrates mill, establishing a period of one year for submittal of a request for dismantling authorisation.

- Authorisation of the modification of Ciemat installation IR-15, radioactive waste and materials laboratory.

- Authorisation of an extension for the performance of handling and storage activities, within the framework of Royal Decree 158/1995 on the physical protection of nuclear materials at Ciemat.

1.3. Facilities in the dismantling and decommissioning phase

During the year 2003 the Nuclear Safety Council carried out 27 inspections and issued three reports on awarding of authorisations , one favourable assessment and no exemptions, technical instructions, warnings or sanctions proceedings in relation to this type of facilities, which are subject to specific surveillance and control programmes.

The following were particularly significant among the proceedings initiated:

- Authorisation for the design modification of the water supply system for the facility's fire-fighting system and of revision 2 f) of the Technical specifications for the *Vandellós I nuclear power plant dismantling and decommissioning plan*.

- Favourable report on a new use for the temporary storage facility for containers with preconditioned wastes from the graphite silos

(ATOC) for the storage of radioactive wastes arising as a result of the dismantling activities contemplated in the *Vandellós I nuclear power plant dismantling and decommissioning plan.*

- Authorisation via a Resolution by the Directorate General for Energy Policy and Mines on 19th June 2003, following a report by the Nuclear Safety Council, for extension of the period of compliance as to the site to 30th June 2004, in order to check the variation of certain parameters of the Lobo-G Plant surveillance and control programme.

- Declaration of decommissioning of the Argos reactor at the Polytechnic University of Catalonia, via an Order from the Ministry of Economy on 23rd December 2003, following a favourable report by the CSN dated 2nd October 2003.

As regards the *Vandellós I nuclear power plant dismantling and decommissioning plan (DDP),* as of the end of 2003 the activities for dismantling of the active parts had practically reached 100%. Certain batches of declassified materials and radioactive waste remain to be removed, and the new facility perimeter fence for the latency period still has to be relocated and equipped with security measures and systems. A significant activity performed during 2003 has been continuation of the refinement of the soil radiological characterisation methodology, with a view to the partial release of the land on the site.

As a result, the most relevant activity pending is the release from regulatory control of part of the land on site. This process will be carried out under the direct supervision of the CSN, and will take effect following issuing of the corresponding Ministerial authorisations. The process of authorising such release has undergone some delay with respect to the schedule initially foreseen for the project, due to the complexity involved in analysing and evaluating an aspect that is something of a novelty in the current regulatory framework and that will in addition establish important references for the future.

At the Elefante Plant, the year 2003 has seen the conclusion of 80% of construction of the clay layer (90 cm in thickness) covering the surface of remodelled areas and acting as a protection against the emission of radon. Above this layer, the construction of a cover of mining tailings (90 cm in thickness) acting as a protection against erosion has now advanced to 70%. Finally, work has begun on the construction of a top covering layer of soil which will be used for the planting of autochthonous colonising plant species.

The construction of these layers is subject to the requirements of the following official dismantling documents: *Quality assurance programme, Decommissioning plan construction specifications* and *Performance procedures and scheduled tests*.

During 2003 inspections have been carried out at the *Andújar uranium mill (AUM)* to verify the general, hydrological, geological and radiological surveillance conditions imposed by the surveillance and maintenance plan for the site compliance period. Likewise, an inspection was performed to check the extent of the effects caused by the intrusion of burrowing animals. No significant deviations were found with respect to the programme established.

In response to a CSN request, the licensee submitted a new *Surveillance and maintenance plan for the restored AUM site,* in compliance with the requirements of the authorisation in force. This is being evaluated.

During 2003 inspections have been carried out at the La Haba Lobo-G plant to verify the general, hydrological, geological and radiological surveillance conditions imposed by the surveillance and

maintenance plan for the site compliance period. No significant deviations were found for any of these parameters with respect to the programme established.

1.4. Radioactive facilities

The Council estimates that throughout 2003 the operation of scientific, medical, agricultural, commercial and industrial radioactive facilities has taken place in compliance with the safety standards established, with adherence to the measures required for the radiological protection of people and the environment and, therefore, without situations of undue risk arising.

The activities of the CSN in relation to radioactive facilities include various strategies, among which special mention may be made of the following:

- Promotion of the implementation of a safety culture through contacts with institutions and professional associations, leading to instructions, guidelines, recommendations and protocols for action, through analysis and spreading of operating experiences and through the incorporation of radiological protection teachings in University and vocational training curricula.

- Reinforcement of inspection activities, establishing specific programmes in sectors with the least favourable results and medical diagnosis installations, strengthening indirect control through radiological protection technical Services and Units and supervising the activities of these entities.

- Increased efficiency and effectiveness in standards application through the simplification of the administrative arrangements involved in licensing processes and the drawing up of instructions and guidelines orienting the licensees towards optimum compliance with the conditions required to obtain authorisations and with regard to the suitable application of the safety and radiological protection measures required by the regulations.

- Consolidation and extension of the CSN functions commissioned to the Autonomous Communities, promoting the establishment of new commissioning agreements, extending the scope of those already in place and implementing mechanisms for the coordination and control of commissioned activities.

Article two of the Law by which the CSN was set up empowers the organisation to draw up and approve technical instructions and circulars applicable to radioactive facilities. The Regulation on nuclear and radioactive facilities empowers the CSN to issue Complementary Technical Instructions directly to the holders of authorisations in order to guarantee the maintenance of the safety requirements and conditions applicable to the facilities and ensure optimum compliance with the requirements included in the authorisations. The generic actions performed by the CSN during 2003 in application of these provisions are briefly described below:

- Circular on notification of on-site gammagraphy operations. This refers to industrial radioactive facilities with mobile gammagraphy equipment and establishes that seven days before such equipment is moved to the place of work the CSN should be informed of the date, place and time for the operations to be performed.

- Informative circular on incidents occurring in the field of industrial gammagraphy as a result of disconnection of the source-holder and the remote control unit in TO-660 model equipment. This is aimed at radioactive facilities having mobile gammagraphy equipment and underlines the importance of informing opera-

tors of the need to ensure that the source-holder and remote control are connected correctly.

- Circular on the authorisation of teletherapy facilities equipped with linear accelerators. This refers to radiotherapy and nuclear medicine facilities and includes recommendations to be taken into account when requesting authorisation for the operation of accelerators.

- Circular on the control of radioactive material, aimed at operating radioactive facilities. This circular underlines the need for such installations to ensure the application of safety measures in order to prevent the access of unauthorised personnel to the radioactive material available and to inform of any anomaly detected that might affect the control of radiation sources. This circular originated from the recommendations issued by international organisations in view of the climate of uneasiness generated by the international situation previous to the war in Iraq.

- Technical Instruction on Approval Certificates for type B(U) transport packages. This is aimed at radioactive facilities commercialising or possessing the different models of industrial gammagraphy equipment authorised in Spain. It requires submittal to the CSN of the Approval Certificates in force as a B(U) type package model for such equipment and the revisions thereof that might be issued in the future.

Described below are the main activities undertaken by the CSN during 2003 in relation to the 24,301 radioactive facilities (one first category, 969 second category and 384 third category installations) and 22,947 X-ray facilities for medical diagnosis that figure on the different registers of the Autonomous Communities.

The CSN carries out the control of these facilities both directly and through the Autonomous Communities with which it has function delegation agreements.

During the year 370 reports were issued regarding operating, modification and decommissioning authorisations, 71 of which were by the Autonomous Community of Catalonia, two by the Balearic Islands and 35 by the Basque Country, communities that have assigned to them assessment and control functions, in addition to responsibility for inspection.

The following were especially significant among the control activities undertaken:

- 1,535 inspections, of which 700 were performed by the CSN and 835 by the appropriate services of the Autonomous Communities having inspection assignment agreements in place (319 in Catalonia, 175 in the Autonomous Community of Valencia, 65 in Galicia, 169 in the Basque Country, 73 in Navarra and 34 in the Balearic Islands).

- Review of 1,693 operations reports (653 annual reports on radioactive facilities, 800 annual reports on medical diagnosis X-ray facilities and 240 quarterly reports on commercialisation installations).

Mention should be made of the fact that the annual inspections carried out with respect to hospital radiological protection services include indirect control of the operation of the radioactive and X-ray facilities of the hospital itself and of the X-ray installations of the healthcare centres covered by such services (healthcare centres, specialist centres and other hospitals).

The analysis of the reports issued on the inspections, the annual reports from the facilities, the information on radioactive materials and equip-

ment supplied by the commercialisation installations and the waste management data provided by Enresa led to the issuing of 153 control letters directly by the CSN, 163 by the service responsible for the functions in Catalonia and 107 by the assigned body in the Basque Country, relating to different technical aspects of the licensing and control of the facilities.

Likewise, as a result of the aforementioned assessment and inspection activities, 59 warnings were issued by the CSN, 13 by the Regional Government of Catalonia and 55 by the Basque Country, identifying the deviations encountered and requiring correction by the licensee within two months.

Suspensions of operation were imposed against two industrial radioactive facilities that failed to implement the corrective actions required by the CSN in its warnings.

A proposal was issued regarding the initiation of sanctions proceedings by the competent authority against one industrial radioactive facility.

The causes most frequently leading to proposals for sanctions are the performance of activities requiring authorisation without such authorisation having been given, the operation of facilities by non-licensed personnel and failure to comply with the instructions and requirements imposed.

As regards control, mention should be made also of the attention given to complaints, of which one was received in 2003 in relation to an industrial facility and 12 referring to radiodiagnosis installations.

All of the complaints received by the CSN in relation to the operation of facilities were responded to, as were the cases in which the established dose limits were exceeded. In all these cases inspection visits were made and the CSN contacted the licensees of the installations and established the measures to be taken, where appropriate. In all cases the complaining parties were contacted and informed of the situation detected and the measures adopted.

The CSN received 16 events reports during 2003, although in no case were there significant radiological consequences.

During 2003 the experimental application of the INES (International Nuclear Events Scale) continued for the classification of events at radioactive facilities in Spain. The objective of this scale is to establish a mechanism for prompt and coherent reporting to the public on the impact on safety of events occurring at the facilities.

The CSN is participating with the IAEA's INES Advisory Committee in the drawing up of a *Guideline additional to the INES manual* for radioactive sources and its application to events occurring at radioactive facilities. As a result there have been 21 events at radioactive installations, of which 6 were classified as level one and 15 as level zero.

Industrial facilities

The implementation of an action plan aimed at reducing the dose to the operating personnel of mobile industrial gammagraphy facilities, initiated in mid 2001, has continued during 2002 and 2003. In this respect the following is especially noteworthy:

- A tracking exercise has been carried out with regard to compliance with the CSN's complementary technical instruction requesting the licensees of this type of facilities to incorporate in their operating regulations procedures relating to task planning, the supervision of on-site works and personnel training.

- The campaign initiated during the previous year to reinforce activities for the control of this type of facilities has continued. Such reinforced control is accomplished by increasing the number of inspections of works performed on site and at delegations at which the facilities have operating personnel and equipment, the aim being to check that the procedures mentioned in the previous paragraph are put into practice adequately.

- An analysis has been performed of the operating doses received up to 2002 by professionally exposed workers at the most representative mobile gammagraphy facilities. This analysis shows that the percentage of workers receiving high doses (above 10 mSv/year) has decreased during the last year and that more than 50% of these workers received doses of less than 5 mSv/year. These figures may be interpreted as being the result of the measures adopted in the action plan, although the checking of this trend will need to continue in the future.

- The control of disused radioactive equipment and materials has continued. Maintaining a disused item of equipment in storage for any length of time would be unjustified, since this situation might imply the risk of control of the radioactive material or equipment being lost. For this reason, when equipment in this situation is detected, the CSN requests that the companies in question initiate arrangements for its removal via the regulatory channels and establish close monitoring of the development of such arrangements.

Medical facilities

As a result of the development of new technologies, there were six cyclotrons with operating permits in Spain as of the end of 2003, two in a very advanced state of licensing, with the granting of authorisations scheduled for early 2004, and a further two in the initial stages of licensing. These cyclotrons are used for the production of very short-lived positron-emitting isotopes and subsequent synthesis of the corresponding radiopharmaceutical product, mainly deoxyfluoroglucose labelled with Fluorine-18 (FDG) for use in diagnosis in the field of nuclear medicine by positron emission tomography (PET). Of the two cyclotrons currently in the licensing phase, one will be located at a Hospital belonging to the National Health System. This technique has led to the submittal of a large number of requests for PET facilities.

There has been a significant increase in the number of requests for external radiotherapy facilities, specifically linear accelerators. This has been due to the current trend of improving the medical care provided for cancer patients and to the campaign initiated in 1996 for the progressive withdrawal of obsolete tele-gammatherapy units, which are being replaced with linear accelerators. At present there are 144 linear accelerators for external radiotherapy in Spain, 15 of which were licensed in 2003.

The activities of the Radiological Protection Panel have continued. This Panel, made up of representatives of the Health Departments of the different autonomous communities, the Ministry of Public Health and the CSN, deals with issues of interest to all the participants. During 2003, the Panel has covered a series of areas, particularly significant among which has been the completion of the courses for the auditors of the Health Departments of the autonomous communities, in charge of monitoring compliance with the Royal Decrees that establish quality criteria in Radiodiagnosis, Nuclear Medicine and Radiotherapy.

As indicated in previous reports, one particularly interesting issue has been the setting up in January 2001 of a permanent Forum on radiological protection in the healthcare environment, including the participation of the CSN, the Spanish Ra-

diological Protection Society and the Spanish Health Physics Society. The objective of this Forum is to define a framework for relations and a systematic approach to joint efforts on a series of previously identified issues of common interest. During this year the following working groups have initiated their activities:

- Metabolic therapy, criteria for patient release
- Area dosimetry
- Internal dosimetry

Likewise, the activities of the Forum include the preparation of procedures for the following:

- Management of radioactive liquid effluents at radioactive facilities, in accordance with the document approved by the Forum.
- Management of solid waste materials with radioactive contents generated at radioactive facilities, in accordance with the Order of the Ministry of Economy of 21st May 2003 and the CSN Guide.

X-ray diagnosis facilities

During 2003 some 16,000 annual reports were received from X-ray facilities, including, among other information, data on the quality controls carried out on the equipment by the radiological protection technical units or services or by the companies commercialising such equipment or providing technical assistance.

The year 2003 has seen the completion of the first stage of performance of the pilot X-ray facility inspection programme, the aim of which is to undertake a crossed control between these installations and the Radiological Protection Technical Units (RPTU) providing service to them. The facilities selected for this purpose were general radiodiagnosis installations not attended by a Radiological Protection Service, since these are controlled through the control of such services, and veterinary diagnosis facilities. In relation to this inspections programme and in compliance with Resolution 24 of the Commission of Economy and Finance of theCongress dated 9th October 2002, which states as follows: *The inspection programmes performed at medical radioactive facilities shall include medical X-ray installations, in order to ensure compliance with the inspection programmes,* 171 inspections were carried out at medical diagnosis X-ray facilities during 2003. At present the report on the results is being drawn up, which will be used as a basis for the consolidated inspection programmes for 2004 and subsequent years. These programmes will progressively incorporate dental radiodiagnosis facilities included on the register, such that the *Radiological protection technical units* (RPTU) providing service exclusively to dental installations become a part of such programmes.

1.5. Transport of nuclear and radioactive materials

In accordance with the regulations in force, which require authorisation or notification of transport activities depending on the risk implied by the contents and validation of the waste package model (in keeping with the technical characteristics of the material), in 2003 the CSN reported on eight requests for the validation of overseas certificates and one approval of a package of Spanish origin and six authorisations for transport. Five of these transport operations related to non-irradiated fuel assemblies, of which three were from the Juzbado manufacturing facility to different Spanish or European nuclear power plants, one from Westinghouse Atom AB in Sweden to the Cofrentes nuclear power plant and another from Advanced Nuclear Fuels in Germany to the Trillo plant. A sixth report was issued on uranium oxide transport operations from *British Nuclear Fuels Limited* (BNFL) in Great Britain to the

Juzbado facility. Furthermore, on 14th May 2003 a favourable report was issued on extension of the authorisation for the company Express Truck S.A. in relation to security in the transport of nuclear materials.

Likewise, within the control activities performed in 2003, 45 inspections were performed in relation to transport: 16 by the CSN itself, 28 by the services responsible for these functions in the autonomous communities and one within a framework of collaboration between the CSN and the responsible authority in the Basque Country. This implied a significant increase in the number of inspections performed on this type of activity with respect to 2002.

Also to be underlined is the transport of radioactive wastes by Enresa to its El Cabril disposal facility, with a total of 246 operations for the transport of wastes from nuclear facilities, 44 from radioactive facilities, five as a result of the incident at the Daniel González Riestra installation and five due to the incident at the Acería Compacta in Vizcaya.

The decrease in the number of incidents during the loading and unloading operations performed at airports observed the year before continued in 2003, although there continues to be a large number of transport operations of radioactive materials for medical applications carried out by air. In the two single cases recorded, only external damage to the packaging had occurred, without any material being released and consequently without any radiological risk. It should be pointed out that there has been a switch in air transport from the passenger airlines to freight carriers, as a result of which the number of incidents affecting these operators has increased. The CSN has initiated special tracking of the procedures applied by such entities, especially as regards the implementation of the radiological protection programmes required by the current regulations on the transport of hazardous goods.

1.6. Manufacturing of radioactive equipment and exemptions

As from the entry into force of the new Regulations on nuclear and radioactive facilities, authorisation for manufacturing is required only for equipment containing radioactive material or producing ionising radiations.

During 2003 the CSN has not issued any report relating to the manufacturing of radioactive equipment.

The CSN issued 21 reports: four for the archives, two denying authorisation and 15 including the type approval of radioactive equipment. The trend in recent years, confirmed in 2003, has been for a larger number of requests for approval for X-ray generating apparatus. As regards apparatus containing radioactive material, the radioisotopes involved constitute a low level of risk and are present only in very small quantities.

1.7. Activities and facilities not regulated by nuclear legislation

Transfers to Enresa

The management of radioactive materials lacking authorisation, the result fundamentally of practices carried out prior to the application of nuclear regulations in Spain, is normally accomplished through their removal by Enresa as radioactive wastes.

During 2003 the CSN drew up reports for 42 transfers to Enresa of various materials and radioactive sources. In 18 of these cases, the requesting organisation had no radioactive facilities, the rest being the licensees of such installations. Fourteen reports were prepared by

the responsible authority in Catalonia and two by the corresponding body in the Basque Country.

Radium sources

Another similar case, albeit subject to special regulation, is that of the removal of sources of radium formerly used in radiotherapy. The dispersion of such sources, which were previously freely used, made it advisable to undertake their confiscation at no cost to the users. The Ministry of Economy decreed such seizure, following a report by the CSN, this being carried out by Ciemat. One removal was reported during 2003.

Removal of radioactive material detected in metallic materials

Another case, also subject to special regulation, is that of the removal of radioactive materials detected within the framework of application of the Protocol for collaboration in the radiological surveillance of metallic materials.

On 2nd November 1999, the then Ministry of Industry and Energy, the Ministry of Public Works, the Nuclear Safety Council (CSN), the National Radioactive Waste Management Agency (Enresa), the Union of Iron and Steel Companies (UNESID) and the Spanish Recovery Federation (FER) signed the *Protocol for collaboration in the radiological surveillance of metallic materials,* to which the Mining and Metallurgy Federation of the trade union Comisiones Obreras and the State Federation of Metal, Construction and Other Workers of the union Unión General de Trabajadores later subscribed, in 2000. These were followed in 2002 by the Spanish Association of Aluminium Refiners, the National Union of Copper Industries and the Union of Lead Industries, and in November 2003 by the Spanish Federation of Smelting Associations.

The Protocol is the framework of reference for the radiological surveillance of metals destined for recycling in Spain, and establishes a series of commitments and activities to be performed by each of the signing parties with a view to guaranteeing the radiological surveillance of metallic materials and the management of whatever radioactive materials might be detected or generated as the result of an accident.

As of the end of 2003, the number of facilities attached to the Protocol was 74 (25 in the iron and steel sector, 47 in the recovery industry and 2 in the aluminium smelting sector).

As a result of application of the *Protocol,* 69 cases of radioactivity being detected in metallic materials were reported to the CSN in 2003. The radioactive sources detected, indicators with radioluminescent paint, ion smoke detectors, products containing thorium, parts with depleted uranium and artificially contaminated parts, were transferred to Enresa for management as radioactive wastes. The only exception was one case on which the radioactive source was returned to the country of origin of the manufacturer of the radioactive equipment, the United States.

Acerinox incident

The radiological surveillance programme implemented at the Inert Materials Recovery Centre, located in the marshes of the Marismas de Mendaña, in the province of Huelva, has continued throughout 2003. As regards the final evaluation of the report submitted by Egmasa for the normalisation of the Centre, preparation of the surface and groundwaters flow models remains pending, since the licensee requires radiological surveillance programme data for at least one year to complete this task.

Incident at the metals recovery company Daniel González Riestra, S.L.

On 11th August 2003, the scrap metal fragmentation and recovery company Daniel González Riestra, S.L., located at carretera de Serín s/n in San Andrés de los Tacones (Gijón), notified the

CSN that a truck that was about to leave the facility loaded with *scrap wadding* (light waste from the scrap fragmentation process) had activated the exit gantry monitor radiation alarms.

The facility personnel determined that the cause of the alarm was not any specific part but the overall load, for which reason they shut down the fragmentation plant and immediately notified the CSN. Subsequently, with the help of a radiological protection technical unit, they determined that the fragmentation machine, the fragmented scrap and the light waste from the fragmentation process were contaminated with Cesium-137.

The CSN notified the company of the measures it should implement to prevent the dispersion of radioactive contamination and guarantee suitable radiological protection for people and the environment, and sent two inspectors for a more detailed assessment, accompanied by personnel of Proinsa and Enresa.

In view of the information obtained from the Inspection, the CSN required the facility to maintain the provisional measures for the confinement of the contaminated material and the shutdown of the fragmentation unit, pending the submittal of an action plan for the decontamination and cleaning of the installation.

On 26th August 2003, the company submitted to the Ministry of Economy the action plan for the decontamination and cleaning of the installations. The radiological criteria adopted in preparing this plan were those established for the incidents that had occurred previously at Acerinox and Siderúrgica Sevillana, and three phases were established for performance:

- Cleaning and decontamination programme aimed at releasing the systems required for the start-up of the plant.
- Facility testing and start-up plan.
- Waste segregation, characterisation and removal. Recovery of the areas in which the wastes had been temporarily stored.

On 26th September 2003 the CSN authorised the start-up of the fragmentation machine, following analysis of the report on the cleaning and decontamination of this machine and of the results obtained from the test plan.

The recovery works at the facility concluded in December 2003, on completion of the operations of pressing of the scrap wadding, segregation of the contaminated scrap and treatment of the water and sludges from the fragmentation machine water tank. These tasks were continuously supervised by the CSN.

The event had no radiological consequences for either the workers at the facility or the environment.

During the decontamination and cleaning work, 51,978 kg of radioactive waste were generated, and were sent to the El Cabril disposal facility in a total of five consignments.

Incident at Acería Compacta de Bizkaia, S.A

On 15th September 2003, the integral iron and steel company Acería Compacta de Bizkaia (ACB), located in Sestao (Vizcaya), informed the CSN that a truck exiting the facility loaded with steelworks powder had activated the gantry monitor radiation alarms.

The personnel of the facility isolated the truck and analysed a sample of the powder carried by it, concluding that this contained Cesium-137. Given that this was a possible indication of the melting of a radioactive source, the plant was shut down and the CSN immediately notified.

The CSN notified the company of the measures it should implement to prevent the dispersion of radioactive contamination and guarantee suitable radiological protection for people and the environment, and sent two inspectors for a more detailed assessment, accompanied by personnel of Proinsa and Enresa.

The radiological controls applied by the CSN inspectors identified the presence of radioactivity in one of the smoke powder storage silos, in the smoke extraction line leading to this silo and in the truck that had been about to leave the steelyard. The values measured were lower than those registered in previous events: Acerinox and Siderúrgica Sevillana.

In view of the information obtained by the inspectors, the CSN required that the facility continue with the plant radiological characterisation work and request a plan for the cleaning and recovery of the installation.

On 19th September, ACB submitted the plan for the decontamination and cleaning of its installations to the Ministry of Economy. The radiological criteria adopted in drawing up this plan, which was supervised by the CSN, were identical to those established in the events that had occurred previously at Acerinox and Siderúrgica Sevillana. The cleaning operations focused on two areas of activity:

- Cleaning of the areas of the facility affected by the meltdown of the source of Cesium-137.

- Unloading and characterisation of the smoke powder present in the tank of the truck and subsequent radiological control of the vehicle.

On 20th September, following the emptying of the silo and characterisation of the smoke powder, as well as the emptying of the sleeve filter discharge hoppers presenting the highest dose rates and the cleaning of the combustion chamber of furnace number 2, which is where the source of Cesium-137 had taken place, ACB requested authorisation to start up this furnace.

On 20th September 2003, following an analysis and assessment of the information provided by ACB, the CSN authorised the start-up of furnace number 2 for an initial smelting of its bath load as part of the activities mapped out in the ACB action plan for decontamination of the plant.

On 22nd September, having evaluated the radiometric map of the facility and the results obtained from the samples of powder extracted from the silo following the start-up of furnace number 2, the CSN authorised the return to service of the furnaces for steel production. On 23rd September, ACB started up furnace number 2.

On 26th September, following unloading of the powder from the tank of the truck and analysis of the radiometric data acquired from this tank following its decontamination, the CSN authorised the truck to leave the ACB installations.

The event had no radiological consequences for either the workers at the facility or the environment.

The decontamination and cleaning operations generated 80,240 kg of radioactive waste, which were transported to the El Cabril disposal facility in a total of five operations.

1.8. Service entities

Described below are the main activities performed by the Radiological Protection Services (RPS), the Radiological Protection Technical Units (RPTU), the companies commercialising and providing technical assistance for medical X-ray equipment, the External Personal Dosimetry Service (EPDS) and external companies.

The CSN, which authorises, supervises and controls the entities rendering radiological protection services for the licensees of nuclear and radioactive facilities, carried out the following activities in 2003:

- Three authorisations for the setting up of new radiological protection services (RPS) were requested in 2003, plus one for modification. One modification and one decommissioning operation were reported. The inspections performed amounted to 23: 17 by the CSN, four by the responsible body in Catalonia and two by the corresponding authority in Navarra.

- As regards the radiological protection technical units (RPTU), the main activity is the control applied to these units and through the inspections and periodic reports, since these constitute the basis for part of the controls applied to other facilities, in particular radiodiagnosis installations. 21 inspections were carried out with respect to RPTU's: 17 by the CSN and four by the Regional Government of Catalonia. There were three requests for new RPTU's, one authorisation and six decommissioning operations on facilities that had been inactive for some time.

- There are currently 62 RPS's and 46 RPTU's authorised. Of the latter, 22 render services only for radiodiagnosis installations. A complete list is available on the CSN website.

As from 1992, the sale of and technical assistance for medical X-ray equipment became regulated activities, in accordance with *Royal Decree 1891/1991 on the installation and use of X-ray apparatus for purposes of medical diagnosis.*

The *regulation establishing quality criteria in radiodiagnosis, Royal Decree 1976/1999*, also regulates the activities of these companies as regards the clinical acceptance of X-ray equipment for medical diagnosis and the tests to be performed for this purpose, as well as the implementation of maintenance programmes when the healthcare authorities so determine.

- In 2003 there were 24 requests for authorisation and modification and three for the closure of companies dedicated to the commercialisation of and technical assistance for X-ray equipment for medical diagnosis. Favourable reports were issued authorising 20 new companies, the modification of five existing entries and three closures. As of 31st December 2003, 255 sales and technical assistance companies were duly authorised.

- A Technical Instruction has been issued to all the authorised Sales and Technical Assistance Companies regarding the marking of X-ray equipment for medical diagnosis and the certification of removal of disused equipment.

- A Technical Instruction has been issued regarding requirements for authorisation as a radioactive facility to Sales and Technical Assistance Companies assembling and testing equipment producing ionising radiations for their subsequent sale.

- Warnings have been sent to 83 sales and technical assistance companies that did not submit their annual report for 2002 to the CSN.

As regards the regulatory tracking and control of the personal dosimetry services authorised by the CSN, mention should be made of the following activities carried out in 2003:

- The Economy and Technological Innovation Council of the Autonomous Community of Madrid initiated sanctions proceedings against an external personal dosimetry service (EPDS) in response to a proposal by the CSN,

since the licensee had continued to render such services despite the CSN's having shelved the corresponding request for authorisation as an EPDS.

- Six control inspections were performed at authorised personal dosimetry services and in all cases complementary technical instructions were issued requiring the licensees to improve the operation of such services.

- A specific contract has been signed between the CSN and Ciemat for the performance of a comparative campaign (determination of iodine in the thyroid) between the internal personal dosimetry services of the Spanish nuclear power plants and Tecnatom, dated 16th October 2003.

- The authorisation for the Dositech personal dosimetry service has been temporarily revoked.

- A validation has been performed regarding the operation of the *Internal dose assessment code* (Indac) computer application, implementing the recommendations of ICRP publication 66 and the actions required for their practical application at the internal personal dosimetry services that have led to the modification ex officio of the authorisation for such services.

- Work has continued on the revision of Safety Guide 7.1, *Technical and administrative requirements for personal dosimetry services.* Draft 2 was drawn up following incorporation of the evaluations of comments made by entities external to the Nuclear Safety Council and working in this field.

In relation to the control of external companies, as of 31st December 2003 a total 737 companies were listed on the External Companies Register, the vast majority of which carry out activities in relation to the nuclear power plants.

- With a view to complying with Royal Decree 413/1997 on *The operational protection of off-site workers risking exposure to ionising radiations as a result of interventions in the controlled zone,* this Organisation has carried out seven inspections at the same number of companies in order to verify the authenticity of the data included in the records and the degree of compliance with the obligations established in the aforementioned Decree.

1.9. Personnel licences

In order to guarantee that the personnel of the different facilities are adequately prepared for their respective functions, the CSN grants the necessary licences (for the supervision and operation of nuclear and radioactive facilities) and diplomas (for the heads of radiological protection services) only to candidates passing the necessary examinations. As of 31st December 2003, the number of workers holding such licences or diplomas stood at 7,591. Furthermore, 30,370 workers held the corresponding CSN accreditation for the management of medical radiodiagnosis installations and 42,963 the accreditation required to operate such installations.

The CSN awarded the following licences in 2003:

- At nuclear power plants: seven supervisor licences, four operating licences and one radiological protection service manager diploma plus the extension of 83 operating licences and of 57 supervisor licences.

- At fuel cycle and disposal facilities and installations in the dismantling phase (Juzbado, El Cabril, Ciemat, Vandellós I, Quercus and Elefante plants): six supervisor licences and six

operating licences plus the extension of 41 operating licences and 11 supervisor licences.

- At radioactive facilities: 204 new supervisor licences, 581 operating licences and one radiological protection service manager diploma plus the extension of 4 supervisor and 10 operating licences.

- At medical radiodiagnosis installations: 1,362 management accreditations and 2,317 operating licences for such facilities.

In order to obtain the required licences, candidates have to attend and pass the courses homologated by the CSN.

During the year 2003, three course homologations were proposed for radioactive facilities, this implying 16 combinations of fields of application and level, and a further three were modified. In the field of radiodiagnosis, three homologations were proposed, involving seven combinations, and a further two were modified.

2. Radiological protection of the workers, the public and the environment

2.1. Radiological protection of workers

Article 6 of *Royal Decree 783/01,* which approves the regulations on protection against ionising radiations, includes the principle of optimisation of radiological protection (or Alara principle), which establishes that the doses received by workers professionally exposed to ionising radiations should be kept As Low As Reasonably Achievable, and in all cases below the limits established in the said legislation.

The evaluation of the radiological protection manuals that constitute one of the official operating documents of nuclear facilities, and of those radioactive facilities that, given their radiological relevance are required to have a radiological protection service or technical unit, are, along with the inspections performed by the CSN, the Council's basic tools to guarantee the radiological protection of workers exposed to ionising radiations.

Among the functions assigned to the CSN is the control of radiation doses received by the operating personnel of nuclear and radioactive facilities. As regards this dosimetry surveillance, the legislation in force establishes that individual dosimetry should be undertaken by personnel dosimetry services expressly authorised by the CSN. In order to verify that the operation of such services is in accordance with the conditions established in the corresponding authorisation, the CSN performs periodic inspections, as a result of which the complementary technical instructions appropriate for optimisation of their operations are issued.

In addition, with a frequency of approximately five years and in collaboration with laboratories having a recognised capacity to obtain standardised irradiation fields to the levels of quality determined in the ISO standards, the CSN carries out a comparison campaign in which the authorised external personal dosimetry services are required to read problem dosimeters whose irradiation conditions (dose and energies) are unknown. These campaigns provide the CSN with an objective basis for assessment of the level of reliability of each service and for the application of whatever corrective actions might be appropriate to improve this reliability.

In this context, a specific agreement has been signed in 2003 between the CSN and Ciemat for the performance of an initial comparison exercise on I-131 in the thyroid between the internal personal dosimetry services of the Spanish nuclear power plants and the company Tecnatom.

The *National dosimetry bank* centralises the dosimetry history of the professionally exposed personnel of the Spanish nuclear and radioactive facilities. As of the end of 2003, this bank included approximately 9,875,000 dosimetry measures, corresponding to some 219,500 workers and 36,000 installations.

In addition to the above, the CSN has a further two instruments for the supervision and control of the radiological protection provided for the workers: the personal radiology licence for off-site workers running the risk of exposure to ionising radiations due to their intervening in the controlled zone, and the external companies register, by means of which contractor companies are obliged to submit a declaration of their activities. Throughout 2003 the CSN has distributed a total 2,804 personal radiology licences to workers belonging to 135 companies.

The number of workers professionally exposed to ionising radiations and dosimetrically controlled in Spain in the year 2003 amounted to 89,030[1], these having a collective dose of 37.9 Sv.person and an average individual dose of 1.03 mSv/year. Of these workers, 99.92 % received doses lower than 20 mSv/year and 98.52% doses lower than 5 mSv/year. This distribution underlines the positive trend shown by the country's nuclear and radioactive facilities as regards compliance with the dose limits established in the Regulation on protection against ionising radiations (20 mSv/year averaged over five years).

Presented below are the results of dosimetry control by sectors (figures 2 and 3):

- At the nuclear power plants the CSN controlled a total 7,302 workers, who presented a collective dose of 7.3 Sv.person and an average individual dose of 1.94 mSv/year.

  The collective dose for pressurised water reactors in 2003 continued at a level very similar to that recorded in 2002, this confirming the downward trend observed in recent years. It should be pointed out that in 2003 refuelling outages were carried out at the Ascó I, Almaraz I and II, Trillo, José Cabrera and Vandellós II plants.

  As regards boiling water reactors, refuelling outages were performed at the two plants using this type of technology in 2003, this having meant an increase in collective dose compared to previous years.

  Specifically, the dose experienced during the refuelling of Cofrentes nuclear power plant increased with respect to previous years as a result of the significant increase in radiation levels in the drywell, this having had a negative impact on all the work performed in this zone. The CSN has requested the plant to undertake a root cause analysis, the results of which may lead to preventive and corrective actions for forthcoming cycles.

  Finally, considering the three-yearly average collective doses per reactor per year, the steadily decreasing trend observed in recent years has continued, to a level comparable to that of the results recorded for this type of plants on the international scene (figures 4 and 5).

- At radioactive facilities the CSN controlled 80,702 workers, with a collective dose of 30.3 mSv.person and an average individual dose of 0.93 mSv/year. For 15 workers, ten working in the medical installations sector and five at industrial facilities, the dosimetry reading recorded potentially exceeded the annual dose limit established by the legislation in force. The investigation protocol applicable to such situations is being developed for all these workers.

  – 70,286 (78.95 % of the total number of controlled workers) at medical installations, with a collective dose of 25.3 Sv.person and an average individual dose of 0.92 mSv/year.

  – 5,898 (6.62 % of the total number of controlled workers) at industrial installations, with a collective dose of 3.8 Sv.person and an average individual dose of 1.22 mSv/year.

  – 4,518 (5.07 % of the total number of controlled workers) at research facilities, with a collective dose of 1.2 Sv.person and an average individual dose of 0.60 mSv/year.

[1] Given that the dosimetry data have been obtained from the National Dosimetry Bank, the total number of exposed workers in the country does not coincide with the sum of the workers in each sector reported on, since there may be workers who have worked in different sectors during the year.

Figure 2. Collective dose and number of workers exposed to ionising radiations, by sectors. Year 2003

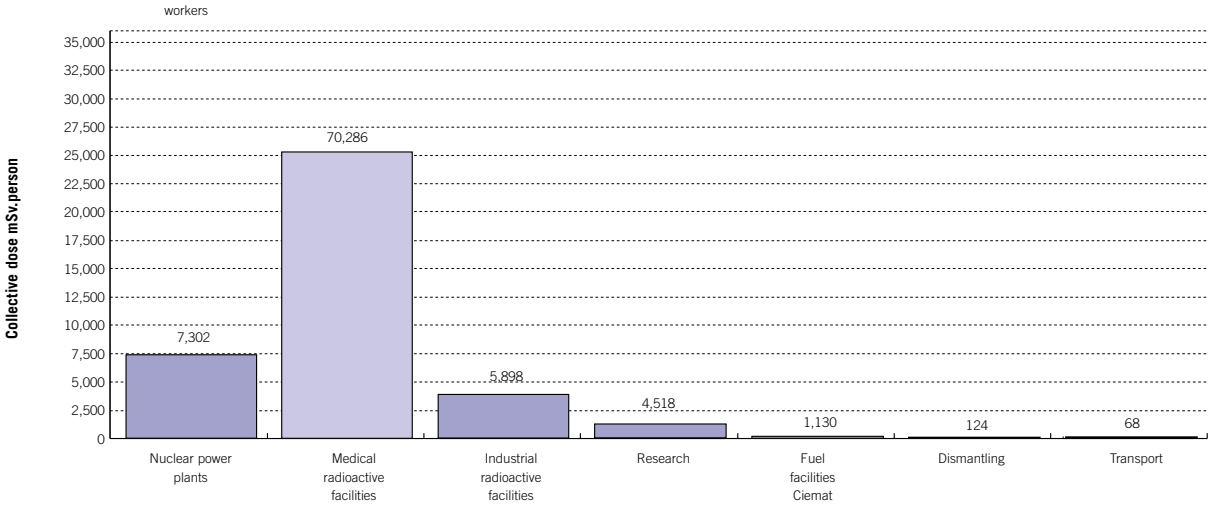
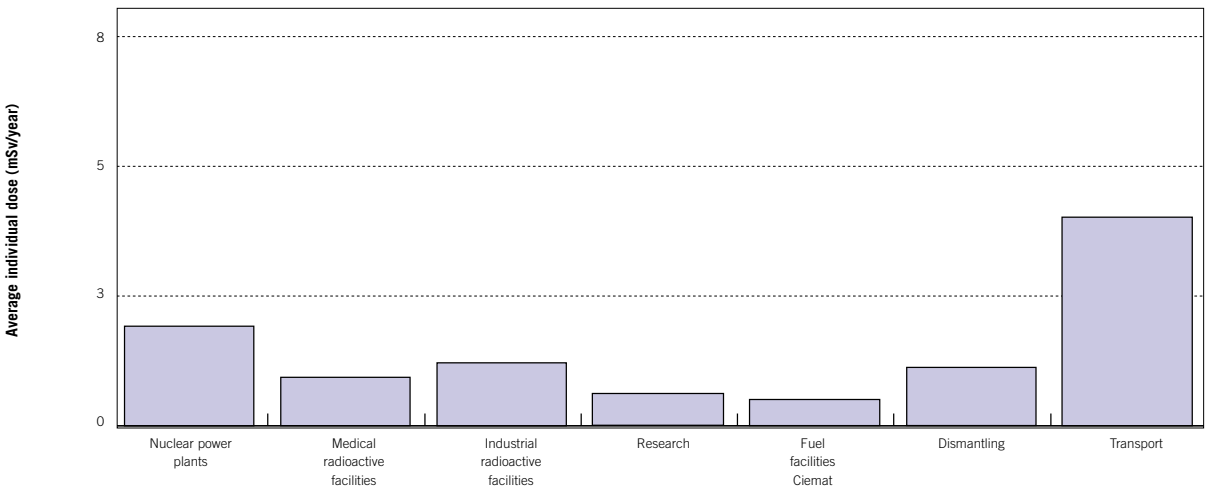


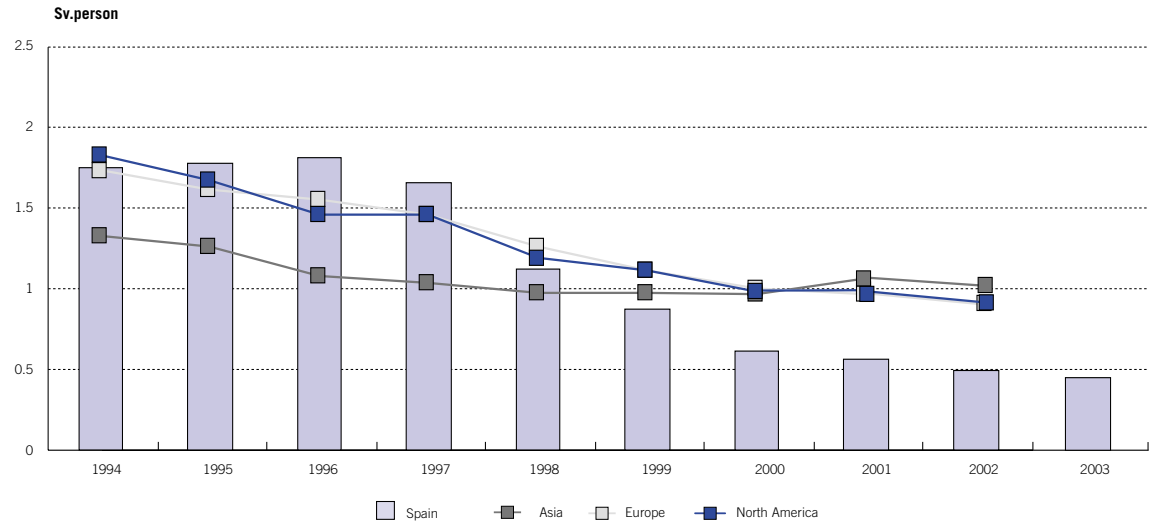
Figure 3. Average individual dose, by sectors. Year 2003



- At facilities in the dismantling and decommissioning phase the CSN controlled a total 124 workers (0.14 % of the total number of controlled workers), with a collective dose of 0.044 Sv.person and an average individual dose of 1.11 mSv/year.

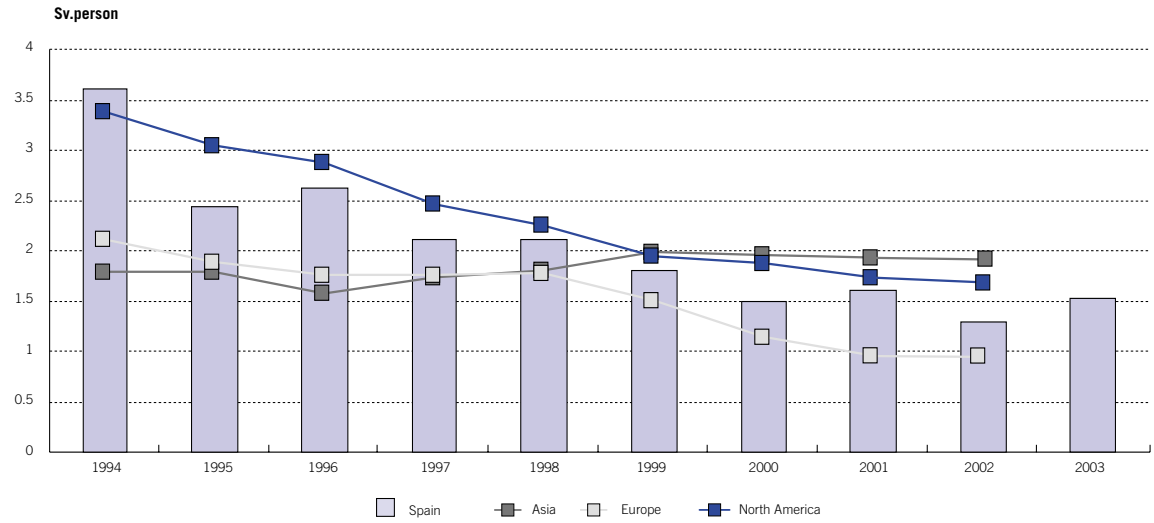
- At fuel cycle and waste disposal facilities and research centres the CSN controlled a total 1,130 workers (1.27 % of the total number of controlled workers), with a collective dose of 0.070 Sv.person and an average individual dose of 0.48 mSv/year.

Figure 4. Average collective dose (Sv.person) for PWR reactors. International comparison



In the production of this figure, the triennial average collective dose for PWR reactors have been considered for each compared region

Figure 5. Average collective dose (Sv.person) for BWR reactors. International comparison



In the production of this figure, the triennial average collective dose for BWR reactors have been considered for each compared region

- In the transport sector the CSN controlled a total 68 workers (0.076 % of the total number of controlled workers), with a collective dose of 0.18 Sv.person and an average individual dose of 4.0 mSv/year. The individual dose is higher than in any of the other sectors indicated.

In this sector the dose concentrates on the transport of radiopharmaceutical materials (for medical centres). Given that these materials are transported in small packages and are loaded and unloaded manually and that there are very few companies carrying out such transport activities, the average individual dose for the sector will nor-

mally be higher than in others, although the collective dose will be comparatively very small.

Finally, it should be pointed out that the CSN continues to apply control measures to the companies undertaking the transport of radiopharmaceutical products. These companies are carrying out dose reduction studies that will lead to the drawing up of working procedures based on Alara criteria, improving worker training and information.

2.2. Environmental radiological surveillance

The CSN controlled the releases from nuclear power plants in order to verify that the activity of the liquid and gaseous radioactive effluents from all the Spanish plants is kept at values far lower than the maximum values corresponding to the limits established in the operating technical specifications of these facilities, the associated doses representing a minor fraction of the authorised limits.

The activity released in the form of both liquid and gaseous effluents was similar to that of other European or North American installations and confirmed the downward trend observed over the last twenty years (figures 6 and 7). Furthermore, the effective doses calculated for the most exposed individual, considering highly conservative hypotheses, have in no case exceeded 4% of the limit of 100 microSievert authorised for radioactive effluents.

The CSN analysed the results for the year 2002 of the environmental radiological surveillance programmes that the licensees of the facilities are obliged to implement, these reflecting values similar to those observed in previous years and far removed from situations of radiological risk. The independent control exercised by the CSN, or assigned to the Autonomous Communities of Catalonia and Valencia provided results equivalent to those submitted by the facilities.

This section reports on the activities performed during 2003 and presents the results of the environmental radiological surveillance programmes

Figure 6. Liquid effluents from PWR nuclear power plants. Total activity save tritium (GBq/GWh)

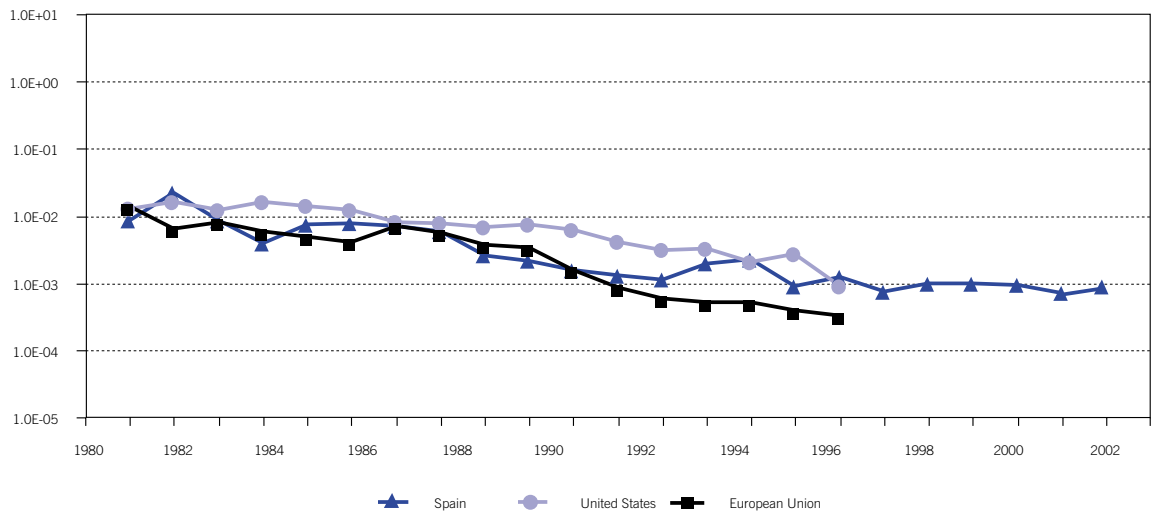
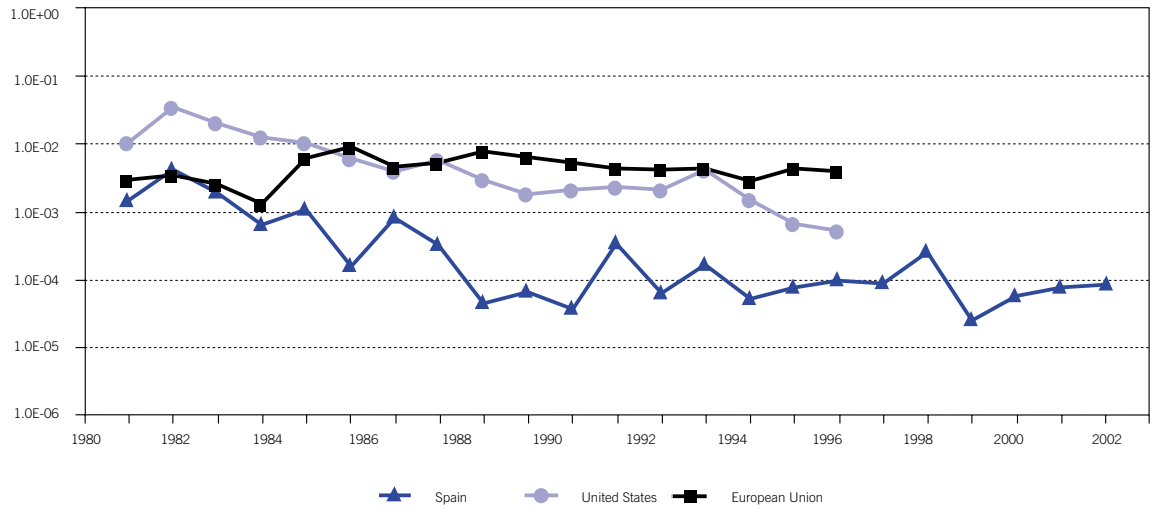


Figure 7. Liquid effluents from BWR nuclear power plants. Total activity save tritium (GBq/GWh)



for 2002. The reason for this lag is that the processing and analysis of the samples does not allow the results of the annual campaigns to become available until the second quarter of the following year.

The CSN also controlled the environmental radiological quality of the entire national territory through its measuring networks. Both the network of automatic stations (NAS) that continuously measures the presence of radiation in the atmosphere and the network of sampling stations (NSS) (spaced and dense networks), made up of a number of laboratories that analyse samples from river and coastal waters, the atmosphere and the terrestrial environment.

Network of sampling stations (NSS)

Atmospheric and terrestrial environment surveillance programme

For the performance of this programme, the CSN has subscribed specific agreements with the laboratories of different universities since 1992. During 2002, 20 laboratories collaborated between the dense and spaced networks, distributed as indicated in figure 8.

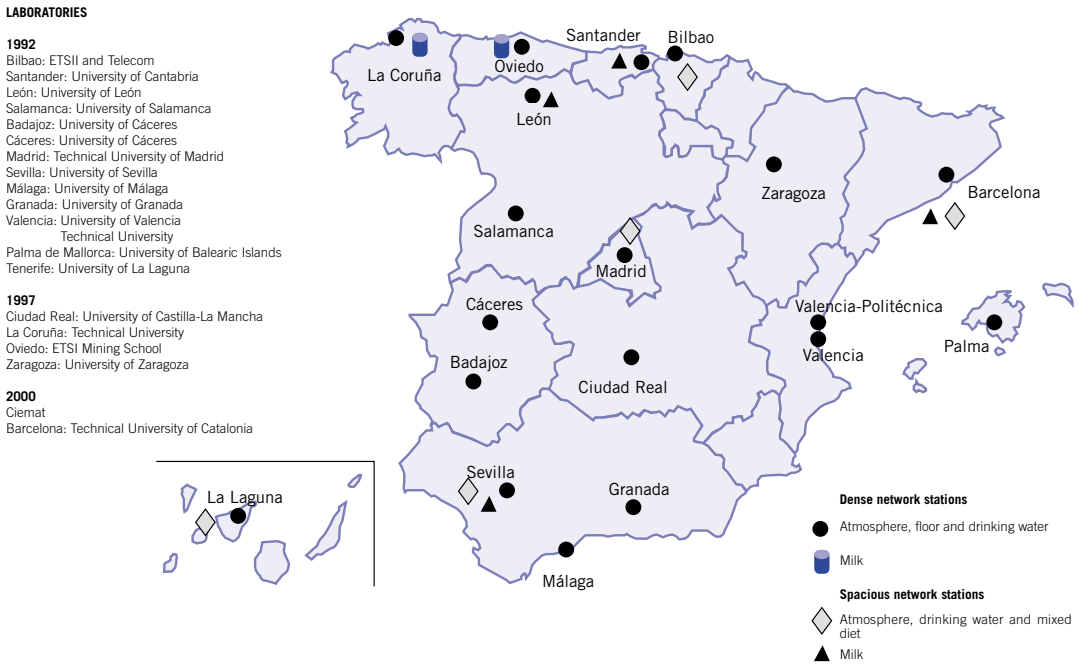
Spanish continental waters radiological surveillance programme

The results of the radiological measurements taken during 2002 from these samples, which were analysed in 2003, confirm the behaviour observed over the years in the different river basins, the most significant events being as follows:

- The values of the indices of total alpha, total beta and other beta values reflect fundamentally the geographical and geological characteristics of the soils over which the different stretches of river flow. In addition, the values may be affected by the impact of urban releases, which increase the content in organic material, and by the existence of agricultural areas on the river banks, with the possibility of fertilisers being entrained in the waters, and occasionally by the detection of the isotopes accompanying such materials, such as Potassium-40 and daughters (decay products) from the Uranium-238 series.

- As in previous years, the highest alpha activity was found in the river Águeda, a tributary of the Douro, as a result of its passing through

Figure 8. CSN's sampling stations network for atmosphere and land: dense and spacious networks



the uranium-bearing land of Saelices el Chico and the Quercus plant works. In the Tagus River the values of this index are also slightly higher at the Aranjuez station and those located downstream, this reflecting the characteristics of the terrain and the agricultural activities referred to above (fertilisers).

- As regards beta activity indices, the sampling-stations located downstream from large population areas registered the highest values, as a result of urban releases. In many of the basins a slight enrichment may be observed between the headwaters and the mouth of the Rivers (Douro, Tagus, Guadalquivir, Segura and Ebro).

- In relation to other isotopes of artificial origin, and has habitually been the case in all the basins, the artificial gamma-emitting radionuclides remained below the corresponding detection limits in 2002.

- In terms of tritium concentration values, the effects of releases (effluent discharges) from the Trillo, José Cabrera and Almaraz nuclear power plants may occasionally be detected in the River Tagus, and in the case of the first of these plants also in the Júcar via the Tagus-Segura transfer channel. The same is true for the Ascó plant and the River Ebro. These values are permanently monitored by the CSN, are insignificant from the radiological point of view and do not represent any risk for the population or the environment, since they are below the acceptable reference values.

The increase observed in the River Tagus at the sampling-station located downstream of the Trillo plant reflect the high activity measured in the samples taken in the months of January and November adjacent to the discharge channel. Coinciding with the release of liquid effluents from the plant, the impact was limited to that particular moment and to that specific

stretch of the river, since no increase was appreciated at the next station downstream or at the same station one month later, where tritium activity above the Lowest Detection Limit (LDL) value was not even detected.

A similar situation was included in the last report 2002, which corresponded to the data for 2001, and it may be indicated that the same occurred in November 2003, in a sample showing an increase in the concentration of tritium at the same station and for the same reasons as indicated above.

Spanish coastal waters radiological surveillance programme

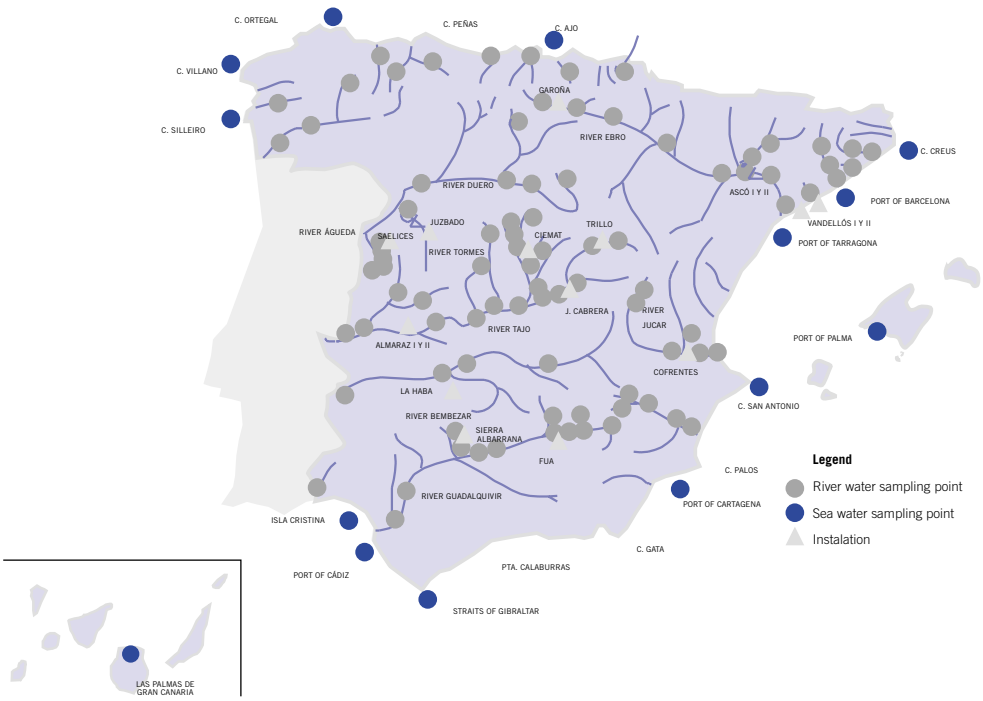
The sampling zones are located at a distance of ten miles from the coast, with the exception of the samples taken at the entrance to harbours. The samples are taken from the surface layer and analyses are performed on total alpha activity, total beta and other beta, as well as gamma spectrometry and tritium.

During the year 2002, samples were taken at the 14 points indicated in figure 9. The values of each analytical determination are fairly homogeneous at all the sampling points and similar to those observed in previous campaigns. The highest variability occurs for tritium, where slightly higher values are obtained at all the points located in the Mediterranean. The activity index for other beta did not reflect any value above the LDL in any sample in 2002. As in previous years, no artificial gamma-emitting isotopes were detected in any of the samples analysed.

Cross-comparison campaigns of analytical results obtained at low activity measuring laboratories

As was pointed out in the previous report, during 2002 a new campaign was initiated in which

Figure 9. CSN´s sampling station network of continental and coastal water



the matrix studied was a marine fauna (fish) reference material containing levels of environmental radioactivity, supplied by the *Marine Environmental Laboratory* of the International Atomic Energy Agency. The radionuclides to be determined were Uranium-234, Uranium-235, Uranium-238, Potassium-40, Lead-210, Radium-226, Cesium-137, Strontium-90, Cobalt-60 and optionally Plutonium-(239+240), Americium-241 and Tecnecium-99. The campaign concluded in 2003 with the meeting held during the month of April at the CSN head offices. The conclusions of this meeting are dealt with in detail in the Annual Report, although overall it may be concluded that the participating laboratories are able to perform radiological determinations on environmental marine fauna samples to a satisfactory level of quality.

Network of automatic measuring stations (NAS)

The network of automatic measuring stations (NAS) comprises 25 such stations. These carry out measurements continuously and the data obtained are received and analysed by the NAS Supervision and Control Centre at the CSN Emergency Room (Salem). During 2003 the network has operated correctly and an automatic continuous gamma spectrometry station has been acquired, installed and started up as a pilot project, for certain stations to be complemented with this type of equipment.

The results of the measurements carried out in 2003 by the network of automatic stations (NAS) were characteristic of the environmental radiological background and indicated the absence of radiological risk for the population and the environment.

Specific surveillance programmes

Special mention should be made of the radiological surveillance that has been carried out in the area of Palomares since the air accident in 1966. Since then a radiological surveillance programme has been carried out in that area without interruption.

The programme is undertaken by Ciemat, which reports to the Nuclear Safety Council. The results of the surveillance programme relating to people indicate that the accident has had no impact on the health of the inhabitants of the Palomares area.

Since that time this area has had little agricultural activity, although recently the owners of local plots have manifested their intention to cultivate them.

In view of the new situation that this implies, in 2001 Ciemat requested that the CSN draw up a report on the measures to be adopted by the competent authority, given the modifications that are taking place in the surrounding area and the possible restrictions on use in the area affected by the accident. The CSN submitted the requested report in February 2002.

In December 2003, Ciemat submitted to the CSN the research plan to be undertaken by the former in the Palomares area, which was favourably evaluated by the Council that same month.

Law 62/2003, of 30th December, on fiscal, administrative and social measures, included an Article 130, *Energy-related and environmental research in relation to radiological surveillance,* which is applicable to the Palomares area.

This article establishes that within six months of the entry into force of the law, the Government will approve an energy-related and environmental research plan to be undertaken by Ciemat, following a report by the CSN, in areas considered to be subject to special environmental radiological surveillance. The actions contemplated in this plan are declared

to be of general interest and imply a declaration of public utility pursuant to articles 9, 10 and 11 of the *Obligatory expropriation* Act of 16th December 1954. Likewise, these activities will imply a declaration of urgency as regards the occupation of the affected assets referred to in article 52 of the aforementioned Obligatory Expropriation Act.

2.3. Protection against natural radiation sources

As regards protection against natural sources of radiation, title VII of the *Regulation on health protection against ionising radiations*, revised in 2001, includes aspects relating to natural radiation. Following the publication of this Regulation the Nuclear Safety Council initiated an action Plan for the enactment of this title.

Within this Plan, and in relation to protection against terrestrial sources of natural radiation, a pilot project was initiated in 2003 covering industries of interest. These studies are being carried out through the establishment of collaboration agreements between the CSN and different universities.

As regards protection against radon gas inside homes, on 5th February 2003 the CSN approved a draft text to be included in the building technical Code being drawn up by the Ministry of Public Works in enactment of the building management Act (L 38/1999 of 5th November). Likewise, during the same year provincial radon risk maps were drawn up, along with protocols on the measurement of radon in soils and homes.

2.4. Radioactive waste

In November 2003 the first meeting for revision of the national reports of the *Joint convention on the safety of spent fuel management and radioactive waste management* took place (this being ratified by the Spanish State on 11th May 1999 and entering into force on 18th June 2001). Particularly significant among the commitments acquired on submittal of the Spanish report are those relating to the development of standards for the management of spent fuel and high level wastes and the commitment to report during the next meeting (2005) on the progress made as regards the decisions to be adopted by the year 2010. The aforementioned report was drawn up jointly with the Directorate General for Energy Policy and Mines, Enresa and the electricity industry.

Management of irradiated fuel and high activity waste

The irradiated fuel generated by the Spanish nuclear power plants is currently being temporarily stored in the plant pools and at the temporary cask storage facility at Trillo, with the exception of that generated up to the year 1983 at the José Cabrera and Santa María de Garoña plants, which was sent to Great Britain for reprocessing, and that generated during the operation of the Vandellós I plant, which was sent to France for reprocessing.

Taking this situation into account, throughout 2003 the CSN has continued to focus its efforts on activities relating to technical progress and to progress in the areas of standards, regulatory issues and associated R&D projects, as well as of communications with the public and the agents involved in decision-making through: 1) tracking of and participation in international developments, 2) tracking of national plans and programmes and 3) the development of in-house technical tools and capacities.

Furthermore, throughout 2003 the CSN has continued its control of the inventory of irradiated fuels and high level wastes and of the temporary storage facilities existing in Spain, the current situation being as summarised below:

As of 31st December 2003, the number of irradiated fuel assemblies in the pools of the operating Spanish nuclear power plants and the dry storage facility at the Trillo plant amounted to 9,444. Of these, 4,372 are from the boiling water (BWR) plants, Santa María de Garoña and Cofrentes, and 5,072 are from the pressurised water plants (PWR), this last figure including also the 126 assemblies corresponding to Trillo nuclear power plant and loaded in the six casks currently in dry storage at the storage facility located at that site.

The pool of the José Cabrera plant will not reach saturation before the definitive shutdown of that plant, scheduled for April 2006, the pool of the Cofrentes plant will foreseeably reach saturation in 2009 and those of Ascó groups I and II in 2013 and 2015, respectively, while the pools of the Santa María de Garoña and Almaraz I and II plants will have sufficient storage capacity to take them to the forecast end of the service lifetime of the plants.

In the case of Trillo nuclear power plant, capacity has been provided in the pool by loading 126 fuel assemblies into the six casks existing as of the end of 2003 in the on-site temporary spent fuel storage facility. These are Ensa-DPT (*Dual Purpose Trillo*) casks and the loading process is subject to compliance with the limits and conditions for their approval and carried out in accordance with the corresponding specifications.

The CSN has carried out inspections on the loading process and in relation to radiological protection aspects of the storage facility.

The facility has a capacity for 80 casks, which is in principle sufficient for the fuel to be generated during operation of the plant, and currently houses six such casks, of which two were loaded and stored in 2002 and four in 2003.

In relation to the control applied by the CSN to temporary irradiated fuel storage facilities, it should be pointed out that in 2003 work continued on the tracking of standards development by international organisations.

As regards the casks used for this storage, they are metallic and of the type known as Ensa-DPT casks, for both the temporary storage and eventual transport of the irradiated fuel from this nuclear power plant. These casks are of American technology and were developed by Enresa and manufactured in Spain, in the Ensa workshops. In March 2003 Enresa submitted the obligatory annual report, which included 37 modifications of a minor nature not requiring the approval of the CSN.

Work has begun in 2003 on the extension of the approval of this cask, such that it be able to house fuel with a higher degree of burnup than that currently authorised. Enresa is expected to request such extension in 2004.

During 2003 the studies and projects included in the CSN's five-year research plan on DGD safety assessment were completed. These included: 1. A comparative study of safety exercises (comparative study of the safety assessments carried out for the different Deep Geological Disposal (DGD) concepts in granite rocks and performed to date by the agencies and regulatory bodies of other countries); 2. Study of application of the concept of recoverability/reversibility to radioactive waste disposal at international level and to the designs included in the national programme; 3. Study of the applicability of natural analogues in assessment of the safety of the DGD of high level wastes and in the communication of such safety to *non-technical* audiences, the so-called *Natural Analogues* project, and finally 4. Study of the state of the art of modelling as applicable to high level waste DGD safety assessment.

Management of low and medium activity waste

During 2003 the CSN controlled the management of radioactive wastes in each of the operational activities involved: handling, treatment, conditioning, temporary storage, transport and definitive disposal.

The following may be singled out from among the actions aimed at controlling the different stages of radioactive waste management and performed by the CSN at the nuclear power plants:

- Control of the systems for treatment and conditioning of the waste generated and of their temporary storage.

  During the licensing process previous to operation, the licensees are required to draw up the corresponding systems control procedures in order to provide a reasonable guarantee that these systems will operate within the conditions established in the authorisations.

  During the operation of the systems the processes are continuously controlled, this allowing the CSN to request the improvements considered to be appropriate in each particular case in view of new technological developments.

- Control and monitoring of the inventory of solid radioactive waste stored at the facilities. This control is accomplished through assessment of the information submitted in the monthly operating reports and through the performance, where appropriate, of complementary inspections.

  One of the activities included in the control of radioactive waste management is the monthly control of waste generation and the updating of the total inventory of waste stored at the producer installations and at the El Cabril waste disposal facility.

- Control of the acceptance processes applied by Enresa to each type package, such that there be a guarantee of compliance with the acceptance criteria for storage at the El Cabril waste disposal facility.

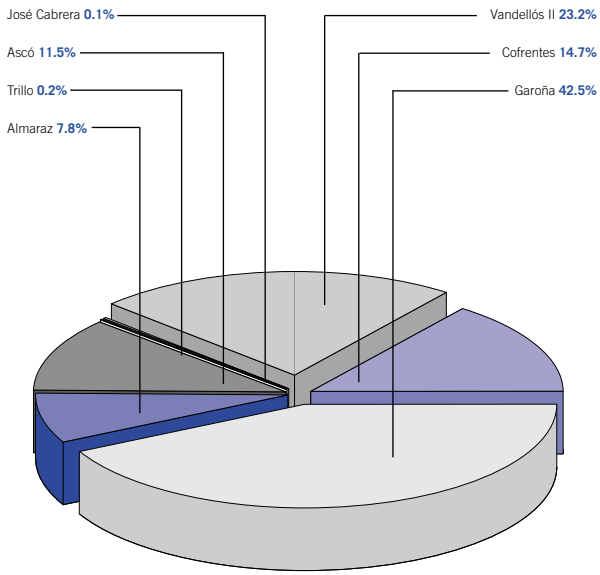
During 2003 7,212 packages of low and intermediate level radioactive waste were received at the El Cabril disposal facility. Of these, 6,961 were from the nuclear power plants (including Vandellós I), 205 from radioactive facilities, one from the incident at the Daniel González Riestra, S.L. scrap, iron and metal fragmentation plant in Gijón and 45 were packages of waste from Belgoprocess (Belgium), pursuant to the waste exchange agreement in place between Ciemat and Belgoprocess. Likewise, 3,129 containment units were received, also containing radioactive wastes, of which 2,951 were from radioactive facilities and 178 from non-regulated installations (98 from Acería Compacta de Vizcaya (ACB) and 80 from the Daniel González Riestra, S.L. scrap, iron and metal fragmentation plant in Gijón).

The estimated activity of the solid low and intermediate level radioactive waste generated in 2003 by the operating nuclear power plants amounted to 52,982.75 GBq, these waste being conditioned in 2,977 packages.

Figure 10 shows the distribution of the activity generated by the radioactive waste conditioned during 2003 by the operating Spanish nuclear power plants.

In 2003 Enresa removed a total 5,186 packages of conditioned radioactive waste from the nuclear power plants, these being transferred to the El Cabril waste disposal facility.

Figure 10. Distribution of activity generated (52,982.75 GBq) of the radioactive waste conditioned during 2003



Management of uranium concentrate plant tailings

In 2003 all production activities ceased at the Quercus plant at Saelices el Chico (Salamanca), as a result of which no new mine tailing beds were managed and no process tailings were produced. The only wastes generated during this phase of definitive shutdown were the neutralising sludges from the treatment and conditioning of the liquid effluents previously stored in the tailings dyke.

Very low activity waste

In 2003 Enresa requested authorisation from the Ministry of Economy for modification of the El Cabril disposal centre nuclear facility, with a view to constructing and operating a complementary installation for the disposal of very low level radioactive waste. Enresa submitted this request on the basis of the provisions of articles 26 and 27 of the *Regulation on nuclear and radioactive facilities,* requesting authorisation for the construction and erection of disposal cells for very low level radioactive waste.

The most important activities performed in relation to very low level radioactive waste were as follows:

- In May 2003 Enusa submitted a new *Project for the definitive restoration of the mining exploitations at Saelices el Chico (Salamanca),* replacing the project submitted in December 2000. This is currently in the evaluation phase.

- Enresa removed 402 radioactive lightening rods, taking the total number removed to date to 21,865, and received 441 new requests for removal. The total number of sources sent to Great Britain amounts to 59,796.

- The CSN received 69 reports on the detection of radioactivity in metallic materials, as a re-

sult of application of the Protocol for collaboration in the radiological surveillance of metallic materials. Most of these metallic parts or sections of piping contaminated with natural radionuclides from non-nuclear industries, radioactive sources of industrial use, indicators with radioluminescent paints and ion smoke detectors. All the radioactive sources detected were transferred to Enresa.

Particularly significant during this year have been the radioactive contamination events that occurred at the Daniel González Riestra installations on 11th August 2003 and at the Acería Compacta de Bizkaia steelyard on 15th September 2003. The application of the Protocol on the radiological surveillance of metallic materials made it possible to lessen the consequences of these incidents by reducing the volume of wastes generated and the time taken to restart the facilities.

Management of declassified materials

By analysing potential radiological risks it is possible to determine which very low activity waste materials may be managed using the conventional methods implemented by society for wastes of a similar nature (declassification) and which others require specific controlled management in keeping with the radiological risk they imply.

Waste materials from nuclear facilities may be managed via conventional routes when they fulfil the following conditions:

- It should be demonstrated that conventional management implies an insignificant radiological risk and that it is justified.
- The management routes selected meet the requirements of the legislation applicable to the management of conventional waste materials.
- Management is undertaken in keeping with an adequate programme for the radiological control of the wastes and is subject to an adequate quality control programme.

In the year 2001 the nuclear power plants, acting through Unesa, requested CSN approval of common projects for the declassification of used activated carbon, spent ion exchange resins and the regeneration of used oils. In June 2002, the Plenary Meeting of the CSN issued its favourable determination regarding the first two of these projects, this being followed in February 2003 by approval for the declassification of the third.

During 2003, the CSN reported favourably to the Directorate General for Energy Policy and Mines regarding the following specific requests by the licensees of nuclear power plants for the declassification of waste streams:

- Declassification of simple geometry metallic scrap and used oils generated during the operation of the José Cabrera nuclear power plant.
- Declassification of activated carbon and ion exchange resins both weakly contaminated during the operation of Trillo nuclear power plant.
- Declassification of activated carbon weakly contaminated during the operation of Almaraz nuclear power plant.

2.5. Radiological emergencies and security

Radiological emergencies

The CSN kept its emergency response system and Emergency room (Salem) continuously operative throughout 2003. The organisation's personnel participated in various initial and on-going training programmes and in the annual emergency drills carried out at all the nuclear power plants and other nuclear facilities.

Likewise, the programmes established for the corrective and preventive maintenance of all the material resources of the emergency room were carried out, with a view to maintaining the capacity of the organisation to respond to such situations.

During the first quarter of the year, all the computer equipment of the Salem was renewed.

Also, a new terminal for the sending of Ecurie messages (Codecs) was installed. This system, developed and maintained by the *Joint Research Centre of the European Commission* at Ispra (Italy), has been specifically prepared for the sending of emergency messages in ECURIE format (European Community Urgent Radiological Information Exchange- Euratom Directive 87/600).

During a nuclear or radiological emergency, when the criteria established for notification and information exchange are met, the CSN is required to report on the situation to the European Commission via its Salem, keeping the latter regularly informed of its development, the protection measures applied or under consideration and the results obtained from radiological surveillance up to the moment of declaration of the end of the emergency.

All information exchange between the Member States and the Commission is carried out by means of a specific software (Codecs). Messages sent via Codecs use a special format known as CIS (Convention Information Structure). This format allows the information to be coded and the size of the messages to be reduced by replacing fixed text with a line number.

During 2003 the CSN has set up a technical group to review the criteria used to date for the planning, organisation and control of the nuclear facilities' site emergency plan drills. The group has completed its analyses and the new criteria, which have been partially applied to the programming and performance of drills in 2003, are expected to be available during the early months of 2004.

Throughout 2003, the CSN has participated, within the framework of the European Union's programme of exercises for maintenance of the system for the rapid exchange of emergency radiological information (Ecurie), in three Ecurie level I international exercises, these having served to evaluate communications between countries that might be affected by a hypothetical accident.

During 2003 the CSN Emergency room (Salem) was activated on two occasions.

The first was on 22nd January 2003 as a result of a fire being declared at a plastics factory belonging to the firm Compañía Valenciana del Extensible, with the loss of sealing and destruction of a 200 mCi gaseous source of Krypton 85. The event had no radiological consequences for either the population or the workers.

The second such activation occurred on 15th March 2003 when the José Cabrera nuclear power plant informed the Salem that it had received a bomb warning. The situation of *Emergency pre-alert due to a contrasted threat to security or attempt at intrusion or sabotage potentially jeopardising the integrity of the security system* was immediately declared. The plant remained in this condition while the appropriate checks were performed. On completion of the inspection rounds and the event having been identified as a false alarm, the plant returned to the normal operating mode at 09:55 hours. At 8:07 hours, and during such time as the *Emergency pre-alert* existed, the emergency room was activated in mode 1, in accordance with the CSN's action plan for radiological emergency situations.

In addition, during 2003 the corresponding subdirectorate of the CSN managed several cases of

radioactive sources or traces of radioactive contamination having been detected in scrap at the entrance to steelyards or metallic waste recovery facilities, following notification by the Salem. In all these cases, the management consisted of the immobilisation of the material, its radiological characterisation by a Radiological protection technical unit (RPTU) duly authorised for this activity and, where appropriate, the immobilisation and removal of the material found by Enresa.

Also, the emergency room received several notifications of the deterioration of radioactive packages due to their being dropped during handling operations at Madrid-Barajas airport. In all these cases the CSN sent an inspector, but in no case had there been a loss of integrity affecting the respective transport containers. The packages were subsequently removed under safe conditions by the personnel of the issuing organisations.

Activities performed by the CSN and the Directorate General for Civil Defence

The activities performed by both organisations are based on the collaboration agreement signed on 3rd May 1999 between the Ministry of the Interior and the CSN in relation to emergencies, this currently being under revision.

The scope of this agreement covers the following:

- Revision of the Basic nuclear emergency plan (Plaben) currently in force.
- Study, setting out and performance of joint initiatives improving technical and human resources and means and increasing the operability of the provincial emergency plans, particularly with the radiological groups.
- Study, setting out and performance of joint initiatives for the shaping and entry into operating status of the so-called central response and support level.
- Activities relating to the training of those participating in the provincial emergency plans and activities relating to information for the population on nuclear emergencies.
- Joint planning of exercises and drills.
- Application of the agreement reached by the Cabinet of Ministers on 1st October 1999 in relation to public information on protection of health and the procedures to be adhered to in the event of a radiological emergency.

As regards the previous points, and within the framework of activities relating to the provincial emergency plans, the mutual collaboration between the Directorate General for Civil Defence, the provincial Civil Defence units and the CSN continued, with the participation of the heads of the radiological groups. For the rest of the points working groups have created and a mixed commission for the tracking of this agreement has been set up.

During 2003, the systematic collaboration between the two organisations within this framework continued, with the joint planning of exercises and drills, the training of participants and public information.

Specifically, and in relation to the revision of the Plaben, as one of the activities required for the transposition of the *EU's Directive 96/29/Euratom,* the year 2003 saw the completion of the review of the proposal, which was approved by the National Civil Defence Commission on 16th December 2003. The Plaben is expected to be approved during 2004.

In this respect, the CSN carried out the activities foreseen in its programme to inform the population on the minimum contents included in annex I of the agreement. To date work has been performed on the design of informative publications

and on extending the contents of the CSN's website: http://www.csn.es.

Parallel to the above, the CSN participated, through the heads of the radiological groups of the provincial nuclear emergency plans, in the public information and participant training sessions scheduled by the provincial Civil Defence units. Likewise, collaboration was initiated with the Ministry of Public Health and Consumption regarding healthcare information for members of the population who might be affected by nuclear or radiological emergencies.

During 2003 CSN activities continued within the framework of the provincial nuclear energy plans, in compliance with the Council's functions and with the objective of improving the operability of these plans at both the basic level of response and at the central or support level.

In response to a request from the Civil Defence authorities, the Nuclear Safety Council has participated in various training sessions for the participants in the different plans, covering radiological protection issues. These sessions have included the participation of both the Heads of the Radiological Groups, technicians belonging to the emergency service and emergency response support service coordinators, contracted by the CSN.

As regards exercises and drills, during 2003 the Directorate General for Civil Defence has not called for the performance of a general simulation, the following exercises having been carried out:

- Exercises on the activation of access controls in the zone of influence of the *Guadalajara emergency plan* (Pengua), on 12th November. The objective of this exercise was to fine tune the procedures of the corresponding *Radiological Group (RG)* and its its interface with the logistics group.
- Exercises on the activation of access controls in the zone of influence of José Cabrera nuclear plant within the Pengua, on 12th November 2003.

No radiological anomaly was recorded during 2003 by the Nuclear Safety Council, on the basis of the measures acquired by the radioactivity alert network (RAN) stations.

Throughout 2003 all the Spanish nuclear facilities kept their respective site emergency plan in force, these having been approved in their day by way of the corresponding Ministerial Resolutions, following evaluation and issuing of the obligatory report by the CSN. During this year, the CSN received requests regarding the proposals for revision of the site emergency plans of the Vandellós II, Santa María de Garoña, Trillo, José Cabrera, Cofrentes, Almaraz and Ascó nuclear power plants, as well as of the Juzbado and Ciemat nuclear facilities.

Both the evaluations of the emergency drills performed and the results of the inspections carried out at the facilities regarding the status of implementation of their respective site emergency plans and emergency drills concluded that the activities performed by the licensees to maintain their capacity and coordination with the national authorities in responding to possible emergencies were adequate. Proposals have been made in relation to the implementation of the new criteria for improvement of the objectives and scope of the emergency drills to be performed at the different nuclear power plants during 2004, as well as to the tracking and assessment of their performance.

Security of nuclear materials and facilities

Royal Decree 158/1995 of 3rd February on the *Security of nuclear materials* establishes that the licensees of nuclear material storage, processing and transport activities require a specific authorisation for the performance of such activities,

which is granted by the Directorate General for Energy Policy and Mines, following reports by the Ministry of the Interior and the Nuclear Safety Council in accordance with their specific internal standards. Such authorisations will be issued for a period of two years, after which the licensees of the specific authorisation must submit a request for the corresponding extension to the Directorate General for Energy Policy and Mines.

Throughout 2003 inspections were performed at all the nuclear power plants and facilities, along with Inspectors from the Central Private Security Unit of the Directorate General of the Police and the Protection and Security Service (SEPROSE) of the Guardia Civil, with the objective of verifying the implementation status of the integrated security model.

This model is based on the joint application of three lines of activity: the internal Security of the facilities, support by the State Security Forces and Corps and a preventive information Plan.

In general, the improvements made in this area by the nuclear power plants are in compliance with the requirements of the integrated security model.

This process has been the basis for the drawing up of the corresponding obligatory report requested from the CSN by the Directorate General for Energy of the Ministry of Economy on awarding of the aforementioned extension of authorisation, which expired in December 2003.

However, the deviations detected have meant the preparation of reports establishing the appropriate corrective actions.

In the wake of the events that occurred on 11th September 2001, and in addition to the activities arising as a result of the aforementioned Royal Decree, the CSN maintained its requirement that the nuclear facilities reinforce their security measures. A coordination Commission has been set up, including representatives of the Secretariat of State for Security (SSS), the Ministry of Economy (Mineco), those responsible for security in the electricity industry and the CSN, the aim being to increase the security levels of such facilities and of nuclear and radiological activities and materials in general, to a level higher than that required by the standards in force and to promote the adaptation of such standards to the current situation.

This Commission has made a series of visits to nuclear power plants with a view to being informed by those responsible for this area of the level of protection available to each facility in relation to this new situation of risk.

Within the framework of the activities of the aforementioned Commission, the *Special intervention unit of the Guardia Civil* has initiated actions aimed at drawing up action plans at nuclear power plant, within its real of competence.

With a view to extending the application of the model to nuclear facilities (Juzbado, Ciemat and El Cabril), throughout 2003 a number of meetings have been held with representatives of these installations, in order to establish the foundations for the model in accordance with their specific levels of risk.

The security criteria document is currently being drawn up, including specification of the systems that the nuclear power plants have installed or are in the process of installing and of the security organisations that are being redefined.

A *Generic security plan* was drawn up with representatives of the electricity industry. This establishes the minimum acceptable content that all the security plans of the nuclear facilities will be required to meet, following approval by the CSN.

In parallel to the above, numerous meetings have been held between representatives of the Secretariat of State for Security (SSS) of the Ministry of the Interior, the Directorate General for Energy Policy and Mines of the Ministry of Economy and the CSN, with the participation of those responsible for security in the electricity industry, in an attempt to reach consensus and sign an agreement establishing the courses of action required to achieve a level of protection for nuclear and radiological facilities, activities and materials proportionate to the level of risk and set up the *working groups* defined by the Commission for performance of such actions.

3. Public information, relations with institutions and research plans

3.1. Public information and communication

Contacts with the media have been continuous throughout the year. The following are among the activities that required a greater flow of information during 2003:

- Fire at a plastics factory in Valencia.
- Exemption for the operating technical specifications granted to Almaraz nuclear power plant.
- Performance of the Spanish plants during the high temperatures experienced during the summer.
- Incidents at iron and steel sector facilities in Gijón and Vizcaya.
- Spent fuel from the Vandellós I nuclear power plant.
- Theft of radioactive equipment in Tarragona.
- Loose part in the reactor of the José Cabrera nuclear power plant.
- Reportable events at nuclear power plants.
- Evacuation drills.
- Radioactive facilities.

The CSN makes important efforts to keep society informed with the rigour and objectiveness that are to be guaranteed by an organisation of a technical nature. During this period, 1,425 telephone calls from the media have been attended to and 67 press releases have been issued. These communications are sent by fax and e-mail to all the press and to the personnel and institutions established in the procedures governing activities. This information is also visibly reflected on the website.

In the area of communications, the number of external queries attended to by e-mail during this last year amounted to 161. With the changes made to the website at the beginning of July and the incorporation of the address comunicaciones@csn.es for contacts, the number of visits has increased by more than 200%.

The subjects that have aroused the greatest interest among the members of the public have been the authorisation of radioactive facilities, operator and supervisor licences, reports on irregularities at facilities and administrative issues.

At the end of the year an analysis was carried out on the consultations made with a view to detecting what issues had generated the greatest interest among the public, and this information was used to make arrangements for the most widely requested to be included on the website in the frequently asked questions section.

During the first week of July the *Basic Course on Radiological Protection* was delivered by the CSN in collaboration with the Ministry of Education, Culture and Sport.

The CSN has a facility dedicated exclusively to providing information for the public, the Information Centre; this is located at CSN headquarters and is based on the use of interactive museum techniques. Since its inauguration in October 1998, and until 31st December 2003, the Information Centre has received 30,966 visits from different school, university, institutional and private groups. During 2003 there were 258 visits to the Centre, with a total 5,355 people. The Centre was visited by representatives of the US

Nuclear Regulatory Commission (NRC), the Ministry of Defence, the Mexican Nuclear Society, the National Safety Commission of Korea, the German Ministry of the Environment and Nuclear Safety (BMU), the International Atomic Energy Agency – IAEA (Austria), CEA, nuclear power plants, the University of Madrid, Enusa and different professional associations.

During 2003 the CSN issued 23 publications (plus 2 updates and one reprint), including Technical Reports, Safety Guides, periodic publications, the CSN journal and various informative and audiovisual publications.

The CSN website, in operation since April 1997, has now become consolidated as a public information service. The number of visits to the institutional site during the year amounted to 50,892.

Also included among the activities carried out by the CSN are conferences relating in general to science and technology and, in particular, to ionising radiations and their regulation, these constituting an important contribution on current affairs in these areas.

The following conferences and working sessions were held in 2003:

The *Behaviour of structural materials* and their influence on *Nuclear power plant lifetime management* and *The Principle of precaution: legal and social aspects*.

3.2. Institutional relations

The CSN's institutional relations during 2003 are reflected below.

Relations with Parliament

During the 7th Legislature, constituted following the elections held in March 2000, and throughout 2003, issues relating to the Nuclear Safety Council have been dealt with by the Economy and Finance Commission, within whose framework is included the specific panel in charge of studying the reports submitted to the Houses by the CSN. This has been so since the disappearance of the Industry and Energy Commission, which traditionally dealt with energy issues and, consequently, matters relating to the CSN.

The annual report of the CSN, containing information on the activities carried out during the year 2002, was submitted to Congress and the Senate on 26th June 2003.

The appearances before the Parliament in 2003 were the following:

- On 25th November 2003 the Lady President of the Nuclear Safety Council appeared before Congress (Economy and Finance Commission) to inform on the annual report of this Organisation for the year 2002.

- On 23rd October 2003 the following members of the CSN appeared before the special Panel in charge of studying the *Annual Report* on the activities of the CSN during 2002: the Secretary General, the Technical Directors of Nuclear Safety and Radiological Protection and the Deputy Directors General of Nuclear Facilities, Operational Radiological Protection and Environmental Radiological Protection.

- There has been no request for the President or other members of the CSN to appear before the Senate during 2003.

The 14 reports requested by Resolutions of the Economy and Finance Commission on 9th October 2002, corresponding to the Annual Report for 2001, were submitted to Congress. A set of five responses of different nature was initiated in

relation to the Resolutions of the Economy and Finance Commission of 17th December 2003.

Three periodic reports arising as a result of the fourth Resolution of the Commission for Industry, Energy and Tourism of 31st March 1998, and corresponding to the CSN's Annual Report for 1996, were submitted. A catalogue of the most representative reports on nuclear power plant operation is submitted every two months in response to this Resolution. Finally, two technical reports were submitted, within the framework of the obligatory annual reports, in compliance with Resolutions 23 and 24 of the Economy and Finance Commission of 9th October 2002 and in relation to the Annual Report of the CSN for the year 2001.

Technical reports were also drawn up in response to the written parliamentary questions presented in relation to the CSN by different parliamentary groups belonging to both Houses. The number of requests made of the Government in this respect amounted to 82, this corresponding to a much larger number of reports since, in most cases, the requests encompassed two, three or more matters and questions. Six parliamentary questions did not count since they were withdrawn by the parliamentary group that had issued them.

In percentage terms, the parliamentary questions relating to nuclear power plants amount to 84.1% of the total. The parliamentary questions relating to radioactive facilities constitute 6.1% of the total and those relating to fuel cycle installations 9.8%.

Finally, mention should be made of the one parliamentary question asked by the Senate.

Relations with the Central Administration

A large number of the functions assigned to the CSN are carried out in coordination and collaboration with the ministries.

Ministry of Economy

The annual meeting held at the Ministry of Economy took place on 20th February 2003, attended by representatives of the Directorate General for Energy Policy and Mines, the CSN, Enresa and all the autonomous communities having functions and services transferred to them in relation to 2nd and 3rd category radioactive facilities. Among other issues, the meeting dealt with questions relating to the application of the regulation on nuclear and radioactive facilities, application of Euratom regulation 1493/1993 on the transfer of radioactive sources between Member States, the on-line communication of records of the Ministry of Economy and the Autonomous Communities and the applications of R.D. 1891/91 on the installation and use of X-ray apparatus for purposes of medical diagnosis.

Ministry of the Interior

The following were particularly significant among the activities carried out:

- There was a meeting of the mixed commission for tracking of the agreement between the Ministry and the CSN on emergency response issues, this being held at the Directorate General for Civil Defence on 6th February 2003.

- The Ministry of the Interior (MIR), the CSN, Ciemat, Enresa and the Military College for nuclear, biological, chemical and radioactive Defence (NBQR) have implemented training initiatives for personnel (radiological, medical and logistical) intervening in the different emergency plans.

- An action plan aimed at improving the security of nuclear and radioactive facilities, activities and materials continues in collaboration with the Secretariat of State for Security of the MIR, the Sub-Directorate General for Nuclear Energy of the Ministry of Economy and the licensees of nuclear facilities. This has led to the

National nuclear and radioactive facilities, activities and materials security system.

- Work has continued in different areas relating to public information on the health protection measures and procedures to be adhered to in the event of a radiological emergency.

- The Council has participated in training programmes for those involved in emergency response and in public information programmes.

Ministry of Education, Culture and Sport

There is a collaboration agreement between the Council and the Ministry of Education and Culture that has been extended during 2003. As a result of this framework agreement, from 30th June to 4th July 2003 the Basic course on radiological protection was prepared and delivered. This course is designed for secondary school teachers specialising in mathematics, physics and chemistry and natural history.

Ministry of Public Health and Consumption

During 2003 the work of the radiological protection Panel set up in 1997 within the Inter-territorial Council of the National Health System in response to a proposal by the Nuclear Safety Council has continued. This panel includes representatives of the Ministry of Public Health and Consumption, Insalud, the Carlos III Healthcare Institute, the CSN and the autonomous communities having areas of competence transferred to them in relation to healthcare. Work has continued also in the areas in which the CSN collaborates with the Directorate General for Public Health of this Ministry, in aspects which the Agreement of the Cabinet of Ministers of 1st October 1999 established as involving the national and autonomous community health authorities and the CSN in relation to public information. In this respect, the two courses of action initiated have continued, one relating to coordination with the Ministry and the autonomous communities and the other to the information to be provided to the representatives of these communities via the panel on radiological protection.

Ministry of Defence

During 2003, the CSN has continued to collaborate with the Ministry of Defence in relation to the training of the NBQR groups.

Office of the President of the Government. Crisis Cabinet

In April 2003 an informative update meeting was held at the CSN emergency room (Salem) on resources, activities, etc.

Other ministerial departments

The CSN carried out its technical assistance and advisory services function for other ministries on all those occasions on which such assistance was requested.

Likewise, the CSN submitted the information requested by the Ministry of Labour and Social Affairs, in relation to the CSN's decision to set up a consultation committee for safety, hygiene and healthcare at work.

Relations with the Autonomous Community Administrations

The CSN maintains institutional relations with the Autonomous Community Administrations via two different routes: general relations and the assignment of functions.

Relations with the autonomous communities

Apart from issuing reports on radioactive facilities for the autonomous communities, the CSN collaborates and provides technical assistance on matters within its realm of competence to the Administration and the legislative assemblies of these communities.

In the wake of the meeting held on 25th April 2002, in relation to the application of Title VII of

the *Regulation on health protection against ionising radiations*, the CSN has continued to foster its relations with the different autonomous communities, in order to provide insight into the different organisations having responsibilities in the application of the said Title, the CSN's activities and the working programmes in place.

In view of the fact that the Autonomous Community of Madrid has a far-reaching programme of activities in place with highly technical industries and that the relations between the two organisations are considerable, work is under way on the preparation of a *framework agreement* for collaboration in technology transfer, training, information and education in the area of nuclear safety and radiological protection and for collaboration in R&D&I programmes.

As regards the requests for information issued by the Autonomous Communities, mention should be made of those from the Regional Governments of Navarra and Castilla y León.

Among its other functions, the CSN is empowered, as recognised in its *Law of constitution*, to assign to the autonomous communities the exercising of the functions attributed to it.

In the coming months, the entry into force of the assignment agreement with the Autonomous Community of the Canary Islands is expected to be signed, with which the CSN will have assignment agreements in force with the following autonomous communities: Balearic Islands, Canary Islands, Catalonia, Galicia, Navarra, Valencia and the Basque Country.

During 2003, and in development of the approved criteria, meetings were held with the different mixed commissions for the tracking of the assignment agreements signed with the Autonomous Communities of the Balearic Islands, the Basque Country, Catalonia, Valencia, Navarra and Galicia.

In all these cases, the performance of the activities was seen to have advanced to a high degree and the assignment of functions to be generally operating well. An additional contribution made by the autonomous communities having responsibilities in this area, agreement on which has been initiated during 2003, is the inclusion in the corresponding assignment agreements of the participation of autonomous community inspectors in the emergency plans. Also in this area, the annual meeting with the inspectors of the different autonomous communities having assignment agreements was held on 22nd October 2003.

Relations with the Local Administrations

The municipal authorities located in areas surrounding nuclear facilities and the organisation that encompasses such organisations: the Association of Municipal Authorities in nuclear power plant areas (AMAC), also constitute a group with which institutional relations are maintained and that receives the periodic publications of the CSN and other documentation and information of interest.

Different meetings have been held with AMAC to deal with the contents of a framework agreement and a *Specific agreement* for information and the education of the members of the public and socio-economic sectors in the areas surrounding the Spanish nuclear power plants. This framework agreement for collaboration was signed on 22nd September 2003, and the Specific agreement will enter into force on 12th February 2004.

As regards the request for information emanating from the town councils, those coming from the Town Council of Almaraz: Request for information on cases of risk at the Almaraz nuclear power plant in the last four years, and from the City Council of Madrid: Reply to the letter sent by the

coordinating committee of those affected by the Integrated Plan for Improvement of Ciemat Installations, warrant special mention.

Relations with other Institutional Organisations

As regards the requests for information from the Ombudsman, mention should be made of the request issued as a result of a complaint filed by a private individual regarding the situation of the Palomares area following the accident that occurred in 1966.

Relations with Companies and other Organisations

The CSN maintains institutional relations in various areas, the most significant being those relating to R&D with public and private entities in their respective realms of competence, such as Unesa, Ciemat, Enresa, Enusa, Cedex, etc.

Another noteworthy activity has been that relating to the updatings of the agreements between the CSN and Cedex for technical assistance to the former in the plans for environmental radiological surveillance in aquatic media, and between the CSN and Ciemat for the performance of environmental radiological measurements in emergency situations, by means of the radiological control mobile unit and fixed laboratories.

Relations with Universities

Specific agreements have been arranged and signed with the Polytechnic University of Catalonia, for the promotion of training programmes in the area of nuclear engineering, with the Polytechnic University of Madrid, for the preparation of computer supported and internet informative materials on nuclear safety and radiological protection, and with the Universities of Granada, Salamanca and Castilla-La Mancha in relation to environmental radiological surveillance programmes in the areas surrounding facilities.

The CSN has participated in a seminar on communications in relation to nuclear safety and radiological protection for journalists and students at the European University of Madrid.

Finally, a series of specific agreements have been signed with the Polytechnic University of Madrid on methodologies, calculation tools and phenomena associated with the application of *Level 2 PSA's*, and another with the Polytechnic University of Catalonia on an environmental radiological surveillance programme (Sampling Stations Network).

Non-Governmental, Professional and Trade Union Organisations

During 2003 communications and reports were sent to Greenpeace and other environmentalist associations on, for example, the *Request for temporary exemption from compliance with the operating technical specifications of Almaraz nuclear power plant* and on the *need for new epidemiological studies in areas surrounding nuclear facilities*. Reports were also submitted in response to a request from the state coordinator of nuclear power plant workers' committees, with which a meeting was held on 27th March 2003 to deal with issues relating to personnel training, sub-contracting and fire-fighting services, among other matters.

Specifically, the CSN has participated in the two annual meetings of the Radiological Protection Forum with the Spanish Association for Radiological Protection and the Spanish Medical Physics Society. As a result of this activity a Specific Agreement has been prepared for collaboration between the CSN and the aforementioned Spanish Association for Radiological Protection and Spanish Medical Physics Society for training and basic information for various groups on the use of ionising radiations in the medical environment.

On 9th December 2003, a framework agreement was signed with the Spanish Professional Association of Physicists for the dissemination of information on Radiophysics, Radiological Protection, Radioactive Waste and Nuclear Energy, and on 29th October 2003 a Specific Agreement was signed with the Spanish Association of Radiotherapy and Oncology (AERO), with a view to informing the public on the use of ionising radiations for therapeutic purposes.

Management of subsidies

With a view to providing incentives for and promoting the performance of activities, the CSN publishes a call for requests for subsidies aimed at non-profit making entities and associations for the performance of programmes in the area of nuclear safety and radiological protection.

The call in force throughout 2003 was published in the Official State Gazette number 9 of 10th January 2003, with a budget of 160,750 euros.

3.3. International relations

The international projection of the CSN rests on multilateral relations with international organisations and institutions and on bilateral relations with counterpart institutions in other countries.

Within the framework of bilateral relations, during 2003 the CSN has strengthened ties fundamentally with the United States of America and France, with high level bilateral meetings, the creation of joint working groups and the exchange of technical personnel. The CSN has also maintained active relations with all the member countries, with the new states of the European Union and with Argentina, Brazil, Mexico, Cuba, Morocco and South Korea.

The CSN has participated in the governing bodies and institutional and working groups of international organisations responsible for matters relating to the nuclear and radiological safety and security of nuclear and radiological facilities and materials: the European Union, the United Nations International Atomic Energy Agency (IAEA) and the Nuclear Energy Agency of the Organisation for Economic Cooperation and Development (OECD/NEA), and has also participated actively, through its presidency, in international regulatory associations such as INRA (International Regulatory Association), WENRA (Western European Nuclear Regulatory Association) and the Forum of South American Regulators.

Multilateral relations

The participation of the CSN in the international working groups of the United Nations International Atomic Energy Agency (IAEA), the European Union and the Nuclear Energy Agency of the Organisation for Economic Cooperation and Development (OECD/NEA) is a top priority institutional activity. The issues dealt with during these multilateral meetings have paved the way for insight, information exchange and the adoption of common and harmonised strategic decisions improving aspects of nuclear safety, radiological protection and waste management in the member countries.

Worthy of special mention are the tasks in support of proposals for EU directives on high level sealed sources and the harmonisation of EU criteria regarding nuclear safety and wastes of the European Union Council's Atomic Affairs Group (AAG); the drawing up of the First National Report and examination meeting in relation to the *Joint Convention on the Safety of Spent Fuel Management and on the Radioactive Waste Management*, and the presidency of group 5, evaluating countries such as Finland, Canada, the Republic of Korea, Poland, Austria and Hungary.

A more detailed discussion is presented below:

- As regards the *Joint Convention on the Safety of Spent Fuel Management and on the Radioactive*

Waste Management, the first national report was submitted, drawn up by the following organisations and entities: the CSN, Enresa, Unesa and Ministry of Economy.. The first examination meeting was held in Vienna on 3rd to 14th November 2003.

The most relevant aspects that drew the attention of the representatives of the Contracting Parties present during the submittal of the National Report, and which are included in the Findings of the Reporter are, among others, those relating to the decision to postpone decision-making regarding the definitive management of spent fuel and high level wastes until the year 2010, the national processes and developments for decision-making, development of the legislative framework on the management of high level wastes and long-term institutional control and, finally, the security of spent fuel and strategies for its intermediate storage at a centralised temporary storage facility or at temporary storage facilities located on the sites of the nuclear power plants.

- The *Convention on the Security of Nuclear Materials* is currently in a process of revision, in which the CSN is participating. In March 2003 the CSN was part of the delegation chosen for the work of the open-ended *Legal and technical experts group* in charge of drawing up a project for amendment of the Convention. The proposal for the revised convention includes matters such as the protection of nuclear material in use, storage and national and international transport, the protection of nuclear facilities, the protection of nuclear materials and facilities against sabotage and the protection of classified information. It also includes national responsibility for security, the establishment of fundamental objectives and principles in relation to security and new definitions of nuclear materials, sabotage and nuclear facilities.

- The objective of the *Oslo Paris Convention* (OSPAR) is the protection of the marine environment in the North East Atlantic zone against the effects of human activities, and includes a number of committees, among them the Radioactive Substances Committee (RSC), in which the CSN participates.

The CSN has drawn up the reports submitted by Spain with the data for 2002 on releases from the Spanish nuclear facilities, these having been prepared and submitted to the Ministry of the Environment (MMA) by the CSN since 1990.

IAEA

As regards the activities of the International Atomic Energy Agency (IAEA), it should be pointed out that the CSN contributed 323,230 euros in 2003 (this implying an increase of almost 22% over the previous year) to the total amount provided by the Spanish State, which represents 2.4% of the IAEA's budget.

The contribution made to this Organisation by the CSN in terms of technical participation is high. The technical staff of the CSN closely monitors the working programme of the IAEA and actively participates in it. During 2003 the staff participated in more than 40 meetings of the different technical and advisory committees, in working groups and in training courses, attended three meetings of the governors and the 47th General Conference and managed scientific visits from Turkey and Indonesia in relation to operational radiological protection and quality, respectively.

The General Conference is the governing body of the IAEA. It meets once a year to map out the general courses of action. The forty-seventh session of the IAEA General Conference took place in Vienna in mid September 2003 and included the participation of delegates from the member countries, among them Spain.

The IAEA *Commission on Safety Standards* (CSS) manages the different working groups relating to standards on nuclear safety, radiological protection, waste management and the transport of radioactive materials.

The CSN participates actively in the different working groups: the Nuclear Safety Standards Committee (NUSSC); the Radiological Protection Standards Committee (RASSC); the Transport Safety Standards Committee (TRANSSC) and the Waste Management Safety Standards Committee (WASSC).

In November 2003 there was a tracking evaluation visit to the Santa María de Garoña nuclear power plant by the *Operational Safety Review Team* (OSART), whose work at the facility began in 2002, this producing excellent results.

The objective of the OSART missions is to exhaustively evaluate operating safety, comparing the operation of different plant operating programmes and procedures with the best safety practices adopted at other nuclear power plants across the world.

In 2003 the Council has continued to participate in the tracking of work performed in relation to the design and implementation of a nuclear safety insight network within the framework of the assistance given to the countries of Asia and the Far East, and scholars and scientific visits were received from other countries such as Brazil, Turkey and Indonesia.

Technical Committees

Multilateral relations within the European Union are one of the CSN's important activities. A particularly significant area as regards this cooperation is the assistance provided to the New Independent States (former USSR countries) through TACIS funds, coordinated during the meetings of the Regulatory Assistance Management Group (RAMG) and the European Coordination Group (CONCERT).

In 2003 the nuclear safety department continued with its objectives of responding to the technical and scientific needs of the European Union, of maintaining a high level of European capacity and of contributing to the creation of the aforementioned European research framework. The CSN staff attended the meetings of the atomic affairs group, which dealt with the recently published directive on high level sealed sources and with the directives of the nuclear package on basic standards and general principles regarding nuclear safety and the management of spent fuel and radioactive wastes.

During 2003 the EU Commission continued its efforts to ensure a common approach to nuclear safety, including common standards, criteria and practices for agreement with the states on the final contents of the corresponding Directives on Nuclear Safety and Wastes. The CSN undertook the technical review of the proposals to be submitted to the *Atomic affairs group* (AAG) via the *Permanent representation*, coordinating its work with comments from other institutions, especially in relation to the directive on nuclear safety.

In relation to the European Coordination Group (CONCERT), it should be pointed out that the meeting held in May 2003 included discussion of the problems arising during the dismantling of nuclear facilities and the management of the wastes generated.

The Brussels meeting of the Regulatory Assistance Management Group (RAMG) included a review of the actions already performed and coordinated for the candidate countries by the DG-extension, and study of the future activities of the group within the Phare project for assistance to those countries that are candidates for membership. In 2003 the CSN approved its participation in the 5th project for Assistance to the Regulatory Authority of Ukraine.

The CSN also participates in the Nuclear Safety Authorities Advisory Group (NRWG) of the Directorate General for energy and transport DG-TREN, which was set up by a Resolution of the Council on 22nd July 1975 and whose scope covers nuclear power plants and all types of nuclear facilities, as well as the criteria and methods applicable to advanced reactors.

NEA/OECD

Through the CSN, Spain hosted the *Second Forum* on future radiological protection policy, organised by OECD/NEA in collaboration with the International Commission on Radiological Protection (ICRP), which took place in Lanzarote from 2nd to 4th April 2003. The CSN participated actively in both the organising committee and the technical sessions of the Forum, which was attended by 97 specialists from 20 countries who debated the implications that the forthcoming recommendations of the ICRP, expected in 2005, will have for regulators, operators, workers and the general public.

The CSN continued to participate fully in the programmes and activities of the NEA through the Committee for the Safety of Nuclear Installations (CSNI), the Committee for Nuclear Regulatory Activities (CNRA), the Radioactive Waste Management Committee (RWMC), the Committee for Radiological Protection and Public Health (CRPPH), the Nuclear Science Committee (NSC) and the Nuclear Law Committee (NLC).

Bilateral relations

The bilateral relations maintained by the CSN through agreements or protocols with its overseas counterparts facilitate the exchange of practices and information with regulatory authorities having similar functional responsibilities.

The CSN has agreements or protocols in place with organisations carrying out similar functions in 19 countries. With four of these countries, USA, Sweden, France and Great Britain, there are specific agreements. These agreements constitute a particularly useful practice for the sharing of information and regulatory practices, and serve as a framework for permanent and enriching cooperation in the exchange of know-how and experiences in the fields of nuclear safety, radiological protection and waste management. This year special emphasis has been given to the agreements with Sweden and the United States, since of the entire international community these are the two countries whose practices are most similar to those adopted in Spain and, in many cases, they are at the forefront as regards regulatory efficiency.

The year 2003 has seen the activation of relations with certain regulatory organisations, such as the Korean KINS.

The most relevant aspects are dealt with below.

The agreement with Germany allows for the frequent exchange of information between the CSN and the German Ministry of the Environment (BMU), in particular on operating incidents and the new standard issued, which is of great importance for the regulatory control of Trillo nuclear power plant.

In 2003 the German Ministry of the Environment, which is carrying out a study on the independence of the organisation, sent a group of legal experts to the CSN to discuss the working practices and the standard of the regulatory authority that guarantees the principle of independence. Likewise, another delegation of the BMU visited the Nuclear Safety Council in November, meeting with several members of the technical staff to discuss regulatory practices.

In response to an initiative by the Argentinean Regulatory Authority, a visit was made during which technical meetings were held and radioactive and nuclear facilities were visited. Areas of common interest were identified.

Arrangements were made with the Republic of Cuba for the provision of radiological protection material to the Regulatory Authority, and activities have been planned for the setting up of this equipment.

Within the framework of a programme designed to strengthen relations with the Republic of Slovakia, a visit to Spain was organised for high-ranking representatives of the Ministry of Energy Policy and of the state electricity utility. The main objective of this visit was to achieve the support of the Slovakian Government for Spain to be appointed leader of work relating to the dismantling of the Bohunice nuclear power plant.

The agreement with the United States of America is one of the most useful, since many of the Spanish nuclear power plants use technology developed in the US and relationships are particularly fluid. Arrangements have been made for an institutional visit to the deep geological disposal facility at Yucca Mountain.

During 2003, and in addition to the working groups contemplated in the bilateral agreement between the US Nuclear Regulatory Commission and the CSN in relation to nuclear safety and research, a high level bilateral meeting was institutionalised. This will take place every year.

Two collaboration agreements are in place with France, one with the Directorate General for Nuclear Safety and Radiological Protection (DGSNR) and the other with the Radiological Protection and Nuclear Safety Institute (IRSN).

As occurs every year, a high level bilateral meeting was held in 2003 with the French Regulatory Authority (DGSNR), on this occasion in Cherbourg, France. Among other issues, there were discussions on the French proposal for the classification of incidents at radioactive facilities based on the International Nuclear Events Scale (INES), on the CSN's activities for the licensing and surveillance of radioactive medical installations, on the advantage of a risk-informed regulatory strategy, as opposed to more deterministic approaches, and on the information policy to achieve the confidence of the public.

In the wake of the 7th meeting of the South American Forum of Nuclear Regulators, a bilateral meeting was held between the lady president of the CSN and the director of nuclear safety of the Mexican National Commission for Nuclear Safety and Safeguards (CNSNS), regarding strengthening of the cooperation between the two organisations, in particular with respect to radioactive facilities and the control of sources.

The CSN has two bilateral agreements in place with Sweden, one with the nuclear safety organisation SKI and the other with the radiological protection organisation SSI. Both parties had repeatedly expressed their interest in increasing this collaboration. With this aim in mind, a CSN delegation visited Sweden to establish the foundations for greater collaboration in the future. Meetings were held with the maximum representatives of the two Swedish regulatory organisations and visits were made to waste and spent fuel storage facilities and to a research centre working on the use of radiation for medical purposes.

Another example of bilateral relations, in this case without any agreement in place, is South Korea, with which arrangements have been made for a CSN technician to visit the Research Institute KAERI.

Other regulatory groups

The CSN continuously promotes the exchange of practices with similar organisations, even informally, outside the framework of its multilateral and bilateral agreements.

At the *International Nuclear Regulators Association* (INRA), set up in Paris in 1997, and in addition to the normal issues (the latest novelties relating

to nuclear safety in each country), the debate centred on the safety culture, organisational problems, inspection practices, dismantling and waste management and the difficulties involved in transposing all the international standards governing the transport of radioactive materials.

As regards the *Western European Nuclear Regulators Association* (WENRA), and in view of the forthcoming incorporation of New States into the European Union, it was determined in 2003 that the group should be extended, this now comprising Germany, Belgium, Bulgaria, the Czech Republic, Slovakia, Slovenia, Spain, Finland, France, Great Britain, Holland, Hungary, Italy, Lithuania, Rumania, Sweden and Switzerland. The main objective of the group is to work towards the bringing into harmony of standards and working practices. With this aim in mind, the two WENRA working groups (*Reactor Standardisation* and *Standardisation in Waste and Spent Fuel Management*) are preparing reports comparing the national practices with the IAEA standards.

As regards the *Forum of South American Nuclear Regulators*, the FORUM's 8th Meeting was held in May 2003, attended by the maximum representatives of the regulatory bodies of the member countries and by Chile as an observer. The meeting dealt with the strengthening of the Forum's activities and consideration of an amendment to its current statutes, signed in 1998. The meeting also covered regulatory activities and issues such as the radiological protection of patients and international initiatives regarding the security of radioactive materials, and there was a presentation of the IAEA's activities in relation to the conservation and management of knowledge in the field of nuclear and radiological safety and the project for development of an information and knowledge network for initial and on-going training, as a possible model for the setting up of a South American radiological safety network.

3.4. Research plan

Article 2 of Law 15/1980 of 22nd April assigns to the Nuclear Safety Council the mission of establishing and monitoring research plans in the field of nuclear safety and radiological protection.

During 2003, the fulfilment of this mission translated into 40 projects and the management of an in-house budget of 3,104,000 euros, in accordance with the CSN's research plan. A large part of these research projects were carried out in collaboration with other institutions, in which respect the collaboration with Unesa (Coordinated research plan) Ciemat (framework collaboration agreement) and Enresa was particularly significant.

The objective of the research projects performed is to improve the knowledge of and the methods and tools used by the personnel of the CSN in the performance of their functions, helping them to make their actions more efficient and effective. The projects also allowed the licensee organisations of regulated installations or activities to increase their competence, this also being the case for those organisations, such as research centres and universities, that provide support to the CSN or to the licensees.

The number of projects completed at year end was ten, with thirty others still on-going, 10 in the field of radiological protection and 20 in relation to nuclear safety. The results of the completed projects will be described in a publication entitled *Products and benefits of research projects completed in 2003.*

It is expected that in early 2004 the regulatory basis for the granting of aids for the performance of R&D projects relating to nuclear safety and radiological protection and the resolution of the corresponding invitation for requests will be published in the Official State Gazette.

4. Regulations and standards

In addition to its characteristic advisory, inspection and control functions, and others of an executive nature, the CSN is legally and in due form assigned areas of competence relating to the capacity to propose general standards or to dictate technical provisions, some general in scope and binding and others more specific or issued merely as recommendations.

In this respect, the following standards have been proposed, processed and published during 2003:

Law 62/2003, of 31st December, on fiscal, administrative and social measures, in its article 93 on the modification of the nuclear energy act, Law 25/1964, of 29th April.

Article 93.Modification of the Nuclear Energy Act Law 25/1964, of 29th April (RCL 1964, 988, 1406; NDL 10290).

Which defines experimental devices and installations as being those that use radioactive materials with a view to developing new energy sources. These devices and installations shall be subject to the same system of authorisations as is established in the regulations for nuclear facilities.

Law 62/2003, of 31st December, on fiscal, administrative and social measures, in its article 74 on the modification of Law 15/1980, of 22nd April, by which the Nuclear Safety Council was set up.

Article 74.Modification of Law 15/1980, of 22nd April (RCL 1980, 923; ApNDL 4225), Creating the Nuclear Safety Council.

This establishes the obligation to file and take custody of the documentation to be submitted to the Nuclear Safety Council by the holders of nuclear power plant operating permits on the definitive shutdown of their activities and prior to the transfer of ownership and awarding of the dismantling authorisation for such facilities.

During 2003 the CSN continued to promote and develop various standards projects of different legal standing:

- The *Regulation governing Nuclear and Radioactive Facilities*, approved by *Royal Decree 183/1999, of 3rd December,* (Official State Gazette of 31st December 1999), which replaces the regulation of 21st July 1972, is undergoing a process of internal revision for adaptation to the experience obtained in its application during the last three years.

- The CSN continues to participate in revision of the *Basic nuclear emergency plan*, approved by the Cabinet of Ministers on 3rd March 1989. The aim of this revision is to adapt the Plan to the evolution of the international standards, especially as regards radiological criteria and the experience acquired in the management of the provincial plans, the impact of organisational factors and the problems involved in and study of a general radiological intervention plan.

- A working group is developing proposals including the replacement of chapter XIV of the nuclear energy act, Law 25/1964, of 29th April, which regulates the set of infringements and penalties relating to nuclear issues, technically improving its contents and establishing more rational and proportionate criteria in describing the types of infringements and corresponding penalties.

- The Nuclear Safety Council is currently drawing up a draft text for a future Waste Act, incorporating the philosophy of the *Joint convention on the safety of spent fuel management and on the radioactive waste management*, ratified by

Spain on 11th May 1999, which entered into force on 18th June 2001.

As regards technical standards, the publication in 2003 of the following Safety Guides may be underlined:

- GS - 10.12. *Radiological control of scrap recovery activities*

- GS - 6.2. *Radiological protection for companies performing activities in the field of transport (issuers, transporters and receivers)*

Currently in the publishing phase are guide GS-10.13 *Quality assurance for the dismantling and decommissioning of nuclear facilities*, and GS-.1.7 (Rev.2) *Information to be submitted to the CSN by licensees on the operation of nuclear power plants,* along with the three following Council Instructions (CI):

- IS - 04 Instruction regulating the transfer, filing and custody of documents on the radiological protection of the workers, public and environment, prior to the transfer of ownership of nuclear power plants for their dismantling and decommissioning.

- IS - 05 *Levels of exemption for radioisotopes*

- IS-06 *Definition of training programmes on basic and specific radiological protection at nuclear and radioactive fuel cycle facilities.*

A total 14 guides and instructions are in the internal or external comments, draft or review phase.

5. Management of resources

5.1. Organisational improvement

During 2003, the organisation has made great efforts in drawing up the *CSN mission, vision, values and strategic plan.*

On 15th October 2003, following a period of compilation and analysis of the comments made by the organisation, the Board approved the CSN *Mission and vision* and its characterisation. The definitive text approved reads as follows:

- *MISSION:* The *Mission* of the CSN is to protect the workers, the public and the environment against the harmful effects of ionising radiations, ensuring that the nuclear and radioactive facilities are operated by the licensees in a safe manner and establishing preventive and corrective measures for radiological emergencies, whatever their origin.

- *VISION*: An Organisation independent from the Public Administrations and the licensees of the facilities that reports to the National Parliament. The Organisation is technically qualified such that its proposals and decisions be rigorous and that it be able to undertake its activity efficiently and transparently, in such a manner that it warrant the confidence of Spanish society and be a reference at international level.

- During the second quarter of 2003, a working document of the *Strategic plan* was made available, proposing the three strategic objectives of the organisation: effectiveness (safety of facilities and activities), efficiency and credibility.

- In the context of these strategic objectives, the basic processes of the Organisation were analysed during the last quarter of the year, and those that will in principle be part of the CSN *Process re-engineering project* – performance of which began in December 2003 – were selected and prioritised.

- In compliance with Resolution 19 of the Economy and Finance Commission of the Spanish Congress, of 17th December 2003, which *encourages the CSN to undertake an in-depth analysis of essential skills allowing it to plan its human resources in the medium to long term and define a training programme ensuring the development and maintenance of the essential skills identified*, the CSN is analysing the actions required to undertake an in-depth analysis of essential skills allowing it to plan its human resources in the medium to long term and define a training programme ensuring the development and maintenance of the essential skills identified. In this respect, contacts have been maintained with the SKI and the NRC (the Swedish and North American organisations having functions similar to those of the Council), and has acquired information on the essential skills management systems implemented by these organisations.

Improvement of regulatory process

During 2003 significant progress has been made in improving the efficiency of the regulatory process, with performance of the activities approved in the mandates of the improvement tasks identified. The schedule of activities relating to these tasks encompasses 2004. As of the end of the year, drafts were in place for practically all the improvement tasks, these now being subjected to a process of comments and approval.

The improvements foreseen affect the CSN's four main processes (evaluation, inspection and control, standards and corrective actions) and the processes of the licensees interfacing with them.

The constitution of a *working group* including the participation of the licensees allows work to be performed jointly, taking into account the principle of collaboration and mutual confidence, a particularly adequate approach for the optimisation of processes in which there are clear interdependences.

Development of the inspection model

During 2003 work has continued on development of the current CSN Inspection Model, which covers the inspections of all types of facilities and activities regulated by the Council.

In keeping with the inspection model, management procedures have been drawn up for the inspection activities to be performed at nuclear and radioactive facilities.

One part of the nuclear power plant inspections contemplated by the Model is what is known as the *Basic inspection programme*, which is a set of inspections to be carried out every two years with respect to the most significant processes taking part at the plants, such that there be a systematic and periodic guarantee of the main activities carried out at the plants being performed safely and in accordance with the applicable standards. During the period 2001-2002 the first phase of the basic programme was performed, and the part corresponding to second two-year period, scheduled to end in 2004, has been undertaken throughout 2003. These aspects are contemplated in the first chapter of this Summary Report and are related to Resolution 23 of the Economy and Finance Commission, of 9th October 2002.

Throughout 2003, the activities for development of a new risk-informed inspection model have been intensified with the contracting of an engineering firm providing support for the CSN in the performance of these tasks. In this respect, a multidisciplinary risk-informed inspection was performed in September 2003 at Almaraz nuclear power plant. This inspection lasted two weeks and a number of lessons were learned from it.

In view of this experience, a similar inspection is scheduled for performance at the rest of the Spanish nuclear power plants during 2004.

Planning and tracking

The CSN continued the implementation of the *command panel* for the activities of the Organisation, made up of a series of indicators associated with the processes of emergency management, inspection and reporting to the Administration. This allows for more accurate evaluation and measuring of the efficiency of these activities, which are carried out by the Organisation and by the Autonomous Communities with which there are assignment agreements.

During the last quarter of the year studies and analyses were performed in order for a new system of activities planning and tracking to be designed and implemented within the organisation during 2004.

Internal Quality Plan

During 2003 a total 7,559 hours have been dedicated to internal quality and 13,924 to planning, these figures representing 1.2% and 2.28% respectively of the hours available.

As of 31st December a total 84 procedures had been approved, 25 on management, 10 administrative and 49 technical. Eleven procedures were approved during 2003.

Information systems plan

The following activities have been particularly significant:

- The inspections consultations model of the information system of the Directorate of Nuclear Safety was concluded, as was implementation of *version 2* of the personnel licences manage-

ment system, the development of an IGPs version under LINUX and the new legal reports archive.

- Version 1 of the revenues management system has entered production.

- The migration of mail to Exchange 2000 and of ORACLE databases to *version 9* was completed and new high availability network servers were installed.

- The Virtual Private Network (VPN) is in the implementation phase. This will allow for external access to the CSN network with full guarantees of security and confidentiality for duly authorised users, such as the assigned authorities of the autonomous communities, resident inspectors and CSN portable computers.

- The Nuclear Safety Council has signed a collaboration agreement with the Spanish Mint for the latter to provide the CSN with electronic signature certification services.

Training plan

Training is especially important for an organisation of the characteristics of the CSN, due to the technology, management and procedural changes that occur in areas affecting its activity and performance.

The CSN's training activities programme for 2003 adopts a systematic approach similar to that applied in previous years, with the activities grouped into six major basic training blocks. The areas covered by the Plan are as follows: Nuclear safety techniques, Radiological protection techniques, Development of management skills, Administrative and managerial organisation and communication, information systems and languages.

The budget assigned to the *Training plan* in 2003 amounted to 542,130 euros and the cost of the training activities carried out during the period reached the sum of 405,352.49 euros, a degree of economic application of 74.77 %.

During 2003 a total 93 training activities were carried out, with 996 attendances. Approximately 340 CSN workers participated, with an average number of three attendances per person.

Aware of the impact of worker training for the efficient performance of the functions assigned to the Organisation by the legislation in force, the CSN has initiated a process of training optimisation linked to the *Mission and Vision of the Organisation.*

5.2. Management of human and economic resources

As of 31st December 2003, the total workforce of the Organisation numbered 446, with women representing 48.65% of the CSN staff.

During 2003 selection processes were initiated to cover eight posts by the system of free appointment and four professional civil servants were appointed, to the Upper Management of the Nuclear Safety and Radiological Protection Technical Division.

As regards the public offer of employment during 2003, selective tests were held for incorporation into the Upper Management of the Nuclear Safety and Radiological Protection Technical Division, a total seven open shift posts being available.

The Initial list of personnel job posts has been submitted to the competent authorities, this including the new wage bonuses approved by the *Negotiations commission of the single workers' agreement,* which replace those previously existing in the Council Agreement.

Economic aspects are broken down into budgeting items and financial items, the accounting of the Organisation complying with the requirements of the *General public accounting plan*. The initial budget of the CSN for the 2003 financial year was 42,924 thousand euros. This initial budget did not experience any increase as a result of the budget modifications made during the year. Compared to the previous year, the initial budget increased by 16.01 %.

The budgeting items cover the following:

- Execution of the revenues budget. The variation in revenues with respect to the previous year amounted to 1.91 %. As regards revenues, the fee for services rendered was the main source of financing for the CSN.

- Execution of the expenses budget. The variation in expenses with respect to the previous year amounted to 7.98 %.

The commitments acquired to the sum of 34,076 thousand euros, represented 79.4% of the definitive budget forecast. It should be pointed out that the total liabilities recognised amounted to the sum of 33,084 thousand euros, this representing a degree of execution of 77.14 % with respect to the definitive budget.

Mention should be made of the fact that personnel expenses were quantitatively the most important, since they represented 57.2 % of the total. Personnel expenses include salaries and wages, the social security paid by the employer and social welfare costs.

In second place were external services, with 30.8%, the fundamental components of which were the services of independent professionals, maintenance expenses and communications.

The result for the financial year was a negative balance of 1,823 thousand euros.