TURKISH ATOMIC
ENERGY AUTHORITY

TURKEY'S NATIONAL REPORT

SUPPLEMENT REPORT NO: 1

ON COMPLIENCE WITH THE OBLIGATIONS OF
THE CONVENTION ON NUCLEAR SAFETY

ANKARA, SEPTEMBER 2001

INTRODUCTION

As it was given in Turkey's National Report (TNR) submitted to the First Review Meeting, main national organizations involved in nuclear power project activities in Turkey are the Ministry of Energy and Natural Resources, the State Planning Organization (DPT), the Turkish Electricity Generation and Transmission Corporation (TEAŞ), the Turkish Atomic Energy Authority (TAEK) and the Ministry of Environment. In this list, TEAŞ was the utility to operate a nuclear power plant.

However, financial problems that Turkey has to overcome, affected various aspects of nuclear power program and both the status and the infrastructure has been changed since 1999 review meeting.

The tender for Akkuyu Nuclear Power Plant have been cancelled by the government in July 26th 2000, while keeping the nuclear power program alive. Declaration of the government clearly stated the need for nuclear power, but postponement of the nuclear power program out of necessity for an indefinite period. The same declaration requested the Turkish experts to work meanwhile on inherently safe and innovative designs.

Simultaneously, the privatization activities of electricity sector have been started. A new law has been drawn on electricity market, which requires the utility organization TEAŞ to be divided into three new corporations. The Electricity Market Law, reconfiguring the sector, was accepted by the parliament on Feb. 20th, 2001 and published on the Official Gazette.

The objectives of this law are to formulate the Electric Energy Market in order to serve the electrical energy in a qualified, safe, low priced and sufficient way in accordance with the environment and also to provide independent regulations and inspections in the electricity market. The electrical power generation, distribution, wholesale and retail sale, export and import and the illustrated actions of real and juristic persons are within the frame of the law. Also, the establishment and working principles of Electricity Market Regulation Authority and method for privatization of electricity distribution means are the other subjects taken up by the law.

The Electricity Market Law foresees the establishment of Electrical Market Regulation Authority in order to carry out the duties of licensing, inspecting, regulating, pricing and making estimations for the energy sector. The Electricity Market Regulation Committee is the representative and decision body of the authority. According to the law, Turkish Electricity Generation and Transmission Corporation (TEAŞ) will be divided into three corporations, Turkish Electricity Transmission Corporation, Turkish Electricity Trade and Engagement Corporation and Electricity Generation Corporation. It is expected that the new structure will be in implemented through the end of 2002, and the possible operating organization for a nuclear power plant will be the Electricity Generation Corporation.

While "Basic Turkish Safety Principles for NPPs" (Annex III of TNR) of TAEK covers all foreseeable regulatory needs of licensing of a nuclear power plant, Dept. of Nuclear Safety initiated an activity to enhance the national regulatory structure and competence on nuclear safety, which will be explained in Article 7.

This document has been compiled as a supplementary report, containing only updated information reflecting the changes since the submission of the Turkey's National Report (TNR) for the First Review Meeting.

REVIEW OF THE NATIONAL STATUS

A. GENERAL PROVISIONS

EXISTING NUCLEAR INSTALLATIONS (ARTICLE 6)

There is no change since 1999 regarding Article 6 of the Nuclear Safety Convention.

B. LEGISLATION AND REGULATION

LEGISLATIVE AND REGULATORY FRAMEWORK (ARTICLE 7)

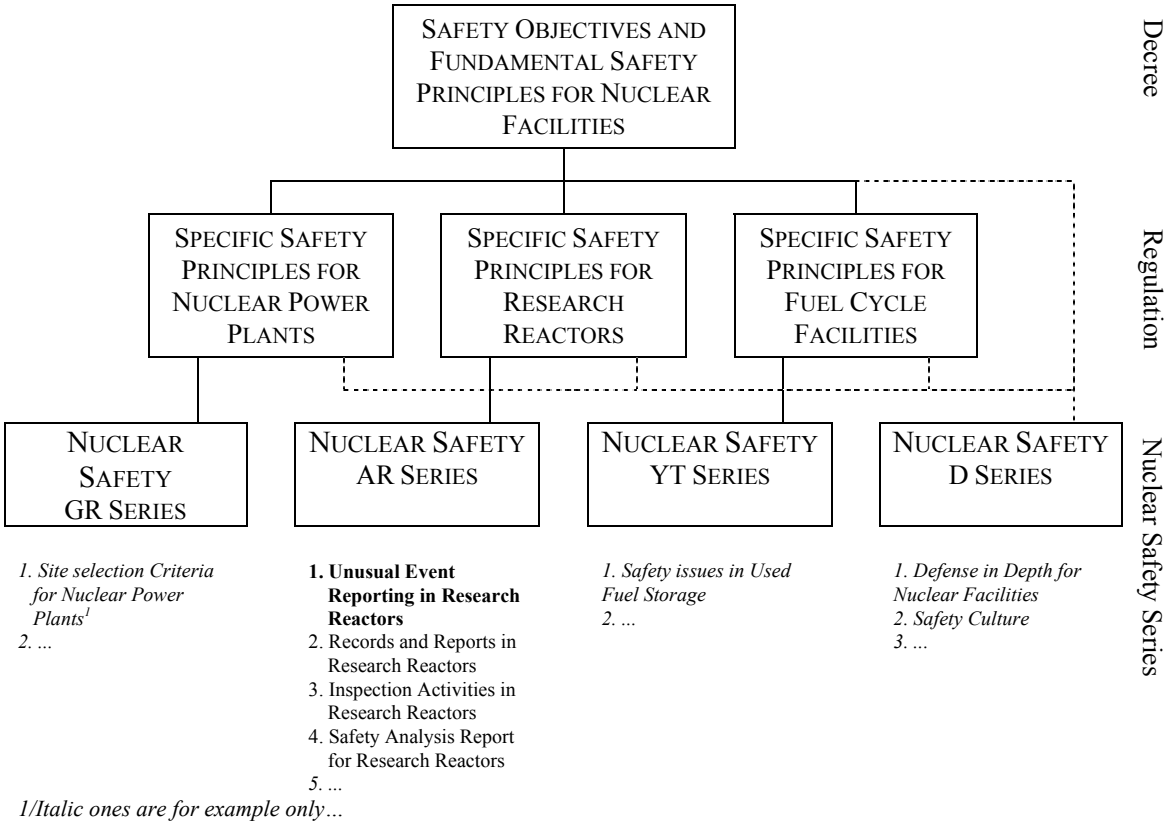
The regulatory activities concerning the nuclear installations in Turkey are within the responsibility of TAEK. However, The Ministry of Environment has also jurisdiction over nuclear installations regarding the issues relevant to the environment.

In 2001, The Ministry of Environment has been started a project on revision of the "Decree on Environmental Impact Assessment" in order to conform to the European Union regulations. This revision proposes that all the nuclear reactors having 1 kW thermal power or above is subject to Environmental Impact Assessment report. Rest of the nuclear reactors requires "Environmental Impact Study." Since the "Decree Pertaining to Issue of Licenses for Nuclear Installations" requires the owner to obtain all relevant permits from other governmental bodies prior to application for license, any proposed nuclear power plant will be required to conform to the "Decree on Environmental Impact Assessment."

While "Basic Turkish Safety Principles for NPPs" of TAEK covers all foreseeable regulatory needs of licensing of a nuclear power plant, Turkey still has limited number of national regulations on nuclear safety. Considering new status of nuclear power program and responsibilities on modifying of existing and drawing up of new regulations when necessary, Dept. of Nuclear Safety (DNS) of TAEK formed a working group on regulations. A comprehensive study on the regulatory structure and priorities has been carried out.

Current outcome of this working group are the structure of the proposed regulations, and two sets of documents containing the regulations at various levels. The structure of the proposed regulations is given in Fig. 1.

Figure 1. Proposed Regulatory Structure



In this structure, safety objectives and basic principles, applicable to all nuclear facilities will be issued as a decree. This decree will be supported with specific principles for different nuclear facilities, to be drawn up in three regulations. Finally, requirements, acceptance criteria and procedural details will be given in Nuclear Safety Series, which is to be prepared, adopted and modified according to a regulation, also defining its binding status. According to the working plan, documents will be prepared regarding this scheme, and they won't be issued as regulation until after most of them are ready. This will provide us with time to see the possible deficiencies and modify them before they are issued as regulations.

Within this context, the working group completed the work on the documents, "Safety Objectives for Nuclear Installations", "Fundamental Safety Principles for Nuclear Installations" from the regulatory structure and "Regulation for Preparation, Adoption, Entry into Force and Modification of Nuclear Safety Series Documents" as supplementary regulation. These documents were adopted by the decision making body, Atomic Energy

Commission of TAEK. Hence, these documents gained a legally binding status prior to be issued as a regulation.

Group continues to work on third document of the regulatory structure, "Specific Safety Principles for Nuclear Power Reactors." These documents are mainly based on the IAEA INSAG and Safety Standards Series and supported by the regulations of supplier countries. Meanwhile, smaller groups have been formed to draft the documents from nuclear safety series. Considering national programs, priority is given to the details for the safety of research reactors. First document given in Nuclear Safety AR series (Fig. 1) has been drafted and made ready for review of relevant departments of TAEK. Two other small groups were formed to draft the second and third document, and studies continue. Drafting the forth document of the series is planned to start by 2002.

Being a member of IAEA and OECD/NEA, Turkey continued its international activities through international and bilateral agreements. A revised list of international and bilateral agreements in which Turkey is a party is given in Annex I.

REGULATORY BODY (ARTICLE 8)

Regulatory Body of Turkey is the Turkish Atomic Energy Authority (TAEK), which undertakes all the regulatory activities concerning nuclear and radiation safety together with the research, development and promotion on nuclear field.

As it was mentioned TNR, Dept. of Nuclear Safety (DNS) is responsible from the most of the regulatory activities within the Authority, while QA/QC and radiation safety activities are performed by different departments. There is a strong intend on collecting all regulatory activities within the DNS through the reorganization activities currently going on. Clear line of responsibilities has been drafted for both DNS within the Authority and divisions within the departments.

After the discussions on administrative level, the reorganization activities are expected to be taken into consideration by AEC through the end of 2001. The departmental structure of TAEK (Fig. 2) is not expected to change during this activity, while the divisions under the departments are. The proposed structure of the DNS is given in Fig.3.

Regarding the amount of work involved in licensing of a nuclear power plant, DNS has been supported in terms of human resources by two means in recent years. First, the number of experts working in the DNS has been increased. Second mean of support is provided through

an organization within the Authority, Licensing Coordination Groups (LCG). LCG, which will be explained in detail under Article 14, consists of around 80 experts from different departments of TAEK and supports the licensing activities in coordination with the DNS experts.

Figure 2. Organizational Structure of TAEK

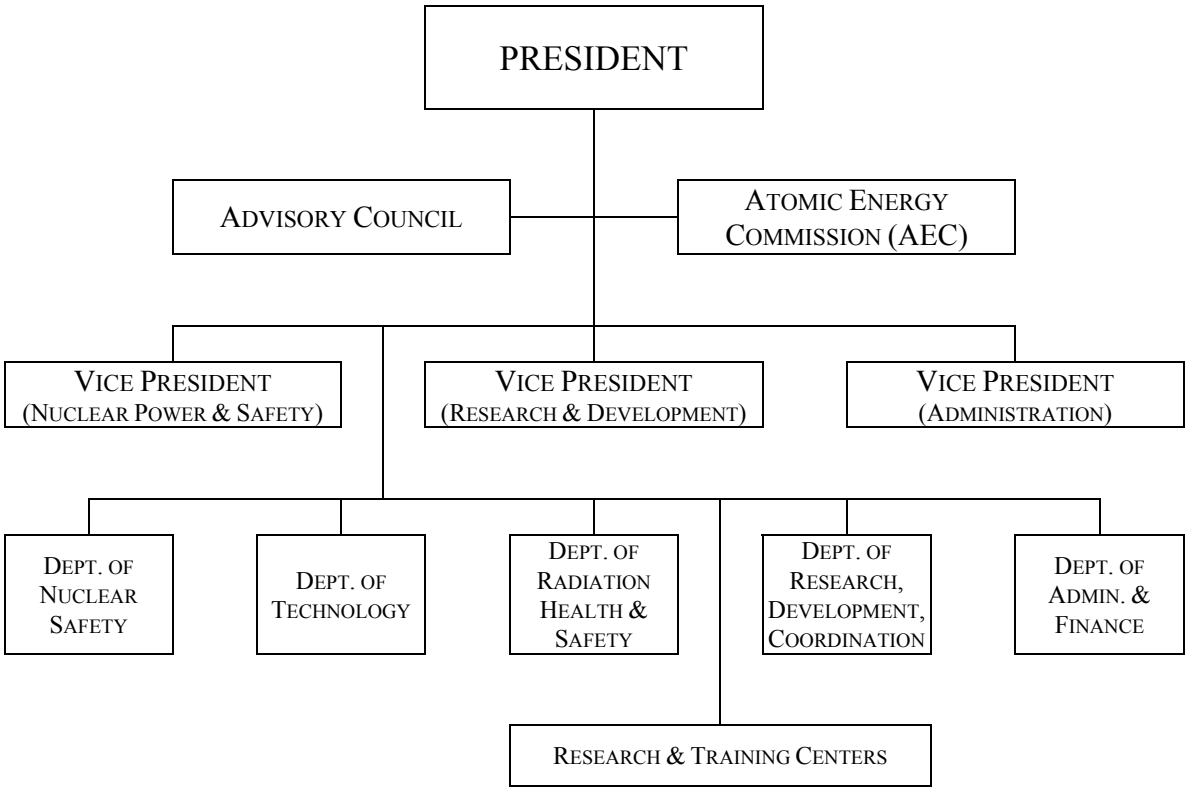
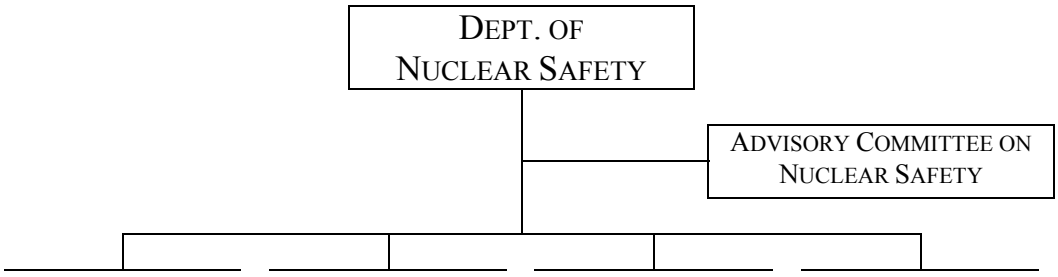


Figure 3. Proposed Structure of DNS



DIVISION OF INSPECTIONS	DIVISION OF NUCLEAR MATERIAL SAFETY	DIVISION OF SAFETY EVALUATIONS	DIVISION OF INFORMATION AND INTERNATIONAL RELATIONS

RESPONSIBILITY OF THE LICENSE HOLDER (ARTICLE 9)

Prime responsibility for the safety of a nuclear installation is on the holder of the relevant license, and this responsibility is clearly stated in "Fundamental Safety Principles for Nuclear Facilities" document. This responsibility also covers the activities related to the documentation, maintenance, preparing reports, changes in operational limits and conditions, conducting experiments, operation, decommissioning with the approval of TAEK.

Besides, the Article 7 of the licensing decree (Annex IV of TNR) states that "Applicant shall provide insurance or other financial guaranties according to the provisions of the Paris Convention on Third Party Liability in the Field of the Nuclear Energy, ratified by the Act No. 229 dated 8 may 1961, and its attachments and amendments."

Turkey is a party to the "Paris Convention on Third Party Liability in the Field of the Nuclear Energy." A study on drafting necessary national regulations on this subject was started a few years ago. However, taking into consideration that Paris Convention is currently under revision and drastic changes are expected in the provisions of the Convention, this study has been suspended for waiting for the outcome of revisions to avoid unnecessary repetition of the legalization procedures. It will be re-started upon revision of the Paris Convention.

C. GENERAL SAFETY CONSIDERATIONS

PRIORITY TO SAFETY (ARTICLE 10)

The main mission of TAEK is to ensure that the use of nuclear energy in Turkey does not pose undue risk to health and the environment. This objective and the priority given to safety are also emphasized in new regulatory documents, "Safety Objectives for Nuclear Installations" and "Fundamental Safety Principles for Nuclear Installations." The issue of priority to safety is accepted as one of the main principles of upcoming documents and regulations, mentioned under Article 7.

FINANCIAL AND HUMAN RESOURCES (ARTICLE 11)

The financial and human resources of the utility will be clarified after the completion of reorganization activities required by Electricity Market Law.

HUMAN FACTOR (ARTICLE 12)

Importance of human factors are clearly stated in several articles of "Fundamental Safety Principles for Nuclear Installations" document, and planned to be handled in detail in documents on specific safety principles for different nuclear installations given in Fig. 1.

QUALITY ASSURANCE (ARTICLE 13)

In addition to regulations given in TNR, new regulations on QA activities were issued since the First Review Meeting. A list and scopes of these regulations are given in Annex II.

ASSESSMENT AND VERIFICATION OF SAFETY (ARTICLE 14)

Since the "Decree Pertaining to Issue of Licenses for Nuclear Installations" is still effective, and there is no revision on the decree, the licensing procedures are the same in Turkey. However, before the government has canceled the Akkuyu NPP tender, TAEK had been prepared for licensing activities. Assessing the current status by that time, regulations and human resources available for licensing activities, administration decided to support the DNS through a group of experts.

Figure 4. Licensing Coordination Groups

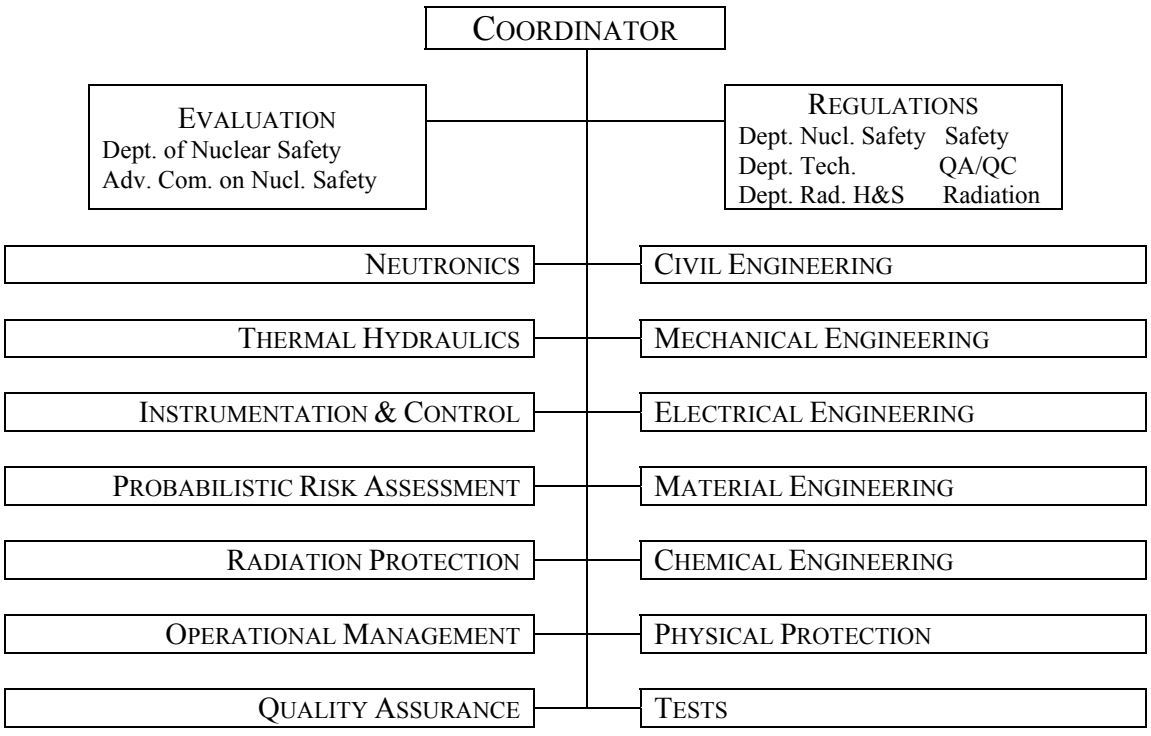
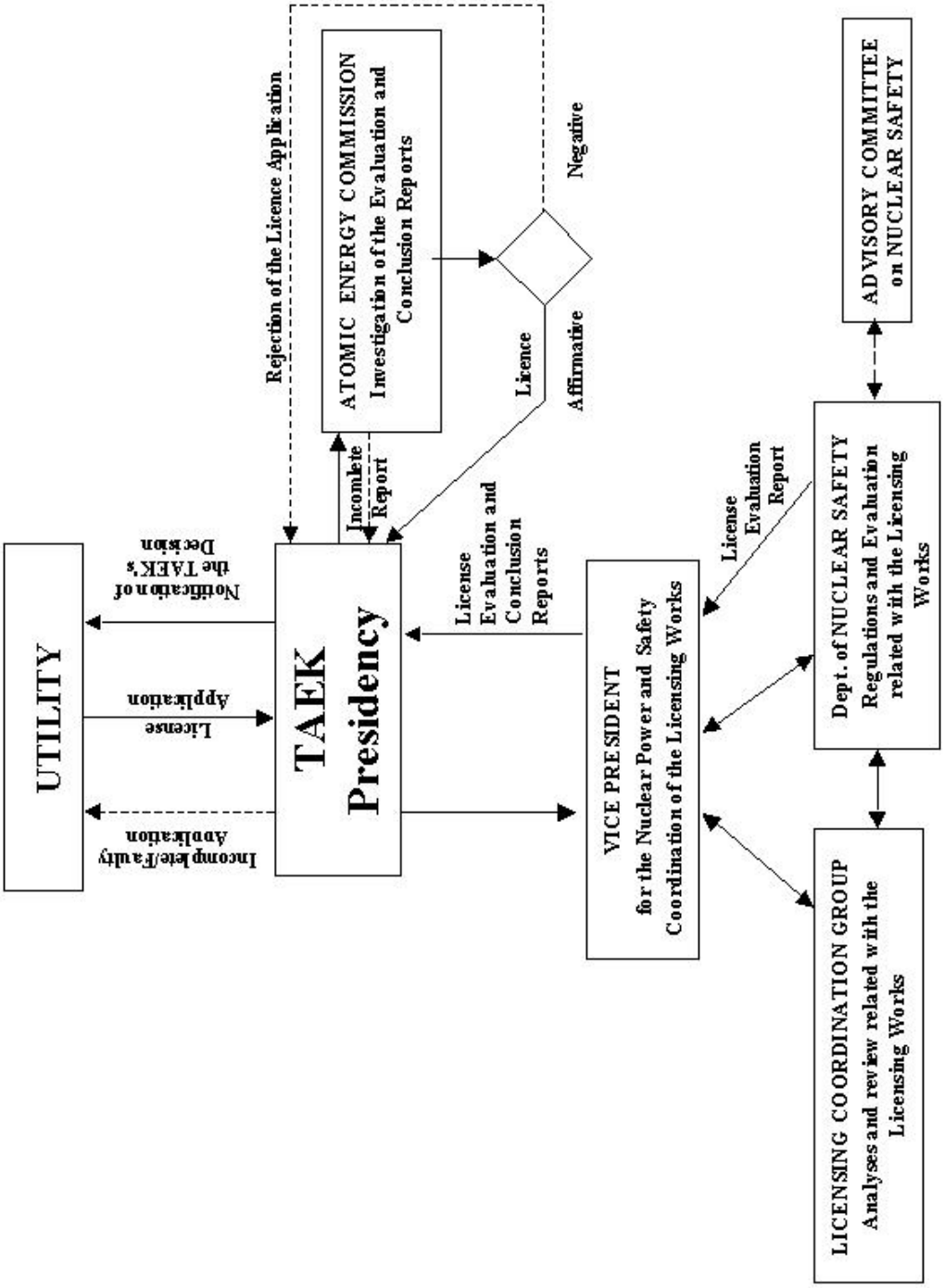


Figure 5. Licensing Flowchart



All expert capacity of TAEK on nuclear field has been surveyed and experts with some relevant background for licensing activities has been organized within a structure called

"Licensing Coordination Groups" (Fig. 4). Primary reason of establishing LCG is to support the DNS in safety assessment and verification activities during licensing process by making use of experts working in different departments and centers of the Authority.

There is no change in licensing procedures. The Vice President for nuclear power and safety acts as the coordinator of the LCG. Department of Nuclear Safety has an officer in each group to provide information exchange between the groups and the department. The technical secretary of the LCG carries out the information exchange among the groups and the scheduling of the work to be done.

Work definition of each group can be generalized as assessing the relevant parts of SAR and reporting the outcomes to the technical secretary and the DNS for evaluations. Final report on evaluation of PSAR or SAR will be prepared in DNS. Therefore, embedding the LCG into the licensing procedure will give a flowchart as seen in Figure 5. Each application regardless of its level – permit or license – is handled through the same line. Application is given to the Authority. Vice President for nuclear power and safety coordinates all licensing activities.

Documents given by applicant are assessed and evaluated by LCG and DNS, together. Whenever necessary, any further help can be sought from ACNS and national or international expert organizations. Evaluation report is given to the Vice President. Vice President adds a report of his activities and gives both reports the President. President conveys the issue to AEC. An affirmative AEC decision is called License or Permit.

RADIATION PROTECTION (ARTICLE 15)

The Radiation Safety Regulation, revised in accordance with 96/29 and 97/43 Euratom Council Directives, IAEA Basic Safety Series 115 and the recommendations of ICRP-60, has been in force since 24 March 2000.

The revised dose limits specified in the Article 10, 11 and 12 of the Radiation Safety Regulation (RSR) are stated below:

Article 10 of RSR: Annual Dose Limits

The annual dose limits, which will not cause any health hazard, have been determined by the Authority for both public and the radiation workers in harmony with the international standards. The annual total dose is the sum of the external and internal doses received (exposed) in the same year. Radiation exposures from controlled sources and practices are not permitted to exceed these limits. Medical exposures and natural radiation doses shall not be included in these limits.

a. *The effective dose for radiation workers shall not exceed 50 mSv in any single year, and 20 mSv per year averaged over 5 consecutive years. The annual equivalent dose limit is 500 mSv for hands, feet or the skin, and 150 mSv for eye-lens.*

b. *The effective dose for members of the public shall not exceed 5 mSv in any single year, and shall not exceed 1 mSv per year averaged over 5 consecutive years. The annual equivalent dose limit is 50 mSv for hands, feet or skin, and 15 mSv for eye-lens.*

c. *According to the Article 6 of the Decree, persons under age of 18 cannot be employed in jobs involving radiation applications. In the areas specified in Article 15 of this Regulation, the effective dose for apprentices and students of age 16-18 who need to use sources in the education or training shall not exceed 6 mSv in a single year, provided that such practice is solely for educational purposes. However, the annual equivalent dose limit for hands, feet or skin is 150 mSv, and 50 mSv for the eye-lens.*

Article 11 of RSR: Planned Exposures for Special Cases

These exposures are the exposures subject to permission from the Authority in exceptional situations involving exposure to effective doses over annual equivalent dose limits during normal operations, when alternative techniques that do not involve such exposure are not available. The dose limits for radiation workers, who are likely to be exposed in special cases shall not exceed 50 mSv in a single year, and the average annual dose exposed shall not exceed 20 mSv for 10 consecutive years and 100 mSv as total.

The radiation workers that have been exposed to five folds of the annual equivalent dose and the woman having reproductive capacity shall not be assigned for planned special exposures.

Article 12 of RSR: Dose Limits for Radiation Workers Having Reproductive Capacity

It is obligatory to take the required measures to ensure that the exposed radiation dose by the radiation workers of reproductive capacity is kept as low as possibly achievable. The radiation workers whose pregnancy has been declared shall only be assigned to works done in supervised areas.

For the purpose of protecting the fetus, the equivalent dose limit for the abdominal area of the pregnant radiation workers during pregnancy is 1 mSv.

The requirements, specified in the Article 34 and 35 of the Radiation Safety Regulation for the discharge of Radioactive Substances to the environment, are stated below:

Article 34 of RSR: Discharge of Radioactive Substances to the Environment

It is obligatory to take permission from the Authority prior to practices requiring the discharge of radioactive substance to the environment. In order to get this permission, the Licensee shall prepare a report incorporating the following information, and make a written application to the Authority:

a. *The characteristics, quantity and radioactivity level of the radioactive substances to be discharged to the environment;*

b. *The critical groups which may be exposed due to the planned discharge;*

c. *The all significant exposure pathways by which discharged radionuclides could reach critical groups;*

d. *The measures to be taken regarding to radiation safety.*

Discharge of radioactive substances of certain characteristics and quantities shall be permitted if the issues included in the report are considered as appropriate in terms of radiation safety and

environmental health. In case of any insufficiency determined by Authority experts in the report, such insufficiencies shall be completed within a given period and the release of radioactive substances shall not be permitted during this period.

Article 35 of RSR: Inspection and Monitoring the Radioactive Substances Discharged to the Environment

The establishments discharging radioactive substances to the environment are obliged to comply with the limits permitted by the Authority, and shall be responsible for carrying out the required inspection and monitoring, and reporting the results to the Authority periodically. The Authority may carry out an additional environmental monitoring program, if deemed necessary.

The applied principles and rules specified in the Article 7 of the Radiation Safety Regulation to ensure that the radiation exposures kept as low as reasonably achievable are stated below:

Article 7 of RSR: Basic Principles of Dose Limitation System

The dose limitation system used in radiation protection shall be based on the following three principles:

a) *Justification of the Practices: No practice involving exposures to radiation should be authorized unless it produces sufficient benefits to the exposed individual or to society offset the radiation harm that it may cause.*
b) *Optimization of Radiation Protection: In all possible applications requiring radiation exposure, except for medical purposes, the amount of individual doses and the number of persons to be irradiated shall be as low as reasonably achievable in all radiation exposures, taking into consideration the economic and social factors.*
c) *Dose Limitation: The normal exposure rates of individuals, the effective and equivalent dose taken in by the related tissue or organ due to any permitted radiation exposure, shall not exceed the annual dose limits provided in Article 10 of this Regulation.*

EMERGENCY PREPAREDNESS (ARTICLE 16)

Turkey has issued, based on the related IAEA technical documents, the Regulation on Nuclear and Radiological National Emergency Preparedness on 15 January 2000. On the other hand, TAEK has a Nuclear and Radiological Emergency Response Plan to be used in the event of a nuclear accident or radiological emergency. Since Turkey has no NPP, the regulation and the plan concerns only for off-site emergencies.

The Regulation on Nuclear and Radiological National Emergency Preparedness covers, in general, the organizational issues, and the roles and responsibilities of related ministries, organizations and institutions. Related ministries, organizations and institutions set forth in the regulation keep developing their own guides in connection with the Emergency Response Plan of TAEK.

According to the national regulation, in case of nuclear and radiological emergency, TAEK makes decisions and gives advices for protective measures and the measures are implemented in coordination with the other participating agencies.

Nuclear and Radiological Emergency Response Plan of TAEK, aiming the determination of the measures to be taken and activities to be performed in order to protect individuals, public and the environment, is to be activated with the initial notification of emergency and deactivated when all related agencies have completed their tasks. In the Plan, implemented and coordinated by the TAEK, emergency organization, emergency preparedness activities, and protective measures are briefly explained and intervention levels, contact points of national and international organizations, notification procedures, inventory of monitoring equipment, etc. are included as well.

As the requirement of the national crises legislation and the Plan, The Emergency Response Center under direct supervision of the President of TAEK has been established with the participation of the representatives of related departments of TAEK. The Center is connected to the national and international information centers on line, i.e., IAEA, INES and RESA (Radiation Early Warning System of TAEK). At present, 36 online RESA stations are in operation. It is aimed to reach 63 online RESA stations at the end of 2001.

Besides, Turkey has bilateral agreement with Bulgaria on early notification of a nuclear accident and exchange of information on nuclear facilities. The Agreement on the same subject has been signed with Ukraine in Nov. 23rd 2000, whereas negotiations with Russia and Romania are in progress.

D. SAFETY OF INSTALLATIONS

SITING (ARTICLE 17)

Safety aspects of siting of nuclear installations have been also considered in "Fundamental Safety Principles for Nuclear Installations" document. The general approach on siting issues are planned to be detailed in documents covering specific safety principles for particular nuclear installations. Regarding the siting of nuclear power plants, specific principles are drafted but yet to be adopted by the AEC. Additional regulations regarding quality assurance activities during siting of a nuclear power plant were mentioned under Article 13.

DESIGN AND CONSTRUCTION (ARTICLE 18)

Safety aspects of design and construction of nuclear installations have been considered in "Fundamental Safety Principles for Nuclear Installations" document. The general approach on design and construction issues are planned to be detailed in documents covering specific safety principles for particular nuclear installations. Regarding the design and construction of nuclear power plants, specific principles are drafted but yet to be adopted by the AEC.

OPERATION (ARTICLE 19)

Safety aspects of operation of nuclear installations have been considered in "Fundamental Safety Principles for Nuclear Installations" document. The general approach on operational issues are planned to be detailed in documents covering specific safety principles for particular nuclear installations. Regarding the operation of nuclear power plants, specific principles are being drafted.

ANNEX I

RECENT INTERNATIONAL COOPERATION, BILATERAL AND MULTILATERAL AGREEMENTS

A. INTERNATIONAL CONVENTIONS AND TREATIES

- Protocol Additional to the Agreement Between the Government of the Republic of Turkey and the IAEA for the Application of Safeguards in Connection with NPT (93+2)
  Signature: 6 June 2000
- Zangger Committee membership
  21 October 1999
- Nuclear Suppliers Group membership
  20 April 2000

B. BILATERAL COOPERATION AGREEMENTS

- Agreement Between The Government of France and The Government of Turkey for Cooperation in The Peaceful Uses of Nuclear Energy
  Signature: 21 September 1999
- Agreement Between The Government of USA and The Government of Turkey for Cooperation in The Peaceful Uses of Nuclear Energy
  Signature: 26 July 2000

C. BILATERAL AGREEMENTS ON EARLY NOTIFICATION

- Agreement Between the Cabinet of Ministries of Ukraine and the Government of Republic of Turkey on Early Notification of a Nuclear Accident and on Exchange of Information on Nuclear Facilities
  Signature: 23 November 2000

ANNEX II

RECENT REGULATIONS ON QA

1) Regulation on General Safety Rules Related to the Siting Activities of Nuclear Power Plants, (date: 25.02.2000, No: 23975 Official Journal)
   Scope: This regulation provides criteria and procedures recommended for safety in nuclear power plant siting.
   Based on Code on Safety of Nuclear Power Plants: Siting Safety Series No. 50-C-S
2) Regulation on Fundamental Criteria of Quality Assurance Program for Nuclear Installations, (date: 12.03.2000 dated and No: 23991 Official Journal)
   Scope: The purpose of this regulation is to specify the requirements for preparation and implementation of an effective Quality Assurance Program by the Applicant who applied for the approval or licensing of a nuclear installation.
   Based on QA Programs for Nuclear Facilities (AECB)
4) Regulation on Quality Assurance Criteria in Scope of PSAR, (date: 15.02.2000 dated and No: 23965 Official Journal)
   Scope: The purpose of these regulations is to determine the standard format for the safety analysis reports and to specify the required information for the evaluation
   Based on US AEC Reg. Guide 1.70.6
5) Regulation on Quality Assurance for the Survey and Evaluation Related to Nuclear Power Plant Site Selection (approved by the Atomic Energy Commission and to be published at the Official Journal)
   Scope: The purpose of the Quality Assurance Program during siting activities for nuclear power plants is to establish a basis for the control and verification of all activities affecting quality of the results of survey, evaluation and confirmation of nuclear power plant sites and to ensure that the required quality of these results is achieved.
   Based on the Manual on Quality Assurance for the Survey, Evaluation and Confirmation of Nuclear Power Plant Sites: IAEA-TECDOC-41