REPUBLIC of TURKEY

A FULL REPORT

TO

THE 7TH REVIEW MEETING

OF

CONVENTION ON NUCLEAR SAFETY

August 2016

TURKISH ATOMIC ENERGY AUTHORITY

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LIST OF ABBREVIATIONS

ACNS: Advisory Committee on Nuclear Safety

AEC: Atomic Energy Commission

AFAD: Disaster and Emergency Management Presidency of Prime Ministry (DEMP)

APC: Akkuyu NPP Electricity Generation Joint-Stock Company

BOO: Build-Own-Operate

BDBA: Beyond Design Basis Accident

CBRN: Chemical, Biological, Radiological or Nuclear

CMS: Configuration Management System

CNAEM: Çekmece Nuclear Research and Training Center

CNS: Convention on Nuclear Safety

DBA: Design Basis Accident

DBEE: Design Basis External Event

DG: Diesel Generators

DEMC: Disaster and Emergency Management Centre

DNS: Department of Nuclear Safety

ECURIE: European Community Urgent Radiological Information Exchange

EIA: Environmental Impact Assessment

ENSREG: European Nuclear Safety Regulators Group

EUAŞ: Electricity Generation Company

EUR: European Utility Requirements

FSAR: Final Safety Analysis Report

IAEA: International Atomic Energy Agency

IGA: Intergovernmental Agreement

INIR: Integrated Nuclear Infrastructure Review

ISO: International Organization for Standardization

IWP: Integrated Working Plan

MENR: Ministry of Energy and Natural Resources

MoEU: Ministry of Environment and Urbanization

NEPIO: Nuclear Energy Project Implementation Department

NGO: Non-governmental organizations

NPP: Nuclear Power Plant

NREP: National Radiation Emergency Plan

QMS: Quality Management System

PM-DEMC: Prime Ministry - Disaster and Emergency Management Centre

PSAR: Preliminary Safety Analysis Report

RESA: The Early Warning Environmental Radiation Monitoring System

RAW: Radioactive Waste

SARCoN: Systematic Assessment of Regulatory Competence Needs

SFP: Spent Fuel Pool

SPR: Site Parameters Report

TAEK: Turkish Atomic Energy Authority

TEK: Turkish Electricity Company

TSO: Technical Support Organization

1 INTRODUCTION

On September 24, 1994 Turkey signed the Convention on Nuclear Safety (CNS). After the ratification of the CNS by Turkish Parliament and officially becoming a Contracting Party on January 14, 1995, Turkey presented its national reports in accordance with the provisions of Article 5 of the CNS in the previous review meetings that were organized to review the implementation of the CNS.

Turkey took an active and positive role in attending meetings and reviewing national reports during all review meetings and intends to continue the same manner in the upcoming Review Meetings of the Parties to the CNS.

As presented in the previous National Reports, Turkey has currently no nuclear power plant in operation, under construction or decommissioned. However, there are two active nuclear power projects namely Akkuyu Nuclear Power Plant (NPP) and Sinop NPP. This 7th National Report has been developed in full compliance with the requirements of the "Convention on Nuclear Safety and Guidelines Regarding National Reports under the Convention on Nuclear Safety (INFCIRC/572/Rev.4)" and also by using "Template to support the drafting of National Reports, IAEA".

The National report was prepared to reflect the latest developments in nuclear power programme in Turkey. For this reason, the chapters related to the establishing nuclear infrastructure and siting have been prepared in detail to inform contracting parties of the CNS.

Also, the report still contains a subchapter within the "Summary" listing the actions taken in the light of lessons learned after Fukushima Daiichi accident requested as in the both 2nd Extraordinary Meeting Summary Report and 6th National report for further information.

2 SUMMARY

2.1 CURRENT SITUATION

As presented in the 6th National Report, Turkey has currently no nuclear power plant in operation, under construction or decommissioned. However, negotiations to build an NPP at a site named Akkuyu in Turkey started with the Russian Federation in February 2010 and concluded on May 12th, 2010 with the "Agreement between the Government of the Russian Federation and the Government of the Republic of Turkey on cooperation in relation to the construction and operation of a nuclear power plant at the Akkuyu site in the Republic of Turkey (Akkuyu Project Agreement)" based on a Build-Own-Operate (BOO) model. According to the Akkuyu Project Agreement, a Project Company named "Akkuyu Nuclear Power Plant Electricity Generation Joint-Stock Company (APC: Akkuyu Project Company)" was established under the Turkish jurisdiction on December 13th, 2010, which was later renamed as Akkuyu Nuclear JSC. This company is responsible for the construction and operation of four units of Water-Water Energetic Reactor (WWER) each with the capacity of 1200 MWe power. The nuclear regulatory body of Turkey, Turkish Atomic Energy Authority (TAEK), recognized APC as the "Owner" of the Akkuyu Project on February 7th, 2011. The Akkuyu Site on the Mediterranean coast was granted a site license for building an NPP in 1976 and this site was allocated to APC in 2011 as specified in the Akkuyu Project Agreement. APC finished the site investigations in Akkuyu for updating the site characteristics and parameters according to "Decree on Licensing of Nuclear Installations, 1983" and other related legislation. Updated information on the characteristics of the site was included in the Updated Site Report and the report was approved by TAEK. Site Parameters Report (Rev 2) submitted to TAEK for approval of site related design parameters in the December 2015. Upon approval of the report, APC will be able to apply to TAEK for a construction license.

The Agreement Between the Government of the Republic of Turkey and the Government of Japan on Cooperation for Development of Nuclear Power Plants and the Nuclear Power Industry in the Republic of Turkey" which was signed on 3rd of May 2013, aiming the construction and operation of an NPP comprising of four units of ATMEA-1 design in Sinop site, has come into force on 31st of July 2015 after its ratification by Turkish Parliament on 1st of April 2015 and after the completion of related diplomatic procedures. The Sinop NPP project will be implemented in the frame of this Agreement and also in the frame of the Host Government Agreement (HGA) which was attached to it. The HGA will be signed between the Turkish Government and the Project Company to be established in accordance with the IGA between Turkey and Japan. Currently, the recognized Owner for Sinop NPP project is EÜAŞ who will be a Partner to the Project Company with a share of up to 49%. After the establishment of Project Company, EÜAŞ is expected to relinquish its owner status so that the Project Company would take over and commence on the implementation of the Sinop NPP project.

2.2 CHANGES SINCE THE 6TH REVIEW MEETING OF NUCLEAR SAFETY CONVENTION

Since the 6th Review Meeting of Nuclear Safety Convention, Turkey has continued to update its nuclear regulatory infrastructure and developed its nuclear energy programme. This subchapter of Summary presents

developments and changes that have arisen since the previous National Report.

2016 Development Plan published by the Ministry of Development includes Measure 378 under chapter 2.2.2.16. titled “Energy” in sub section c “Policies and Measures” stating “Legal and institutional infrastructure in the field of nuclear energy will be strengthened in order to determine and verify the activities in the nuclear field are being implemented in a safe and secure way and an independent, strong and competent Nuclear Regulatory Authority shall be established”. In this context, a new Nuclear Energy Law with the inclusion of rearrangement of TAEK’s responsibilities and authorities shall be enacted by the end of 2016 with a reference to the Policy 791 of the 10th Ten Years Development Plan stating “Legal and institutional infrastructure in the field of nuclear energy shall be strengthened. In order to determine and verify the activities in nuclear field are being implemented in a safe and secure way an independent, strong and competent nuclear regulation and inspection system shall be established.”

There are also newly issued regulations since the 6th National Report of CNS. These regulations are the following:

- Regulation regarding Equipment Procurement Process and Approval of Manufacturers for Nuclear Facilities, 2015
- A Guide On Owner And Authorization Applications For Nuclear Installations, 2014
- Guide on the Construction Activities in Nuclear Installations that are Authorized as per the Authorization Stages, 2016

Amendment to the Convention on the Physical Protection of Nuclear Material, ratified by the Turkish Parliament on 10th of February 2015 and entered into force on 8th of July 2015.

Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was passed through the sub-committees and in the Agenda of Turkish Grand National Assembly. However, it could not be ratified before the elections in 2015. Due to change of Parliament Joint Convention has to be reassessed by the subcommittees of new parliament. However, it is expected to come in the agenda of the General Assembly soon.

Turkey is a signatory to the 2004 Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960, as Amended by the Additional Protocol of 28 January 1964 and by the Protocol of 16 November 1982. A new liability law in the field of nuclear energy has been drafted in full conformance with the 2004 Protocol and it is planned to be enacted in parallel with the ratification of 2004 Protocol by the end of 2016.

For successful licensing process of Akkuyu NPP, Turkey has plans under implementation for extending its human resources who will be employed for the licensing and inspection activities of the nuclear power plant. Besides these plans, technical support organizations (TSO) will be used when necessary. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014.

Turkey has also signed some agreements to receive support from experienced Regulatory Bodies. These agreements are:

- Arrangement Between The Nuclear Safety Authority of France (ASN) and Turkish Atomic Energy Authority (TAEK) for the Exchange of Technical Information and Co-operation in the Regulation of Nuclear Safety and Radiation Protection, 2014
- Memorandum of Understanding Between the Turkish Atomic Energy Authority and

the Nuclear Regulation Authority of Japan for Cooperation and Exchange of Information in the Field of Nuclear Safety and Radiation Protection, 2014

- Agreement Between the Hungarian Atomic Energy Authority (HAEA) and the Turkish Atomic Energy Authority (TAEK) for the Cooperation in the Field of Nuclear and Radiation Safety Regulation in the Peaceful Use of Nuclear Energy, 2014
- Memorandum of Understanding between Turkish Atomic Energy Authority and Radiation and Nuclear Safety Authority of Finland on Information Exchange Regarding Regulation and Licensing of Nuclear Power Plants, 2015

According to Regulations, the operator of a facility has to prepare an Environmental Impact Assessment (EIA) Report at the planning stage which should be submitted to the Ministry of Environment and Urbanization (MoEU). The MoEU evaluates the report for the feasibility and environmental aspects of the proposed installation, and grants permission to the operator to carry out its project if the report is found satisfactory. Nuclear Installations fall into the category of facilities which require this authorization. NPPs should obtain an affirmative decision on EIA from the MoEU as a prerequisite to any license and so EIA affirmative decision is prerequisite before site license. The EIA Report of Akkuyu NPP has been submitted to MoEU in July 2013 and affirmative decision was given December 2014.

APC finished the site investigations in Akkuyu for updating the site characteristics and parameters according to "Decree on Licensing of Nuclear Installations, 1983" and other related legislation. Updated information on the characteristics of the site was included in the Updated Site Report (USR) and the USR submitted to TAEK in May 2012. Review and assessment conducted by Site Group, Advisory Committee on Nuclear Safety (ACNS) and IAEA and positive decision for USR was given in December 2013. Site Parameters Report (SPR) submitted in November 2014. The Updated SPR (Rev 2) that addresses the site license validity was submitted to TAEK in December 2015.

In October 2012, Turkey requested to host an Integrated Nuclear Infrastructure Review (INIR) mission and mission was completed in November 2013. Turkey prepared a detailed national action plan to respond to INIR recommendations and then on November, 2014 initiated to establish an integrated working plan (IWP) with IAEA. The first IWP prepared in November and 2nd one in November 2015.

2.3 ACTIONS TAKEN IN THE LIGHT OF THE FUKUSHIMA DAIICHI ACCIDENT

The Contracting Parties to the CNS convened in Vienna for the 2nd Extraordinary Meeting from August 27th to 31th, 2012 due to discuss and share the information and ideas about the accident at the Japanese nuclear power plant Fukushima Daiichi. During this meeting, the discussions were performed in six topical areas (external events, design issues, severe accident management and recovery, national organizations, emergency preparedness and response, international cooperation) regarding the implementation or planned measures for improving nuclear safety and also the experience gained in the light of the Fukushima accident. In the summary report of the meeting, it is stated that the Parties will place the implementation of their measures to improve nuclear safety in their county report.

Even though Turkey has currently no nuclear power plant in operation, an NPP project at the Akkuyu site, which was granted with license in 1976, was initiated in 2010 to build four units

of 1200 MWe WWER. The preliminary safety analysis of reference plant (Novovoronezh NPP II) and some additional technical documents related to WWER-1200 design for the Akkuyu NPP Project was also presented to TAEK by APC. Regarding the aforementioned studies and documents, the technical issues arising from the Fukushima accident are identified and discussed below.

Turkey also participated voluntarily in "Stress Tests" activities of European Commission in year 2013. In mid-2013, the national report was submitted to European Nuclear Safety Regulators Group (ENSREG) and the report was published in ENSREG web site at the end of 2013. Since, the "Stress Test Report" of Turkey was based on early assumptions on NPP to be built in Akkuyu, Turkey stated its intention on updating the report based on actual data of Akkuyu NPP when the data is available. Turkey has recently requested the APC to update their input on Stress Test Report. After the APC provide necessary information, Turkey will finalize its report and resubmit to the ENSREG.

2.3.1 SITING AND EXTERNAL EVENTS

After Akkuyu Site was allocated to APC in 2011 as specified in the Akkuyu Project Agreement, APC started site investigations in Akkuyu for updating the site characteristics and parameters not only in accordance with the relevant Turkish regulations but also IAEA safety standards and lessons learned from Fukushima. Besides that, the APC stated in his official reports that Akkuyu NPP design will be developed in compliance with up-to-date requirements to safety and ability of the plant to withstand earthquakes that are established by European Utility Requirements (EUR) and IAEA. For example, the seismological and geological studies, tectonics of the site have been investigated in compliance with TAEK regulations and also with the IAEA Safety Guide SSG-9. Similarly, comprehensive coastal flooding investigations were conducted including tsunamis, seiches, storm surges, tides, waves and sea level rise due to global warming. The extreme meteorological hazards at Akkuyu including storms, heavy precipitation (impacting hydrological events), extreme temperatures (air and water), lightning and small tornadoes and waterspouts were also investigated. For all these hydrological and meteorological hazards, investigations and analysis, requirements of TAEK regulations and IAEA Safety Guide SSG-18 have been followed. For instance, it is requested from the APC to determine the maximum probable tsunami value for the time interval of 10,000 years. The human induced hazards have been evaluated using the IAEA Safety Guide NS-G-3.1.There is also a criteria related to aircraft crashes in TAEK's Guide on Specific Design Principles, 2012 of which the impact mass and velocities are defined for both design basis and beyond-design basis accident (BDBA). Based on this guide, the analysis for the different aircraft crashes shall be submitted to TAEK during the construction license phase.

In addition, the APC states that the High Confidence of Low Probability of Failure capacity of Akkuyu NPP will be of at least 1.4 times the design basis earthquake ground motion. This is consistent with the requirement of the EUR, Sec. 2.4.6.7 "Seismic margin assessment," i.e., to demonstrate margin of at least 1.4 times the design basis earthquake ground motion.

2.3.2 LOSS OF POWER SUPPLY FOLLOWING BEYOND DESIGN BASIS EXTERNAL EVENTS

At the Fukushima accident, the loss of offsite power (due to the earthquake) and onsite AC power (due to the tsunami), combined with the rapid discharge of the DC batteries caused to a complete station blackout, which in turn

led to fuel overheating, damage and melting. The WWER-1200 design to be built in Akkuyu Site will contain both passive (passive hydro-accumulators, system for passive heat removal, etc.) and active safety systems that may be desirable to deal with the station blackout scenario without relying on external intervention. The performance and combination of these systems will be evaluated during the construction license phase including risk assessment, taking into account also the possible failure modes of the passive systems upon occurrence of the initiating external event.

Design basis site parameters such as design basis earthquake, maximum probable tsunami height, etc., the housing and elevations of the emergency diesel generators (DG) and their fuel, related switch gear, etc. will also be evaluated during the construction phase for each unit separately regarding the common cause vulnerabilities in order to preserve onsite AC power in case of an external event.

2.3.3 HYDROGEN MANAGEMENT

During the Fukushima accident, deficient fuel cooling resulted in overheating of the fuel, enabling rapid oxidation and generation of large amounts of hydrogen, which ultimately led to the explosion/destruction of the reactor buildings at Units 1 and 3, and possibly fires at Unit 4. However, the exact mechanism of hydrogen accumulation in the reactor buildings has not been ascertained at this time. The WWER-1200 design to be built in Akkuyu Site will contain a system for control of the concentration and emergency removal of the hydrogen in the containment. This system includes passive autocatalytic recombiners that will eliminate the possibility of detonation of the hydrogen mixtures in the containment in all considered BDBA. Also, there will be a system for hydrogen concentration monitoring inside containment, providing continuous monitoring of hydrogen volumetric concentration in the containment within the range from 0 to 25%.

2.3.4 CONTAINMENT

During the Fukushima accident**,** due to the station blackout, the operators had to vent the containment to prevent containment over-pressurization. Some vented gases leaked into the reactor building, which had no ventilation (again due to the station blackout), resulting in hydrogen accumulation and ultimately explosion/destruction of the reactor buildings at Units 1 and 3. In The WWER-1200 design to be built in Akkuyu Site, Primary circuit equipment will be housed in double containment. There will be the Annulus Passive Filtering System for removal and controlled purification of leaks flowing to internal containment via the annulus in all operational occurrences, including design basis accident (DBA) and BDBA related to failures of annulus active ventilation systems.

2.3.5 SPENT FUEL POOLS

At the Fukushima accident, very large radioactivity releases originated from the spent fuel pools (SFP). The location of the SFPs exposed them to damage from hydrogen explosions in the reactor buildings at Units 1, 3 and possibly 4. Unlike the traditional PWRs, in The WWER-1200 design to be built in Akkuyu Site, SFP will be located inside the actual containment. The residual heat from the SFP shall be removed by the SFP cooling system of which pumps shall be also supplied with electrical power by the emergency DG. Then, the heat is transferred to the component cooling system, from where to the ultimate heat sink. In case of SFP cooling system failure residual heat removal may be provided by emergency and planned primary circuit cool-down system. If cooling water to heat exchangers is not available SFP heat removal is

provided by evaporating water in the pools and water supply from the spray system, passive hydro accumulators or SFP purification system tanks. Reliable power supply to the SFP purification pumps may be provided from the stand-by unit DG station.

2.3.6 SEVERE ACCIDENT MANAGEMENT

Beside Level-1 probabilistic safety assessment, Level-2 probabilistic safety analyses will also be performed for Akkuyu NPP project, in order to determine a strategy for the severe accident management and to justify sufficiency of available and planned engineering features, which will be used for severe accident management. Based on the results of the analyses, it is foreseen to prepare the severe accident management guides and to implement measures related to the accident management such as:

- Ensuring reliable communication in BDBA conditions (both on the NPP site and crisis centers),
- Improvement of the habitability of places where the essential personnel located (mainly NPP units' control rooms),
- Including scenarios stemming from an event or accident at a unit, which may affect the other units (multi-unit aspects).

The technical means of safety systems (active and passive), used in not only Akkuyu NPP Project but also all reactor designs, is to reduce the probability of core damage. Nonetheless, an event might be postulated in the design within the framework of multilevel protection concept involving core damage and escape of melt from the reactor vessel. To mitigate the consequences of such an accident, the WWER-1200 design that will be built in Akkuyu Site is incorporated with a catcher for confining the corium beyond the reactor vessel boundaries. The corium catcher is intended for retaining liquid and solid fragments of destructed core, parts of reactor vessel, and reactor internals in case of a severe accident involving core melting.

2.3.7 EMERGENCY RESPONSE TO BEYOND-DESIGN-BASIS EXTERNAL EVENTS

There have been still concerns that the operator of the Fukushima could not ensure proper staffing of the plant throughout the accident, since a significant fraction of the local staff died or was injured or run away after the earthquake ensuing tsunami. For the Akkuyu NPP Project, the emergency plan and the severe accident management guidelines will be elaborated at the next project stage. Taking into account the lessons learnt after the Fukushima accident in Japan, some requirements were developed for severe accident management and measures for emergency preparedness plans were identified. These requirements and measures will be considered for further investigations, included in the technical specifications and implemented for Akkuyu NPP design.

The National Disaster Response Plan, which is the highest-level overarching plan that covers all hazards, has been issued by the Disaster and Emergency Management Presidency of Prime Ministry (AFAD). The National Disaster Response Plan is modular and consists of 28 service groups. Each service group is dedicated to a service, which should be provided during disasters and emergencies. The service group plans were also prepared and approved.

The National Radiation Emergency Plan (NREP) was prepared by the national regulatory body Turkish Atomic Energy Authority, in collaboration with AFAD. NREP is an event-type plan according to the National Disaster Response Plan and is which reflects the IAEA's

most recent approach on EPR (GSG-2, EPR-NPP Public Protective Actions-2013, GSR Part 7). The requirements that are already set forth in the national legislation are elaborated in NREP. Experience from the Fukushima Accident was reflected in this plan (i.e. the size of the emergency planning zones and distances, operational concepts including time objectives, etc). Generic criteria that establish basis for performance of protective actions and corresponding operational intervention levels are included in the plan. The response organization and emergency facilities (including the ones used for informing the public) are defined in the plan.

3 EXISTING NUCLEAR INSTALLATIONS (ARTICLE 6)

Turkey has currently no nuclear power plant in operation, under construction or decommissioned. However, negotiations to build an NPP at a site named Akkuyu in Turkey started with the Russian Federation in February 2010 and concluded on May 12th, 2010 with the Akkuyu Project Agreement based on a BOO model. According to the Akkuyu Project Agreement, "Akkuyu Nuclear Power Plant Electricity Generation Joint-Stock Company (APC: Akkuyu Project Company)" was established under the Turkish jurisdiction on December 13th, 2010, which was later renamed as Akkuyu Nuclear JSC. This company is responsible for the construction and operation of four units of Water-Water Energetic Reactor, WWER each with the capacity of 1200 MWe power. The nuclear regulatory body of Turkey, TAEK recognized APC as the "Owner" of the Akkuyu Project on February 7th, 2011.

The Akkuyu Site on the Mediterranean coast was granted a site license for building a Nuclear Power Plant (NPP) in 1976 and this site was allocated to APC in 2011 as specified in the Akkuyu Project Agreement. APC finished the site investigations in Akkuyu for updating the site characteristics and parameters according to "Decree on Licensing of Nuclear Installations, 1983" and other related legislation. Updated information on the characteristics of the site was included in the Updated Site Report and approved by TAEK. Site Parameters Report (Rev 2) submitted to TAEK for approval in the December 2015. Upon approval of the report, APC will be able to apply to TAEK for a construction license.

The Sinop NPP is the second nuclear power plant project in Turkey. Within this context, "Agreement between the Government of Republic of Turkey and the Government of Japan on Cooperation for Development of Nuclear Power Plants and the Nuclear Power Industry in the Republic of Turkey" was signed on May 3rd, 2013, aiming the construction and operation of an NPP comprising of four units of ATMEA-1 design in Sinop site. Based on this agreement a Project Company will be established and further details of the project will be determined by Host Government Agreement, which will be signed between the SPC and the Turkish Government in later stage.

Although, Turkey has no nuclear power plant, there are two research reactors and a pilot fuel fabrication plant on experimental level. These facilities are outside the context of CNS. The governmental research center Çekmece Nuclear Research and Training Centre (ÇNAEM), which is one of the three affiliated institutions of TAEK, co-operates with universities and other scientific and research institutes for the development and application of nuclear science and technology for peaceful uses of atomic energy. ÇNAEM commissioned a 1 MW research reactor (TR-1) in 1962 for both research and production of isotopes for industrial and medical purposes. It was operational from 1962 to 1977, and has now been dismantled. A pool type 5 MW TR-2 reactor was later built in the same building and has been operated at 5 MW between 1984 and 1994 for irradiation purposes and operated at low power levels between 1995 and 2009 due to the fact that an update of conducting seismic evaluation studies of the reactor building are required. In 2013, the project on strengthening the reactor building is completed. An updated SAR is being prepared. Figure 1 shows control room and reactor pool of the TR-2 reactor.

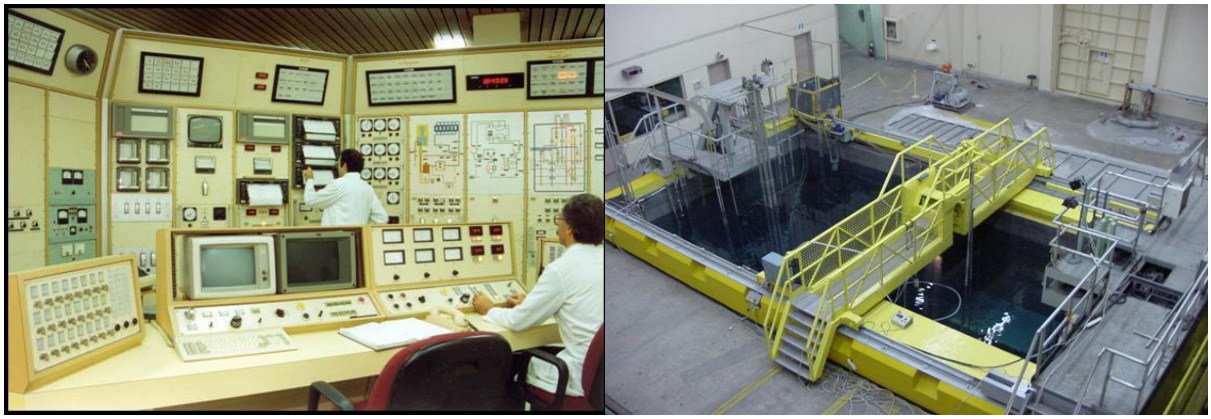

Figure 1.TR-2 Research Reactor

The second research reactor in Turkey, ITU TRIGA MARK II reached its first criticality on March 11th, 1979. It is a pool-type, light water cooled and graphite-reflected reactor. ITU TRIGA MARK II Reactor is capable of steady-state operation at power levels up to 250kW or pulsing mode operation where powers as high as 1200MW are achieved for about 10msec. Figure 2 shows some pictures of the TRIGA MARK II.

Figure 2.ITU TRIGA MARK II Research Reactor

4 LEGISLATIVE AND REGULATORY FRAMEWORK (ARTICLE 7)

4.1 ESTABLISHING AND MAINTAINING A LEGISLATIVE AND REGULATORY FRAMEWORK

4.1.1 TURKISH REGULATORY STRUCTURE

Turkish regulatory structure is composed of laws, decrees, regulations, guides and codes and standards. The hierarchical pyramid of Turkish regulatory structure is given in Figure 3. Within this structure, the current legislative and regulatory framework of Turkey is consistent with international conventions and treaties, and IAEA safety requirements in most of the aspects of nuclear safety and security.

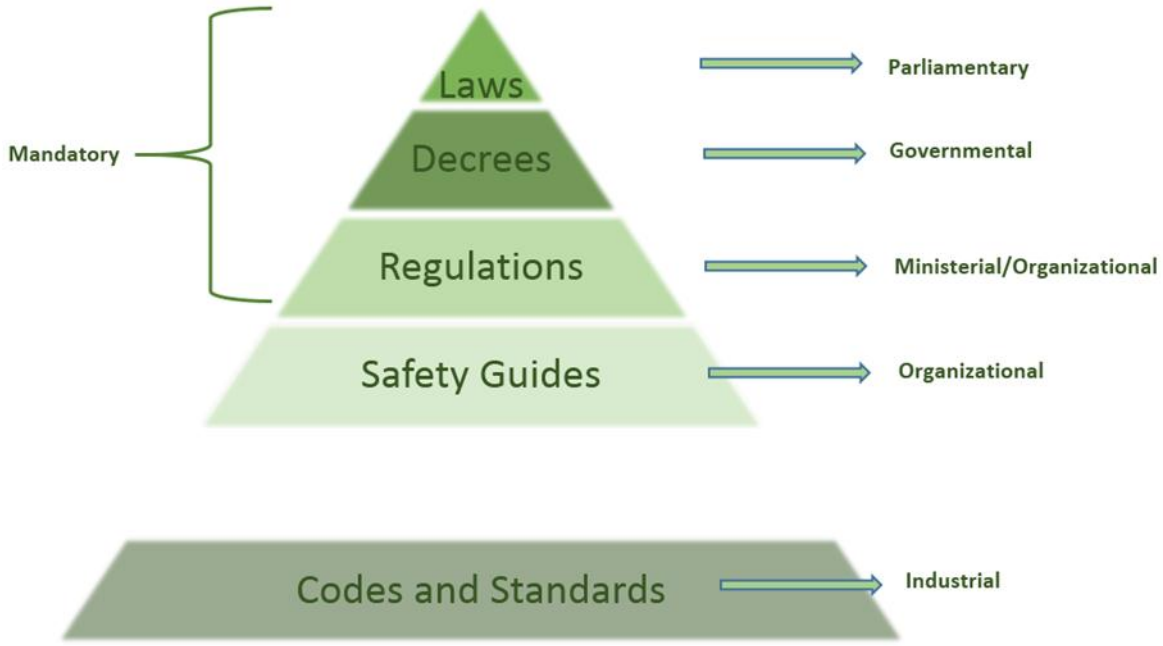

Figure 3.Hierarchy of Regulatory Documents in Turkey

Turkey's legislative and regulatory framework ensures that nuclear materials and facilities are utilized and nuclear activities are performed with proper consideration for health, safety, security and protection of the people and environment. As a non-nuclear weapon state party to the NPT, Turkey has established a system of accountancy for and control of nuclear materials based on The Agreement between Turkey and the IAEA for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (Safeguards Agreement) and Protocol Additional to The Agreement between Turkey and the IAEA for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons (Additional Protocol). Turkey has received an IAEA Safeguards Advisory Service Mission (ISSAS) in June 2010 to review this system and revisions with respect to the Safeguards Agreement and Additional Protocol. Turkey will receive an International Physical Protection Advisory Service (IPPAS)

Mission of the IAEA between 10 and 21 October 2016.

Turkey is also a party to the Convention on Physical Protection of Nuclear Materials. Both regulations, Nuclear Material accounting and Control (NMAC) and Physical Protection, have been revised in 2012 to reflect latest developments in the country and in international framework.

The main Turkish legislative framework regulating nuclear installations consists of the "Law on Turkish Atomic Energy Authority, Law No.2690, 1982" which regulates nuclear safety, security and radiation protection; the "Environmental Law" which regulates environmental impact of these facilities; the "Penal Law", which defines nuclear and radiological crimes and penalties; and the "Law on Electricity Market" which regulates electricity production licenses. By these laws TAEK, Ministry of Environment and Urbanisation (MoEU) and Energy Market Regulatory Authority (EMRA) are regulatory bodies. There are several other regulatory bodies such as Ministry of Transportation, Ministry of Health etc., which indirectly regulates NPPs in regard of other issues.

According to the Decision on Turkey's National Programme for the Adoption of the EU Acquis Implementation, Coordination and Monitoring, enacted by the Council of Ministers' decision (11.10.2008, No: 2008/14481) it is indicated that nuclear law shall be in line with EU standards and provide a high level of nuclear safety.

2016 Development Plan (23.01.2016, O.G. No: 29602) published by the Ministry of Development includes Measure 378 under chapter 2.2.2.16. titled "Energy" in sub section c "Policies and Measures" stating "Legal and institutional infrastructure in the field of nuclear energy will be strengthened In order to determine and verify the activities in the nuclear field are being implemented in a safe and secure way an independent, strong and competent Nuclear Regulatory Authority shall be established. In this context, a new Nuclear Energy Law with the inclusion of rearrangement of TAEK's responsibilities and authorities shall be enacted by the end of 2016 " with a reference to the Policy 791 of the 10th Ten Years Development Plan stating "Legal and institutional infrastructure in the field of nuclear energy shall be strengthened. In order to determine and verify the activities in nuclear field are being implemented in a safe and secure way an independent, strong and competent nuclear regulation and inspection system shall be established."

The draft Nuclear Energy Policy Paper defines the preparation of strategies for nuclear safety to be implemented by all stakeholders in Turkey's nuclear power program:

- Protection of the workers, public and environment from harmful effects of ionising radiation from nuclear energy and radioisotope applications and avoiding unnecessary burden on future generations.
- The legislative and regulative framework for licencing, inspection and enforcement actions on nuclear facilities will be established and implemented in accordance to IAEA safety standards.
- An independent and effective Nuclear Regulatory Authority shall be established in order to strengthen the regulation and implementation of nuclear safety.
- The roles and responsibilities of all stakeholders for licencing, inspection and enforcement actions on nuclear facilities will be explicitly defined in the regulatory framework.

- Effective participation and active contribution will be provided to international conventions on nuclear safety which Turkey is party to.
- Innovative technologies and developments with good practices on nuclear safety shall be transferred to nuclear energy applications by close follow-up from stakeholders.

4.1.2 INTERNATIONAL LEGAL INSTRUMENTS

Turkey is a party to the following international legal instruments for safe, secure and responsible use of nuclear energy and has adhered to their provisions:

a) Convention on Early Notification of a Nuclear Accident signed on September 28th, 1986 published on September 3rd, 1990 in Official Gazette No: 20624 (entry into force February3rd, 1991) with reservation: [January 3rd, 1991] "Turkey hereby declares that in accordance with paragraph 3 of the article 11 of the Convention on Early Notification of a Nuclear Accident, it does not consider itself bound by the provisions of paragraph 2 of article 11, thereof."

b) Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. September 28th, 1986 published on September 3rd, 1990 in Official Gazette No: 20624 (Entry into force February 3rd, 1991) with reservation: [January 3rd, 1991] "In conformity with the article 8 paragraph 9 of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, Turkey does not consider itself bound by article 8 paragraph 2(a) with regard to the immunity from civil proceedings, by paragraph 2(b) concerning exception from taxation, duties or other charges for personnel of the assisting party. "Turkey hereby declares that in accordance with article 10, paragraph 5 of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, it does not consider itself bound by the provisions of paragraph 2 article 10."Turkey hereby declares that in accordance with paragraph 3 of the article 13 of the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, it does not consider itself bound by the provisions of paragraph 2 of article 13, thereof."

c) Convention on Nuclear Safety September 24th, 1994 published on January 14th, 1995 in Official Gazette No: 22171(entry into force October 24th, 1986).

d) Convention on Physical Protection of Nuclear Materials signed on August 23rd, 1983 entered into force February 8th, 1987 (with reservation: [August 23rd, 1983] "Turkey, in accordance with Article 17, Paragraph 3, of the Convention does not consider itself bound by Article 17, Paragraph 2 of the Convention.". Turkish internal legal procedure is continuing for the ratification of the Amendment.

e) Convention on Third Party Liability in the Field of Nuclear Energy of July 29th, 1960, as amended by the Additional Protocol of January 28th, 1964 and by the Protocol of November 16th, 1982 signed on July 29th, 1960 in force.

f) The Agreement between Turkey and the IAEA for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons signed on June 30th, 1981 entered into force September 1st, 1981.

g) Protocol Additional to The Agreement between Turkey and the IAEA for the Application of Safeguards in Connection

with the Treaty on the Non-Proliferation of Nuclear Weapons signed on July 6th, 2000 entered into force July 17th, 2001.

h) Revised Supplementary Agreement concerning the provision of Technical Assistance by the IAEA signed and entered into force on November 11th, 1980.

i) Treaty on the Non-Proliferation of Nuclear Weapons signed on January 28th, 1969 ratified on April 17th, 1980.

j) Amendment to the Convention on the Physical Protection of Nuclear Material, ratified on 10th of February 2015 (entry into force July 8th 2015) (with reservation: "It is the understanding of the Republic of Turkey that the term international humanitarian law in paragraphs (a) and (b) of article 2(4) of Convention on the Physical Protection of Nuclear Material, refers to the legal instruments to which Turkey is already party. The article should not be interpreted as giving a different status to the armed forces and groups other than the armed forces of a state as currently understood and applied in international law and thereby creating new obligations for Turkey."

According to the Decision on Turkey's National Programme for the Adoption of the EU Acquis Implementation, Coordination and Monitoring, enacted by the Council of Ministers' decision dated October 11th, 2008 and numbered 2008/14481, Participation in the Joint Convention on Spent Fuel and Radioactive Waste Management Safety was indicated. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management was passed through the sub-committees and in the Agenda of Turkish Grand National Assembly to be ratified before the elections in 2015. Due to change of Parliament because of the elections it has to be reassessed by the subcommittees. However, it is expected to come in the agenda of the General Assembly soon.

4.1.3 RELATED GOVERNMENTAL BODIES WITH REGULATORY FUNCTIONS ON NUCLEAR ACTIVITIES

There are a number of organizations who directly or indirectly involved in the implementation of the nuclear power programme in Turkey (Figure 4).The responsibilities of the Governmental bodies with regulatory functions are given in the following subchapters.

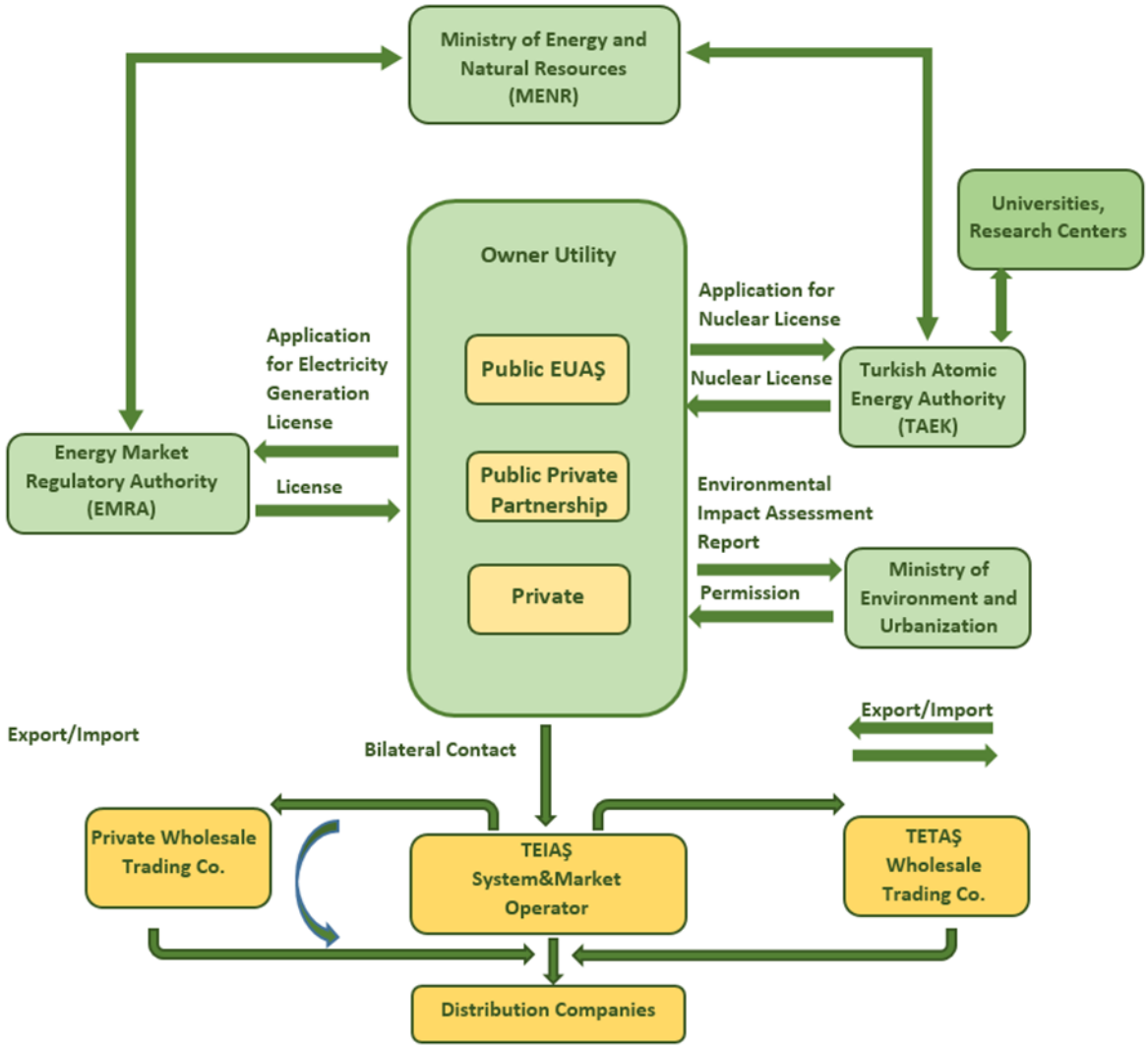

Figure 4.Organizations Taking Part in Turkish Nuclear Energy Program

4.1.4 TURKISH ATOMIC ENERGY AUTHORITY AS NUCLEAR REGULATORY BODY

TAEK is established as the nuclear regulatory body by the Law No.2690. TAEK regulates all nuclear and radiation activities and facilities in Turkey. The Law No.2690 gives authority and responsibility for ensuring the nuclear safety and nuclear security by licensing and inspecting such activities and facilities. TAEK also coordinates and supports research and development activities in nuclear field.

4.1.5 PRIME MINISTER

Atomic Energy Commission (AEC) which was responsible all nuclear activities in Turkey was established under Prime Minister's authority with Law No.6821 of August 27th, 1956 and its successor TAEK which replaced AEC with Law No.2690 of July 13th, 1982 is administratively attached to the Prime Minister's Office, although this duty has been carried out by Ministry of Energy and Natural Resources (MENR) since 2002.

4.1.6 MINISTRY OF ENERGY AND NATURAL RESOURCES

This ministry is the major competent authority in the national energy sector. It is responsible for the preparation and implementation of energy policies, plans and programs in co-ordination with its subsidiaries, related institutions and other public and private entities. In November 2002, the Government of Turkey re-organized the relation between several public agencies and ministries. According to this re-organization, TAEK is affiliated to the MENR.

4.1.7 MINISTRY OF ENVIRONMENT AND URBANISATION

MoEU establishes principles of national policy, related plans and programs for protection and improvement of the environment, and the prevention of environmental pollution. In concrete terms, the MoEU's responsibilities include ensuring the most proper and effective use and protection of land, the protection and improvement of the natural plant and animal habitat and the prevention of environmental pollution. These responsibilities are being carried out by the MoEU in the frame of the Regulation on Environmental Impact Assessment, 1997. According to this Regulation the operator of a facility has to prepare an Environmental Impact Assessment (EIA) Report at the planning stage which should be submitted to the MoEU. The MoEU evaluates the report for the feasibility and environmental aspects of the proposed installation, and grants permission to the operator to carry out its project if the report is found satisfactory. Nuclear Installations fall into the category of facilities which require this authorization. NPPs should obtain an affirmative decision on EIA from the MoEU as a prerequisite to any license.

4.1.8 NUCLEAR ENERGY PROJECT IMPLEMENTATION DEPARTMENT

According to the law on "Organization and Duties of Ministry of Energy and Natural Resources" numbered 3154 and approval date of 19/2/1985 with amendment on 11/10/2011, Nuclear Energy Project Implementation Department (NEPIO) is assigned to coordinate activities within the related stakeholders in order to develop legislative framework, human resources, training, industry and technology fields in relation to the implementation of NPP projects and to make or to assign studies in these fields; to carry out studies to inform the public regarding nuclear energy and nuclear facilities and to support, to organize and to participate in the task within the field of scientific meetings such as national and international congresses, symposia, seminars, workshops. The organization of NEPIO under MENR is established in compliance with recommendations of IAEA Guide titled "Milestones in the Development of a National Infrastructure for Nuclear Power" with No. NG-G-3.1.

4.1.9 THE ELECTRICITY GENERATION COMPANY

The Electricity Generation Company (EÜAŞ) is a state-owned company and the largest electricity generation company in Turkey. The responsibility of EÜAŞ is to operate the existing hydraulic and thermal power plants under its jurisdiction, running the newly built hydraulic power plants maintenance, repair and rehabilitation of the power plants under operation. EÜAŞ has been given the role as state electricity generation entity for nuclear power plants in case the nuclear power plant will be owned and operated by the state (as whole owner or shareholder). An application was made by Electricity Generation Company (EÜAŞ) to TAEK and EÜAŞ was recognised as an

owner of Sinop NPP in August 2012. Site characterization of Sinop Site is still in progress.

4.2 NATIONAL SAFETY REQUIREMENTS AND REGULATIONS

Regarding nuclear safety and radiation protection, there are two decrees under the Law No.2690:

1) Decree on Licensing of Nuclear Installations, 1983
2) Decree on Radiation Safety, 1985

Further details on safety principles are addressed in regulations. There are currently 18 regulations, directly or indirectly addressing safety of nuclear power plants (See Annex II).

Rules and procedures related to the licensing of nuclear installations are laid out in the "Decree on Licensing of Nuclear Installations, 1983", entered into force in 1983. The decree defines permits and licenses to be obtained, requirements for applications to these permits and licenses, including lists of documents to be submitted, review and assessment procedures, the authorizing entities within TAEK for each authorization, approval mechanisms for modifications during construction and operation, and authorizes TAEK for inspecting the installations throughout their lifetime and enforcing penalties such as limiting, suspending and revoking the licenses.

Law No.2690, the Decree on Licensing of Nuclear Installations, 1983, the Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012 and the regulations constitute the basis of the legal framework of nuclear safety of nuclear installations in Turkey.

Rules and procedures for accounting for and control of nuclear materials are described in the "Regulation on Nuclear Material Accounting and Control, 2012", which satisfy the requirements of the Safeguards Agreement with the IAEA. This regulation has been prepared in compliance with the additional protocol. The national aspects of Convention on Physical Protection of Nuclear Material have been implemented in the "Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities, 2012". This regulation has been prepared incompliance with INFCIRC 225/Rev.4 and some provisions of INFCIRC 225/Rev5. This regulation is in the process of an update for a full compliance with INFCIRC 225/Rev5 and for resolving some issues regarding domestic procedures.

There are several regulations associated with nuclear safety. Suitability of NPP sites is addressed in the "Regulation on Nuclear Power Plant Sites, 2009". Basic requirements on design of an NPP are laid out in the "Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" and on construction, commissioning, operation and decommissioning of an NPP in the "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008". Nuclear and radiological emergencies are covered in the "National Regulation on Nuclear and Radiological Emergencies, 2000". This regulation only covers the roles and responsibilities of governmental authorities in case of a radiation emergency. For requirements on emergency preparedness and response, IAEA Safety Requirement GS R-2 is addressed. National Radiological Emergency Plan (NREP) has been prepared and it is expected to be approved by Disaster and Emergency Supreme Board in the third quarter of 2016.

The regulations "Regulation on Radioactive Waste Management, 2013" and "Regulation on Clearance in Nuclear Facilities and Release of Site from Regulatory Control, 2013" cover clearance and release of sites from regulatory

control and radioactive waste management in nuclear installations.

"Regulation Regarding Equipment Procurement Process and Approval of Manufacturers for Nuclear Facilities, 2015" establishes the provisions for; the procurement process of all equipment used in nuclear facilities including the permits necessary to be obtained by the Owner to initiate the procurement process and issues regarding approval of manufacturers taking part in the procurement process of equipment important to safety; as well as regulatory inspections and sanctions to be implemented in the procurement process.

Another important regulatory document is the "Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012", which lays out the rules for establishing a licensing basis for nuclear power plants.

4.3 SYSTEM OF LICENSING

In Turkey, nuclear installations are licensed by TAEK regarding nuclear safety, security and radiation protection issues. Licensing procedure is initiated by the applicant to be recognized as the "Owner". Licensing process for an NPP comprises three main stages in succession: Site License, Construction License and Operating License. There are several permits functioning as hold points during the licensing process. These are limited work permit, commissioning permit, permit to bring fuel to site, fuel loading and test operations permit for operating license. For each authorization, documents required for review and assessment of TAEK are defined in the "Decree on Licensing of Nuclear Installations, 1983". There is no design approval authorization in Turkey. The Decree also requires the owner to apply for authorization of TAEK for every modification that may have an impact on the safety of nuclear installation. Authorization process for decommissioning stage is not defined in the Decree. This issue will be addressed in Draft Nuclear Energy Law.

Licensing approach of TAEK is defined in the "Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012", which lays out the rules for establishing a licensing basis for NPPs. These rules state that the issues insufficiently addressed by existing Turkish regulations on nuclear safety shall be covered by requiring compliance with the regulations of the vendor or designer country and the IAEA safety documents, particularly, safety fundamentals and safety requirements. For remaining issues, third party country laws, regulations and standards are referenced. The directive also requires the Applicant to submit the regulatory body a reference plant of the proposed design for facilitating the licensing process. Directive is established in accordance with the principles laid out in "Licensing the First Nuclear Power Plant, INSAG-26" document of IAEA.

This Directive is being implemented for the Akkuyu Project. A list of applicable regulations, guides and standards has been determined by the owner according to Article 6 of "Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012". AEC of TAEK has approved the list on November 2, 2012. The revised list (Rev.2) is approved on November 14, 2014. "List of Licensing Basis for Akkuyu Nuclear Power Plant" is mainly composed of Turkish regulations, IAEA Safety Fundamentals and Requirements and Russian Federation Regulations. Also standards and guides of Turkey and Russian Federation exist in the List. Novovoronezh-II NPP in Russian Federation is approved as the reference plant for Akkuyu NPP by AEC of TAEK according to Article 7 of the Directive on Determination of Licensing

Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012.

4.4 SYSTEM OF REGULATORY INSPECTION AND ASSESSMENT

Regulatory inspection and enforcement activities cover all areas throughout the lifetime of a nuclear installation. The main philosophy for the regulatory inspection is "Trust and Verify". However until trust is established this is achieved by planning the overall approach in scope and content of the inspection to be conducted, not only limited to the authorized organization but also to include its contractor and supplier chains. TAEK conducts inspections to satisfy itself that the authorized organization is in compliance with the conditions set out in the authorization and applicable regulations, based on the "Regulation on Nuclear Safety Inspections and Enforcement, 2007". Enforcement actions may be taken, as deemed necessary by TAEK in the event of deviations from, or non-compliance with conditions and requirements. Regulatory inspection includes a range of planned and reactive inspections over the lifetime of a nuclear installation and inspections of other relevant parts of the operator's organization and contractors/suppliers to ensure compliance with regulatory requirements. The methods of inspection include examination and evaluation of all records and documentation, and surveillance, monitoring, auditing and interviewing of personnel and management, as well as performing of actual tests and measurements in all phases of the installation. In addition to TAEK staff, outside local or foreign services may be procured for specific inspection tasks for the purpose of pre-evaluation and obtaining data where necessary. Inspections on nuclear security are performed according to the "Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities" which was issued in 2012.

Studies on updating "Regulation on Nuclear Safety Inspections and Enforcement" and ""Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities" is ongoing.

4.5 ENFORCEMENT OF APPLICABLE REGULATIONS AND TERMS OF LICENSES

The Decree on Licensing of Nuclear Installations, 1983 authorizes TAEK to grant, decline, limit the scope, suspend and revoke the licenses. TAEK may put a formal request to the Prime Minister to close down a nuclear installation. In case of regulation violations, TAEK takes into account importance, urgency and seriousness of the violations in regard to nuclear safety for the imposed enforcement. All decisions and actions by TAEK may be challenged by any interested party through the legal system of Turkey. It is explicitly declared in the Decree on Licensing of Nuclear Installations, 1983 that nuclear installations cannot be operated without a valid license.

Law No.5237 "Penal Law" has some crimes defined regarding nuclear energy and radiation. A study to assess their adequacy to satisfy the provisions of Convention on Physical Protection of Nuclear Materials and International Convention for the Suppression of Acts of Nuclear Terrorism other instruments and incorporation of the required crime definitions into Penal Law is being conducted.

5 REGULATORY BODY (ARTICLE 8)

5.1 ESTABLISHMENT OF THE REGULATORY BODY

TAEK as the Regulatory Body of Turkey undertakes all the regulatory activities concerning nuclear and radiation safety together with the coordination and support of research and development activities in nuclear field.

TAEK was established by the Law No.2690 as a government body reporting to the Prime Minister. TAEK has been affiliated with the MENR since 2002.

Law No.2690 defines the duties and responsibilities of the TAEK as follows:

a) To determine the basis of the national policy and the related plans and programmes in connection with the peaceful utilization of atomic energy for the national interest and to submit them to the Prime Minister for approval; to do all kinds of research, development, studies and activities and have them done for the utilization of atomic energy in the national scientific, technical and economic development and to coordinate and support such activities in this field.

b) To determine the general principles to be complied in all kinds of prospecting, exploiting, purification, distribution, import, export, trade, transport, use, transfer and storage of nuclear raw material, special fissionable material and other strategic materials used in nuclear fields and to advise and to cooperate thereon.

c) To establish research and training centers, units, laboratories, test centers and pilot plants without energy production purposes located in the necessary places of the country or have them established, and to operate them or have them operated; to carry out the activities aiming the localization of nuclear technology; to propose the establishment of processing, purification and any other facilities related to the fuel cycle.

d) To establish and operate the radioisotope production, quality control, scaling and distribution facilities.

e) To set out the principles and provisions for protection against the hazards of ionizing radiation in the activities performed using radiation equipment, radioactive materials, special fissionable materials and such ionizing radiation sources and to determine the limits of liability.

f) To grant license as a basis for authorization to public or private bodies or persons who possess, utilize, import or export, transport, store and trade the radioactive materials and radiation equipment and to inspect them regarding radiation protection; to enforce the insurance liability for these activities; to suspendor revoke the license permanently or temporarily, if in contrary to the provisions of the radiation regulations; to decide the closure of authorized organization if it deems necessary and to commence the legal actions within the frame of general legal principles.

g) To prepare the decrees and regulations defining the general principles for the utilization, export, import, transport and insurance liability of radioisotopes.

h) To grant approval, permission and license for nuclear power and research reactors and nuclear fuel cycle facilities related to the site selection, construction, operation

and environmental protection; to perform necessary inspections and controls, to restrict the operating authority in case of noncompliance with the permission or license; to revoke or suspend the permission or license and to recommend closure of those installations to the Prime Minister.

To prepare the necessary technical guides, decrees and regulations for those purposes.

i) To take the necessary measures or have them taken for the safe management, transport, permanent or temporary storage of radioactive waste generated by nuclear facilities and radioisotope laboratories.

j) To establish relations and to cooperate with the national institutions and bodies in the field of the atomic energy; to participate in the scientific studies of the foreign and international institutions and bodies working in the field of nuclear energy and to contact and cooperate with such institutions; to program and distribute the aids and assistances supplied from domestic or foreign sources for all kinds of nuclear studies.

k) To train the personnel who will work in the nuclear field or to assist their training when necessary and to cooperate with related organizations and higher educational institutions; to comment on the distribution of the domestic fellowships in nuclear field; to distribute the foreign fellowships; to conduct training courses and help them to be conducted in the country; to send students and personnel abroad; to plan and oversee their education and studies.

l) To collect, disseminate and introduce the information and the results of the studies from inside and outside the country related to the application of atomic energy; to announce the necessary information to public; to inform the public in nuclear matters.

m) To carry out studies related to national and international law in nuclear field and to propose the required arrangements.

n) To prepare and implement the decrees and regulations on the protection of nuclear materials and facilities, to inspect them, to give comments on the regulation related to this subject prepared by other organizations.

TAEK has a president and three vice presidents, who are appointed by the Prime Minister of the Republic of Turkey (Figure 5). The administrative organs of TAEK include the AEC, the Advisory Council, specialized technical and administrative departments and research centers. The organizational structure of TAEK is defined by the Law No.2690.

As a public organization, TAEK complies with the "Public Financial Administration and Control Law" No. 5018, 2003 which provides a general Quality Management System (QMS) to public organizations.

President of the TAEK chairs the AEC which consists of the Vice Presidents of TAEK, one member from each of the Ministry of National Defence, Ministry of Foreign Affairs, MENR and of four faculty members in the field of nuclear energy. Responsibilities of AEC are:

- To set the working principles and programs of TAEK, to approve the draft budget for submittal to the Prime Minister,
- To draft laws, decrees and regulations related to nuclear field, and to submit them to the Prime Minister,
- To supervise and assess the activities of TAEK, to submit the annual work program and annual work report of TAEK to the Prime Minister.

AEC also acts as a decision making body for licenses and some of the permits for nuclear installations.

The Advisory Council consists of faculty members in the nuclear field and experts from other related institutions and bodies. The members of the Advisory Council are nominated by the AEC and appointed with the approval of the Prime Minister. The Advisory Council gives advice on matters forwarded by AEC.

TAEK's main organization consists of four technical and one administrative department:

- Department of Nuclear Safety (DNS), (regulatory activities in nuclear safety and security),
- Department of Radiological Health and Safety (regulatory activities in radiation, transport and waste safety),
- Department of Technology (technological development in nuclear field),
- Department of Research, Development and Coordination (coordination of all kind of activities in nuclear field), and
- Department of Administrative and Financial Affairs (administrative and financial activities of TAEK).

Main responsibilities of DNS are the licensing of nuclear installations (review and assessment of documentation related to nuclear safety), preparation of regulations and inspection of nuclear installations.

Nuclear power plant licensing activities are carried out by DNS, the Advisory Committee on Nuclear Safety (ACNS) and The Vice President for Nuclear Power and Safety. During the licensing process, the safety analysis reports submitted by the applicant are reviewed and assessed by DNS and ACNS. DNS prepares an evaluation report taking into consideration of ACNS' advice. The evaluation report is submitted to the Vice President for Nuclear Power and Safety. The Vice President prepares a report indicating results of the evaluations and sends it to the President of the TAEK. The President of the TAEK takes the DNS safety analysis reports together with the report prepared by the Vice President to the first meeting of the AEC for licensing decision.

ACNS is established and its main responsibilities are defined in the "Decree on Licensing of Nuclear Installations, 1983". The members of ACNS are faculty members and experts working in relevant fields. ACNS performs an independent review of the documents submitted with license applications.

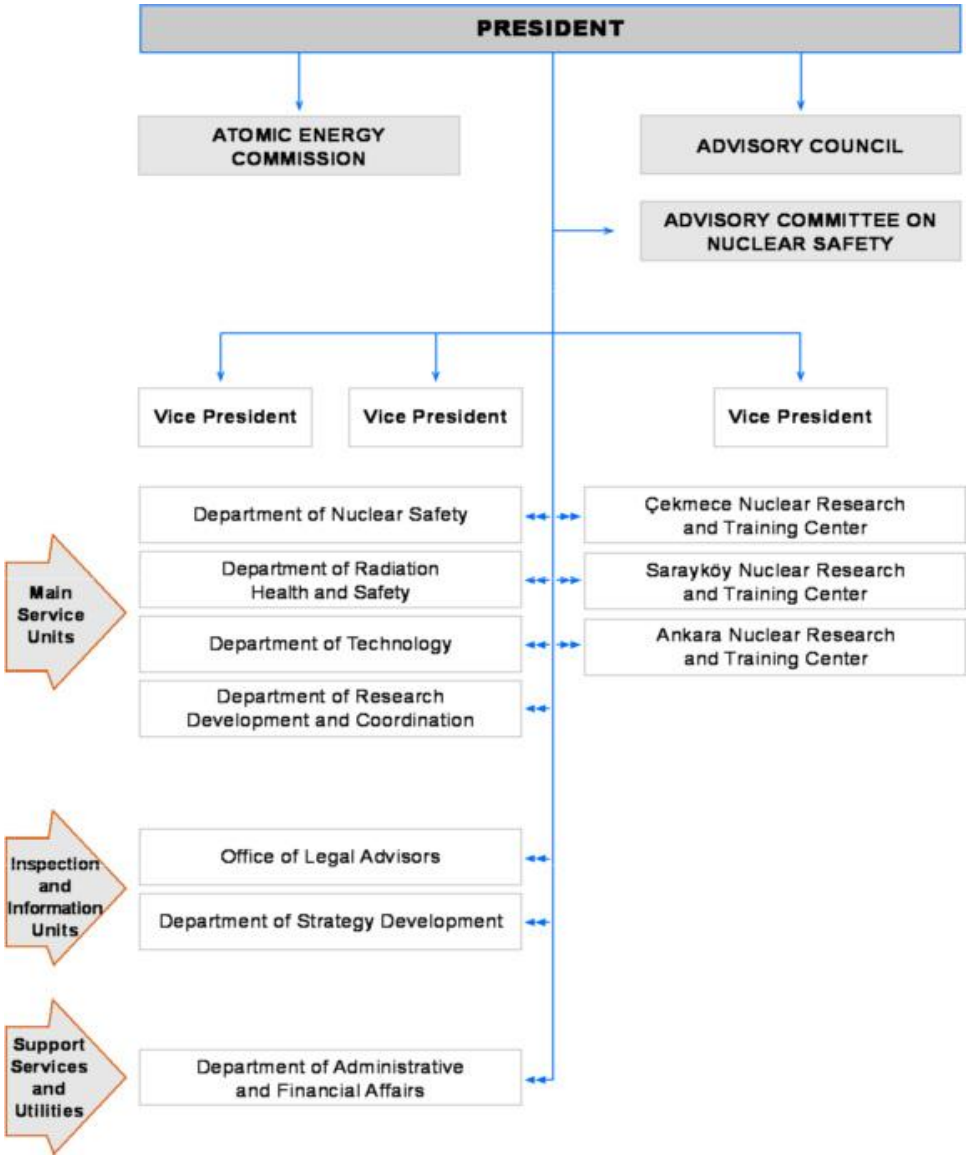

Figure 5. Organization Chart of TAEK

TAEK also operates three nuclear research and training centres to perform research, training and development activities.

5.2 STATUS OF THE REGULATORY BODY

Due to the limited nuclear programme and activities that are currently carried out in Turkey, TAEK performs both regulatory functions and research activities on utilization of atomic energy.

5.2.1 POLITICAL STATUS OF THE REGULATORY BODY

TAEK was established as a governmental body reporting to the Prime Minister. However, it was affiliated with the MENR by a Government Notice (27.11.2002 OG No: 24949). On the other hand, this affiliation is only for the administrative issues. Decision making procedures regarding nuclear safety does not include any organs of the MENR. However, Statutory Decree No. 643 (03.06.2011) caused

this separation became vague. Article 2 of the Statutory Decree No.643 modified the Law No.3046 on Establishment and Responsibilities of Ministries by adding article 19/A stating:

"Change of Affiliation

Article 19/A- Attached, related and affiliated institutions to a Ministry (including institutions on Table III attached to Public Financial Management and Control Law No.5018 dated October 12th, 2003) may be affiliated to Prime Ministry or other Ministries with proposition of the Prime Minister and approval of the President of the Republic. Authorities and responsibilities of the Ministries to which or Ministers to whom aforementioned institutions were attached, related or affiliated defined on special laws of aforementioned institutions shall be used or performed by the newly affiliated Ministry or Minister."

This results in the transfer of all authorities defined under Law No.2690 and all secondary regulations based to Law No.2690 from the Prime Minister to the Minister of Energy and Natural Resources. These authorities include the selection and assignment of AEC members, appointment of TAEK President, chairing of AEC meetings, etc. Furthermore, some of the regulatory decisions and all draft regulations became subject to the approval of Minister of Energy and Natural Resources. There is no legal channel for TAEK to report to higher authorities.

The draft Nuclear Energy Law has been prepared to establish regulatory body fully independent from utilization and promotion agencies and organizations.

5.2.2 LEGISLATIVE STATUS OF THE REGULATORY BODY

Article 4 of Law No.2690 contains TAEK's duties and responsibilities and defines the role and competence of TAEK with respect to safety. TAEK has the authority and responsibility to adopt or develop safety principles and requirements. TAEK also has the authority to take decisions including enforcement actions.

5.2.3 FINANCIAL STATUS OF THE REGULATORY BODY

As stated in Article 14 of Law No.2690 the incomes of the TAEK are composed of:

a) The funds allocated to the TAEK on yearly basis in the Prime Minister's Budget,

b) All kinds of domestic and foreign aids and donations and written wills which shall be done to the TAEK and which shall be accepted by the Authority,

c) Incomes of the production of goods and services and sales of publications.

Currently, TAEK budget comes from the central government budget. Annual budget which is proposed by TAEK goes to the formal procedure for approval by the Parliament as last deciding body for overall government budget in Turkey at the end of each year. According to this mechanism, TAEK prepares its budget proposal to implement its activities for coming year and prediction of further two years. The Parliament then approves this proposal as proposed by TAEK or changes according to the general budget provisions. TAEK's budget is approved by Turkish Grand National Assembly as a separate item under MENR's budget.

5.2.4 COMPETENCE OF THE REGULATORY BODY

TAEK recruits its staff through Public Personnel Selection Examination and this examination is a central exam to employ public personnel arranged by Measurement Selection and Placement Centre TAEK has been implementing the rules for hiring its staff

through central governmental hiring mechanisms.

TAEK utilize the benefits of memberships to international organizations like IAEA to train its staff. Law No.2690 provides the necessary legal basis to improve the human resources by stating one of the duties of TAEK at article 4-h as:

"To train the personnel who will work in the nuclear field or to assist their training when necessary and to cooperate with concerned bodies and higher educational organizations; to make recommendations on the distribution of the fellowships supported by domestic sources in nuclear field; to distribute the fellowships supported by the foreign sources; to conduct and help to conduct training courses within the country; to send students and personnel to foreign countries; to plan and follow their education and studies."

For successful licensing process of Akkuyu NPP, Turkey has plans under implementation for extending its human resources who will be employed for the licensing and inspection activities of the nuclear power plant. DNS hired 20 technical staff in March, 2014 and 10 in March, 2015. It has about 73 technical staff by June, 2016. In order to reach the required staff, there is a plan to increase the staff by 20-40 people for the licensing of Akkuyu and 40-60 additional staff for Sinop. Training activities of the unexperienced new staff proceed consistently. Although, DNS has got experience with regulating research reactors, it relies on the support from IAEA (peer reviews) and contracts with competent foreign Technical Safety Organisations (TSOs) in the field of regulating nuclear power plants. TAEK has intention to use TSOs for eliminating the competency gaps when needed. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014.

5.2.5 INFORMATION TO THE PUBLIC

TAEK has the responsibility to share information regarding the use of nuclear energy. As stated in Law No.2690 Article 4-i one of the duties of TAEK is:

"To collect, disseminate and introduce the information and the results of the studies from inside and outside the country related to the application of atomic energy; to announce the necessary information to public; to inform the public in nuclear matters."

5.2.6 INTERNATIONAL RELATIONS

TAEK has the authority to liaise with regulatory bodies of other countries and with international organizations to promote co-operation and exchange of regulatory information. This is clearly stated in Law No.2690 Article 4-g as

"To establish relations and to cooperate with the national institutions and bodies in the field of the atomic energy; to participate in the scientific studies of the foreign and international institutions and bodies working in the field of nuclear energy and to contact and cooperate with such institutions; to program and distribute the aids and assistances supplied from domestic or foreign sources for all kinds of nuclear studies."

6 RESPONSIBILITY OF THE LICENSE HOLDER (ARTICLE 9)

Prime responsibility for the safety of a nuclear installation is on the holder of the relevant license. This responsibility is implied in the Decree on Licensing of Nuclear Installations, 1983 and explicitly stated in the Draft Nuclear Energy Law. “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008” determines the safety principles to be complied by the authorized person in nuclear power plants to achieve the nuclear safety objectives defined by the Authority.

The license holder arranges his organization and distribution of responsibilities according to the “Regulation on Basic Requirements on Quality Management for the Safety of Nuclear Installations, 2007”. This regulation covers all the stages during the lifetime of a nuclear installation.

It is stated in the Akkuyu Project Agreement that the Akkuyu NPP will be licensed and inspected in accordance with the regulations of Turkey in terms of nuclear safety and radiation protection.

Akkuyu Site license had been issued to Turkish Electric Company (TEK) in 1976. The site license is still valid and transferred to APC, in accordance with the Akkuyu Project Agreement. However, TAEK requested APC to update site related studies and prepare an updated site report since current project is different than the project which was supposed to be built in 1976 as well as site characteristics and parameters were determined in 1970s. APC has been recognized as the Owner on February 7th, 2011.The Akkuyu Site on the Mediterranean coast was allocated to APC in 2011 as specified in the Akkuyu Project Agreement. APC started site investigations in Akkuyu for updating the site characteristics and parameters according to the Decree on Licensing of Nuclear Installations, 1983 and other related legislation.

The public relations for the Akkuyu NPP Project are carried out by APC. Information exchange with public is provided by the information centers. The project includes measures of public relations at the EIA stage - public discussions, etc. The public relations activities of the project will continue during the construction and operation phases. In this regard, besides using the local newspapers, television and radio, the newspapers, television and radio broadcasted on a national scale will also be utilized within the scope of the public relations activities.

APC established a Public Information Centre for communication with public in Mersin in 2012 under the cooperation of the Russian Federation and the Republic of Turkey in relation to the design and construction of the first nuclear power plant on territory of Turkey, Akkuyu NPP. The Public Information Center is a versatile communication platform and provides excursion programs both for the population in Mersin Province, in neighbouring provinces and other regions. Among the visitors there are children, students, representatives of authorities and mass media, tourists and many others. The Center visitors may get information about the history and development of the nuclear industry, use of achievements in physics, prospects of the energy development and about the social and economic development of the Republic of Turkey which is related to construction of the nuclear industry enterprises and accompanying infrastructure.

The Public Information Center of Akkuyu NPP in Mersin is a platform for the trust-based, open and interesting dialogue of the citizens of

the Republic of Turkey on the nuclear energy topic.

All activities of the Public Information Center of Akkuyu NPP are pro bono ones. All visits are free of charge. APC arranges education and training of the students in universities of the Russian Federation, technical training of specialists at training centers of the Russian Federation and in the operating NPPs.

294 Turkish students related to the Akkuyu NPP were being educated in Russian Universities by February 2016.

APC will also establish a training center for Akkuyu NPP.

7 PRIORITY TO SAFETY (ARTICLE 10)

The main mission of TAEK, the regulatory body is to ensure that the use of nuclear energy in Turkey does not pose undue risk to human health and the environment. Basic tools for realization of this mission are the national regulations and international instruments, guides and standards. The national regulations are mainly based on IAEA safety requirements, standards and guides and international experiences, giving high priority to the safety. For issues not covered by national regulations TAEK uses IAEA safety requirements.

TAEK's licensing regulation establishes safety principles to be followed during the design, construction, commissioning, operation and decommissioning of nuclear power plants to achieve nuclear safety objectives.

TAEK achieves regulatory control of nuclear facilities and nuclear materials through a comprehensive licensing system. TAEK's licensing system assures that nuclear facilities and nuclear items are utilized with proper consideration for the protection of workers, public and the environment and nuclear security. Prime responsibility for the safety of a nuclear installation is on the holder of the relevant license.

Detailed regulatory requirements and responsibilities of license holders related to quality assurance are defined in the "The Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities No: 26642 Date: September 13rd, 2007 (BQMR)". The BQMR includes many topics such as mandatory basic quality management principles, responsibilities, relations with the authority and enforcements. The BQMR is supported by 14 safety guidelines (Guidelines for Quality Management Systems for Safety of Nuclear Facilities GK-KYS-01-14 2009 – 2011) which cover all stages of nuclear facilities, in line with IAEA "50-C-SG-Q Quality Assurance for Safety in Nuclear Power Plants and other Nuclear Installations Safety Guides Q-1-Q14" document.

Draft Nuclear Energy Law has provisions on the responsibilities and obligations of license holders and regulatory organization.

According to the Inter-Governmental Agreement, APC is responsible for the design, construction, commissioning, operation, and decommissioning of the Akkuyu NPP. In the statement of quality policy, APC states that the highest priority of activity is the safety of "Akkuyu" NPP and the personnel, as well as minimizing impact on population and environment. Unconditional priority will be given to NPP safety requirements in review of any design, engineering and technological developments and alternative solutions, as well as in selection of contractors and subcontractors, producing and controlling work schedules.

In implementation of the quality policy, APC adhere to the following principles:

- Commitment to "safety culture" concept and maintaining an environment where safety oriented thinking of the personnel is established forming questioning attitude, excluding complacency and fostering excellence, development of ownership and dedication in safety issues,
- Graded application of safety requirements in implementation of all types of activities influencing on company safe and effective performance,
- Systematic planning, clear definition of safety priorities and timely provision

of the required resources including human, financial and material,

- Ensuring rigorous and precise implementation of all tasks and activities in accordance with the applicable regulatory safety requirements, approved procedures and best international practice,
- Application of a process approach in quality management and performance,
- Implementation of works and performance of activities by personnel having suitable knowledge, skills and qualification,
- Commitment to “no blame” policy and creating an environment allowing for personnel involvement in open discussion and solution of safety related issues.

8 FINANCIAL AND HUMAN RESOURCES (ARTICLE 11)

8.1 FINANCIAL RESOURCES

8.1.1 FINANCING OF SAFETY IMPROVEMENTS

APC, as the plant operator, will be responsible to ensure the necessary financial provisions for safety improvements to the nuclear installation over its operational lifetime. Planned maintenance expenses are considered in the operational costs of the plant. Future investments needed to ensure safety during the plant operation (for example as a result of equipment aging / wearing / obsolescence, or additional international requirements in the future, innovative design solutions, etc.) will be financed, in general, through the APC revenue, which will be accumulated through electricity sales.

In addition, annual payments to an APC's internal account for safety will be made during the plant operation. This is a special account for safety in which APC will accumulate amounts on annual basis, and the accumulated funds will be spent on modernization programs, related to safety. As mentioned above, these could, for example, be modernizations needed to replace aged or obsolete equipment, to comply with future international safety requirements, to apply innovative design solutions, etc. The approach is in compliance with the Russian legislation (Federal Law No 317 – Ф3 dated December 1st, 2007), which requires such funds to be collected by the state corporation "Rosatom".

The following main principles will apply:

- Priority will be given to financial resources necessary to ensure the safety of the nuclear installation throughout its operational lifetime, including measures to comply with the actual safety requirements,
- An adequate organizational structure and procedures will be put in place to support the proper planning of necessary measures, as well as ensuring respective financial resources required for their implementation,
- Attention will be paid, both on sufficiency and on timely provision of such financial resources,
- While in general, financing for safety during the plant operational lifetime will be ensured through electricity sales' revenue, the following specific sources could be used:
    - APC cash balance;
    - APC special safety account;
    - Credits.

8.1.2 FINANCIAL PROVISIONS FOR DECOMMISSIONING, SPENT FUEL AND RADIOACTIVE WASTE

Intergovernmental Agreement (IGA) signed between the Turkish and Russian party for construction and operation of the Akkuyu NPP stipulates that APC, that the Project Company, which will own and operate the plant, will be responsible for decommissioning and waste management of the NPP (Article 12, par. 4). The Project Company is obliged by the IGA to make the necessary payments to relevant funds stipulated by the Turkish laws and regulations. The following amounts shall be paid by the Project Company for the electricity, purchased by TETAS (IGA, Article 10, par. 9):

- 0.15 US dollar cents per kWh to the account for spent fuel and RAW management, and

- 0.15 US dollar cents per kWh to the account for decommissioning.

With regards to the electricity sold outside the Power Purchase Agreement (PPA), the necessary payments to the funds shall be in accordance with the Turkish laws and regulations. IGA and Turkish legislation, Law No.5710, stipulates the main principles, related to decommissioning and Radioactive Waste accounts. Both accounts shall be constituted by an arrangement formed by the MENR and the Treasury. The operations of the accounts will all be exempted from taxation. The procedures and principles regarding the establishment, creation and management of the decommissioning and Radioactive Waste accounts shall be prepared jointly by the MENR and the Treasury. The revenue collected in the name of the Decommissioning and Radioactive Waste Account may only be used within its purpose. Payments to the Decommissioning and Radioactive Waste Accounts are determined by the law at 0.15 USD cents / kWh for each account. At the end of the operational period, the plant operator (enterprise – company which produces and sells electricity), is obliged to decommission the plant under the criteria to be issued by TAEK. The decommissioning costs will be covered by the Decommissioning Account. Should recourses of the account prove to be insufficient; the Treasury will cover an amount of up to 25% of the accounts collected in the Decommissioning account. Should this prove to be insufficient, the enterprise (plant operator) shall cover the excess cost. Further elaboration of the Turkish legislation in regards to the decommissioning and Radioactive Waste accounts is expected; this will establish the accounts and will stipulate the main principles of their management and operation.

8.1.3 ADEQUACY OF FINANCIAL PROVISIONS

Decree on licensing of nuclear installations (published in the Official Gazette Number 18256 dated 19.12.1983) stipulates in Article 6 that the applicant for construction and operation license of a nuclear installation has to submit within the application a description of his technical and financial abilities. Financial capabilities of the company, applying to construct and operate a nuclear power plant, shall be demonstrated in front of the relevant authorities in order to obtain a license.

Payments to the Decommissioning and Radioactive Waste Management accounts as determined by the Turkish legislation (Law No. No. 5710) and by the IGA (Article 10, par. 9) are expected to be sufficient, considering the actual information on decommissioning and Radioactive Waste Management costs and the estimates of the electricity production. The similar recommendations are contained in the Directives Council Directive 2011/70/EURUATOM of July 19th, 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste. However, during the entire plant operational lifetime, periodic review of the amounts accumulated in the accounts shall be made and shall be assessed versus the updated information on the Decommissioning and Radioactive Waste management costs.

According to the Turkish legislation and IGA, Article 16 on nuclear responsibility, the APC will be ensuring the necessary financial resources in the event of the radiological emergency.

8.1.4 PROCESSES FOR THE ASSESSMENT OF THE FINANCIAL PROVISIONS

Modernization programs will be developed for 6-years periods. They shall be based on the design requirements, actual plant status, international safety cases and development, etc. Programs will include financial resources needed for their implementation.

Repair and maintenance planning shall be made annually, based on the design requirements, equipment maintenance instructions, equipment status, as well as experience in operation of nuclear power plants. Annual planning will include financial resources needed for implementation of the maintenance.

Decommissioning and Radioactive Waste management costs shall be reassessed every 5 years, based on the updated information, plant status, operational records, etc.

8.2 HUMAN RESOURCES

The Akkuyu NPP have designed, manufactured and will be constructed commissioned, and operated by APC (owner and operator) established according to Turkish laws and financed by Russia. However, this does not imply that the all personal will always be Russian. At the beginning of 2016 about 32 percent of Turkish citizens are working in the Project Company. According to Turkish legislation, the formal language of communication is Turkish.

IGA, Article 6, Par.5 stipulated that Turkish citizens shall be trained and widely employed for the purpose of operating needs of the NPP. Such training shall include but not limited to, the establishment of an on-site full scope simulator.

8.2.1 NPP PERSONNEL TRAINING

It is foreseen that for the construction and commissioning of the four units of Akkuyu NPP more than 10,000 persons will be involved, and then about 4000 will be constantly needed during the 60 years of plant operation.

The Russian party will provide support and assistance in training of professional staff for nuclear power development in Turkey. The selection of Turkish students to undertake nuclear energy learning had been began in 2011. In the month of February, 294 students were having education in the Russian Nuclear University (2016).

The APC provides support and assistance in training of professional staff for NPP consideration in Turkey. APC is seeking for the new opportunities to develop its own educational and training capabilities to better assure the long term availability of the human resource and to provide opportunities to the local citizens.

APC is able to provide the training of future operating personnel using NPP training simulators or similar operating units. Elimination of the language barrier will be provided by arrangement of language courses.

APC is also intended to use Systematic Approach for Training (SAT) for attaining and maintaining the competencies of personnel as the mentioned approach is entirely compatible with the management system as it is also a process based, result oriented, and systematic approach. Through the analysis and design phases, training will be focused on certain necessary job specific competencies. Evaluation of the training programme's effectiveness and continual improvements will ensure maintaining of the personnel competence and training programmes up to date, and significantly contribute to the safe performance.

APC has developed the Akkuyu NPP personnel training manual that describes the main principles and requirements for initial training and continuing training or retraining.

The training programme for emergencies will be established to train APC staff to ensure the effectiveness of the response. Emergency preparedness exercises will be designed before commencing the operation to ensure that NPP staff and staff from other participating organizations possess the required knowledge, skills and attitudes.

8.2.2 QUALIFICATION MAINTENANCE

The NPP personal shall be have the diploma or certificate on education and specialization in order to work on the nuclear installation. The NPP personnel qualification will be maintained in the Training Center, NPP divisions and other educational institutions on an annual basis.

Annual duration of NPP personnel training, in compliance with qualification maintenance programs, shall be as follows:

- NPP Main Control Room operators– at least 80 hours, including 36 hours of practical training on the simulators;
- Other categories of NPP personnel – at least 20 hours.

8.2.3 IMPROVEMENTS TO TRAINING PROGRAMMES

APC will be arrange the assessment and improvement of the training programmes by periodically.

The training methods and practices will be put in place for the for the timely modification and updating of the training facilities, computer models, simulators and materials to ensure that they adequately reflect current plant conditions and operating policy, and that any differences are justified.

8.2.4 ASSESSMENT OF THE SUFFICIENCY AND THE QUALIFICATION OF THE NPP STAFF

In accordance with the laws and regulatory documents, qualification requirements are determined for those professionals, who, depending on the type of activities have to obtain license to carry out work in the field of nuclear energy.

The NPP Director shall arrange preliminary (at employment commencement) and regular (during employment) medical examination of employees, working with harmful substances or dealing with dangerous or adverse factors of the working environment.

NPP specialists, who, depending on the functions performed, must receive permit for work in the field of nuclear power use, shall undergo preliminary and annual medical and psychological examination.

Professional training opportunities will be provided for young specialists, for new employees, for staff transferred to new positions, etc., in accordance with the specific needs and requirements of the related jobs.

The NPP personnel shall be have the diploma or certificate on education and specialization in order to work on the nuclear installation.

NPP personnel qualification shall be maintained on an annual basis, in the following forms:

- Off-the job training, intended to retain professional knowledge and skills obtained during training courses and in other educational institutions,
- On-the-job-training in the Training Centre and NPP divisions,
- Repeated, off-schedule and special-purpose briefings,

- Accident mitigation, fire protection and emergency drills,
- Training of NPP operational personnel on the simulators, including activities related to power unit startup/shutdown and operations preceding power unit scheduled startup/shutdown,
- Fellowships, including in specialized companies, participation in seminars and workshops,
- Training and regular licensing of NPP employees, working on facilities or performing works under the authority of official supervision or regulatory bodies and other agencies in compliance with procedures, approved by the corresponding authorities,
- Self-study of professional related issues.

The NPP personnel qualification shall be maintained in compliance with qualification maintenance programs. The programs, as above, shall be elaborated according to the requirements established by the APC.

APC plans to use the own personnel and inviting personnel from other NPP, as additional staff required for the severe accident managements.

8.2.5 REGULATORY REVIEW AND CONTROL ACTIVITIES

Operator responsibilities, human resource management issues, and training of operating personnel are detailed in the "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008". According to the regulation, the Licensee has the prime responsibility for ensuring that employees are qualified and have the necessary authority and skill set to perform their assigned tasks. The Licensee shall employ an adequate number of competent and experienced personnel throughout the entire life of the plant in order to ensure safe operation.

In accordance with the laws and regulatory documents, qualification requirements are determined for those professionals, who depending on the type of activities have to obtain license to carry out work in the field of nuclear energy. The NPP Director shall arrange preliminary (at employment commencement) and regular (during employment) medical examination of employees, working with harmful substances or dealing with dangerous or adverse factors of the working environment. NPP specialists, who, depending on the functions performed, must receive permit for work in the field of nuclear power use, shall undergo preliminary and annual medical and psychological examination.

APC specifies the requirements related to competence of the employees of all the levels and ensures staffing and proper staff training consistent with IAEA Safety Standards Series No. NS-G-2.8, Recruitment, Qualification and Training of Personnel for Nuclear Power Plants, Vienna, 2002, other international guidelines and Russian national requirements in the nuclear field. The requirements are presented in detail for each position in the respective job descriptions.

Studies for preparation of "Draft Regulation on the Operating Organization, Qualifications and Training of Operating Personnel, and Licences of Operating Personnel in Nuclear Power Plants" began in 2014 and has been completed in late of 2015. This Regulation has been prepared based on Article 4, paragraph one, sub-paragraph (e) of the Law of the Turkish Atomic Energy Authority No. 2690, dated 07/09/1982. As of June 2016, the legal process relating to the entry into force of the regulation is in progress. The Regulation is to determine the procedures and principles for operating organization, qualifications and training of operating personnel, and licenses of operating personnel in nuclear power plants.

8.2.6 WORKFORCE PLANNING FOR REGULATORY BODY

TAEK has plans under implementation for extending its human resources who will be employed for the licensing and inspection activities of the nuclear power plant. TAEK also has intention to use technical support organizations (TSO) for eliminating the competency gaps when needed. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014.

For the future needs, TAEK has a human resources plan and the first version of the report regarding human resources planning for Department of Nuclear Safety (DNS) was published in 2013. It was revised by using the latest scenario according to results of Expert Mission to review draft national HRD plan in May 2015. The report includes gap analysis and recruitment data for medium term (for Akkuyu and Sinop licensing progress until 2030) and short term needs. According to this report for the licensing activities for Akkuyu and Sinop NPP Projects, 120 and 170 technical personnel are required by 2016 and 2020 respectively. DNS hired 20 technical staff in March, 2014 and 10 in March, 2015 and has about 73 technical staff by June, 2016. In order to reach the required staff, there is a plan to increase the staff by 20-40 people for the licensing of Akkuyu and 40-60 additional staff for Sinop licensing.

In order to finalize the workforce planning analysis by systematic study, the IAEA tool Systematic Assessment of Regulatory Competence Needs (SARCoN) will be utilized. An Expert Mission on SARCoN tool and systematic approach for training has been conducted in February 2013 and then a study has been initiated to develop systematic competency management framework based on IAEA's SARCON model.

In order to getting technical support for inspections, TAEK has initiated a study for preparation of tender documents.

8.2.7 COMPETENCY MANAGEMENT ACTIVITIES FOR REGULATORY BODY STAFF

TAEK is aiming to establish an effective and efficient management system for the organization and performance of its activities. The management of competence is a part of this and needs to be integral part with the overall management of the TAEK. The main objective is to ensure having the right number of staff with the right and enough competences at the right time. For these purposes DNS started to develop a "Nuclear Safety Department Competency Management System Portal Application Tool".

TAEK has also started a programme to improve its capacity, knowledge and experience in the following areas:

Project management, Legal issues, Earth Sciences, Radiation protection and Emergency Planning, Nuclear Physics, Nuclear Engineering, Dosimetry, PSA, Accident Analysis, Quality Management, Electrical Engineering, Mechanical Engineering, Material Engineering, Civil Engineering, Chemical Engineering, Instrumentation and Control Engineering, Fire Protection, Nuclear Security and Physical Protection.

8.2.8 TRAINING PROGRAMME FOR REGULATORY BODY

TAEK has been trying to increase its capability for the conducting of each function of the regulatory body. Training of DNS staff concentrates on the regulatory process used for reactor oversight and on the special technical functions that a regulator must perform and the results of competency gap

analysis are using for the establishment of the training program.

Regulatory processes include enactment and development of regulations, licensing, and inspection activities. Training in these processes will be gained through rotational assignment in countries with mature regulatory programmes by TAEK or through the IAEA. Trainings will be concentrated on review and assessment of PSAR and inspection.

TAEK performs training programme as below:

1. Internal trainings
    - Entry level training for new staff provided by TAEK experienced staff
2. Domestic trainings
    - Academic units in Turkey
    - Other organizations experienced in specific subjects
3. International trainings
    - IAEA
    - European Commission
    - Bilateral agreements with other regulatory organizations
    - Technical support organization
    - Others

The aim of training of TAEK staff is to provide knowledge and experience that result in confidence that staff is qualified to perform the essential functions of regulatory body. Within this context variety of tools are being used including IAEA instruments. TAEK has requested IAEA to create a specific TC project for this purpose and provided its own financial resources for the project. IAEA TC TUR/9/017 project is fully funded by Turkey.

The expected outcomes of the project are:

- Staff trained on evaluation of submittals of siting, construction and operation of NPPs; and on manufacturing and construction inspections,
- Established procedure/documentations on evaluation of submittals of siting, construction and operation of NPPs; and on manufacturing and operation inspections.

Improving DNS staff's knowledge in the field of review and assessment of PSAR and inspection are the main purposes of this project. The main tools in the project are On the Job Trainings, workshops, training courses and expert missions' tools.

Another international project to enhance the nuclear safety regulatory infrastructure is planned with European Commission. A European Commission Instrument for Pre-accession Assistance (EC IPA) project has been prepared. In the Sector Identification fiche - IPA National programmes / Component I for Energy Sector as a Measure 5 Improvement of Nuclear Safety Regulatory Infrastructure the project has been submitted to the European Commission. The process is going on for the implementation of this project. This project will be carried out together experienced regulatory bodies of European Union and it is expected to focus on gaining European Union experience in the fields of development and enforcement of regulatory framework (acts, regulations, technical guides, etc), enhancing regulatory capacity in review and assessment of safety documentation and inspection of nuclear facilities and activities, and improving TAEK's self-sustainability in drawing up regulatory training programs.

The main activities of this project are:

- Project management,
- Review and improvement of national nuclear regulatory infrastructure,

- Assistance in the development of national nuclear regulatory infrastructure,
- Development of methodologies for review and assessment of licensing documents,
- Establishment of the technical support system for independent safety assessment,
- Development of methodologies for regulatory inspections,
- Training of personnel of regulatory organization.

Besides this project, Autorité de Sûreté Nucléaire (ASN) and its technical support organization Institut de Radioprotection et de sûreté Nucléaire (IRSN) selected as a Twinning partner of TAEK, and ASN and TAEK will work together for "Improvement of Nuclear Safety Regulatory Infrastructure of Turkey" project under IPA ınstrument.

TAEK also continue to work with Japan and Russian Federation for training activities on a regular basis.

8.2.9 THE ROLE OF TSO IN REGULATORY ACTIVITIES

Hiring new staff and training them for TAEK's needs would not provide enough technical resources with proper competency in timely manner. As an important adjunct to the regulatory staff, TSO will have the role to supply the TAEK with specialized technical skills. For this purpose TAEK is planning to use TSO whenever it needs in order to accomplish its regulatory functions internally or outside the country. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014. UJV Rez is an independent company from the Vendor (Owner) and has experience in licensing and inspection issues of WWER type reactors.

There are also plans and initiatives to create internal technical support unit in TAEK by using technical and human resource capacity in ÇNAEM-TAEK.

9 HUMAN FACTORS (ARTICLE 12)

"Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" and "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008" defines safety principles, including human factors to be followed during the design of nuclear power plants to achieve nuclear safety objectives.

To avoid human errors "Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" includes the following requirements to NPP design:

- Parameters to be monitored in the control room are selected, and their displays are arranged, to ensure clear and unambiguous indications of the status of plant conditions important for safety, especially for the purpose of identifying and diagnosing the automatic actuation and operation of a safety system or the degradation of defence-in-depth,
- Control room is provided with a display of the information on plant variables needed to ascertain the status in normal operation, to detect and diagnose off-normal conditions, and to observe the effect of corrective responses by control and safety systems,
- The control room is designed to remain habitable under normal operating conditions, anticipated abnormal occurrences and accidents considered in the design,
- The environment in the control room is protected against abnormal conditions that might compromise the operators' effectiveness or jeopardize their health.

Requirements for qualification of operating personnel as part of human factor are also covered in Turkish and Russian legislative and normative documents.

In the Akkuyu Project Agreement training of the staff is mentioned as "the parties shall cooperate in regard to: training and retraining of operating personnel of the NPP, the development and use of technical training, facilities, including simulators, for training of personnel of the NPP".

The systematic self-assessment of senior managers and management at all other levels in the APC are integral part of the monitoring and review system in order to identify achievements and address any degradation in the safety performance.

Russian normative documents and standards require human factor to be accounted for during NPP lifetime, including design stage. Russian safety rules "General regulations on ensuring safety of nuclear power plants" NP-001-15 state that:

- The design shall provide for the possibility to exclude personnel single errors and mitigate their consequences,
- In the design of NPP and reactor plant systems (elements) priority shall be given to systems (elements) design of which has been based on the passive principle of action and inherent safety features (self-control, thermal inertia and other natural processes,
- In the design of the control rooms problems of man-machine interface shall be solved. Parameters to be controlled shall be so selected and displayed as to provide personnel with unambiguous information indicating that NPP safe operating limits and conditions are met, and identification and diagnostics of

automatic response and functioning of safety systems are possible,

- NPP shall be staffed with personnel having the necessary qualification and admitted to independent work in the established order prior to delivery of nuclear fuel to the plant. Simulators have to be used for operation personal training before commence of unit operation.

10 QUALITY ASSURANCE (ARTICLE 13)

10.1 REGULATORY REQUIREMENTS FOR QUALITY MANAGEMENT

TAEK gives highest priority to safety during the licensing of all nuclear facilities. TAEK's regulatory activities are in parallel with IAEA directives, requirements, guides and principles. According to "Decree on Licensing of Nuclear Installations, 1983" the license holders or applicants should have quality assurance programmes for different stages of the implementation of nuclear power plant projects and submit those programmes to TAEK. TAEK, then, reviews and assesses quality assurance programmes when implementing licensing process.

Detailed regulatory requirements and responsibilities of license holders related to quality assurance are defined in the "The Regulation on the Basic Quality Management Requirements for Safety in Nuclear Facilities No: 26642 Date: September 13rd, 2007 (BQMR)". The BQMR includes many topics such as mandatory basic quality management principles, responsibilities, relations with the authority and enforcements. The BQMR is supported by 14 safety guidelines (Guidelines for Quality Management Systems for Safety of Nuclear Facilities GK-KYS-01-14 2009 – 2011) which cover all stages of nuclear facilities, in line with IAEA "50-C-SG-Q Quality Assurance for Safety in Nuclear Power Plants and other Nuclear Installations Safety Guides Q-1-Q14" document.

At the same time, to provide a highest nuclear safety and safety culture in nuclear facilities and activities, with the purpose of incorporating lessons learned from previous experiences, a new regulation titled "Integrated Management System Requirements for Safety in Nuclear Facilities" was drafted which is aspiring to establish an integrated management system, in parallel to IAEA "GS-R-3 Safety Requirements for Facilities and Activities" document. Latest draft of new IAEA document on this issue, GSR Part 2 – Leadership and Management for Nuclear Safety, has also been used when drafting the new regulation.

According to Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012, a list of regulatory documents is defined for licensing of nuclear power plants in Turkey. The approved "List of Licensing Basis for Akkuyu Nuclear Power Plant" is mainly composed of Turkish regulations, IAEA Safety Fundamentals and Requirements and Russian Federation Regulations. The list includes "The Management System for Facilities and Activities Safety Requirements, Series No. GS-R-3, 2006" and "GS-G-3.1, Application of the Management System for Facilities and Activities, 2006" documents of the IAEA in addition to BQMR. The list also includes Russian Federations regulations and guides regarding the management systems and quality assurance for nuclear power plants.

10.2 QUALITY MANAGEMENT SYSTEM OF REGULATORY BODY

TAEK has started to establish its own internal QMS for its main departments which are relevant to nuclear and radiation safety, nuclear security and licensing of nuclear installations. The QMS of TAEK has been established in 2014 in accordance with ISO 9001:2008 standard. The activities regarding the improvement of the TAEK QMS has been initiated following the start of the implementation of the QMS. The aim of the improvement is to establish Integrated Management System in compliance with the

latest IAEA standards. The updated system will also comply with the 2015 version of ISO 9001.

TAEK Integrated Management System includes: processes for overall management of the organization; processes for main regulatory functions; and processes for supporting activities. TAEK IMS incorporates below approaches and values:

- Priority to safety and security,
- Safety and security culture,
- Graded approach,
- Independence and competence,
- Objectiveness and trustfulness,
- Openness and accountability,
- Commitment to ethical,
- Quality and effectiveness,
- Continuous improvement.

TAEK utilizes external technical support services in implementing its regulatory activities including review and assessment and inspections when it deems necessary. Hiring those services are implemented in accordance with the national procurement rules and regulations and based on commercial contracts. TAEK always seeks proper quality management system in its contractors for main service providers. There is a formal internal procedure to oversee the activities of contractors for such technical support services in TAEK IMS.

TAEK IMS self-assessment and external audit for evaluating the performance of the management system and improving it to enhance the effectiveness of the organization.

10.3 QUALITY MANAGEMENT SYSTEM OF AKKUYU NPP

Regulations and practices in the area of quality management in nuclear developments in Turkey have significantly increased during the last years. APC has started the implementation of a QMS directed to provide for arrangements and ensure safety in activities performed in a most coherent way. The system established integrates the safety, health, environmental, security, quality and economic issues plus other considerations such as social responsibility in an integrated framework. The management system identifies and integrates the requirements contained within the applicable codes, standards, statutory and regulatory requirements. The management system is designed to promote and support a strong safety culture.

A General QMS Manual has been developed in accordance with the requirements of BQMR Regulation, IAEA Safety Standards (GS-R-3) and ISO 9001:2008 and implemented. The QMS covers all management activities and processes, services and items influencing on safety, reliability and effectiveness during the all NPP throughout the lifetime.

Akkuyu NPP General QMS Manual describes specific approaches, and organizational and management measures, aimed to ensure quality and strong safety culture at all stages of the NPP.

Beside a Configuration Management System (CMS) manual has been developed and its system to be established as per the requirements of ISO 10007:2003 Quality Management Systems- Guidelines for Configuration Management Standard. These QMS and CMS have been developed and approved by APC and approved by TAEK.

According to QMS the configuration management process is performed to guarantee that changes made to enhance the efficiency and economic effectiveness do not compromise the safety. APC defines requirements to procedure of preparation of proposals, substantiation and incorporation of different changes.

The main principal used as a basis to establish an organizational structure was to meet the general requirements for nuclear safety of the NPP, taking into consideration the particular stage of the plant life cycle. Besides, account was taken of which functions should be performed at the NPP site and off the site. The QMS describes the project activities and the processes of the organization. The supporting information is provided in the guidelines that comprise the second level of QMS documentation that are presented in Management System Procedures and are planned to develop according to the Schedule of development of the Company Management System documentation.

APC ensures the systematic measurement, monitoring and assessment of the management system in order to ensure that the system is effective and to define areas requiring improvement. Various monitoring and assessment types are applied with the purpose: control/oversight of activities by managers and monitoring/measuring of the processes, including self-assessment' and independent assessment. The QMS defines a separate process for these activities.

The QMS defines a separate process for ensuring safety and reliability. The process is dedicated to manage different aspects of safety, such as nuclear, radiation, industrial, fire, environmental and seismic. It sets priority and specifies the requirements to ensure of safety, risk management, health and environment protection.

The QMS declares that the management system implemented is used to facilitate and support strong Safety Culture by means of:

- Ensuring common understanding of key aspects of Safety Culture by the personnel of the organizations and suppliers,
- Ensuring the required resources and infrastructure to provide conditions where the employees can perform their tasks in a safe and successful manner considering human-technology-organization interface,
- Encouraging constructive and questioning attitude at all levels of organization and suppliers,
- Providing resources aimed at continuous development and enhancement of Safety Culture.

The QMS defines a particular process for monitoring measurement and assessment of the Company performance. Specific procedures defining requirements for planning carrying out audits and self-assessments are developed and implemented.

The management system is aimed to develop of such values, behaviour and basic assumptions that will ensure sustainable development and reinforcement of the most important attributes/features for healthy and strong Safety Culture.

APC aims to implement different activities for systematic communication to all personnel and dissemination of appropriate values and behaviour, and provide training and briefing in order to ensure common understanding of Safety Culture and ensure strict adherence to safety requirements.

Detailed principles of relationships between different project participants were stipulated in the QMS. The following main rules are applied as far as concerned to different contractors and subcontractors of the APC:

- All activities on the project are performed based on Contracts, which shall clearly specify the scope of works and responsibilities,
- Each project participant shall develop and implement its own quality management system, providing that it is coordinated with the APC or respective employer,

- Each QMS shall ensure meeting the requirements of applicable codes and standards, efficient application at all the stages of activities, possibility for the APC to access the necessary documents that confirm quality of the activities performed, necessary measures to be taken on non-conformances detected to the products, equipment and services being supplied, persons involved in the project should be properly qualified for the assigned tasks,
- Sufficiency of guarantees to assure proper quality of the equipment and services being supplied is confirmed by external audits on behalf of the Company.

Subcontractors are evaluated and selected based on objective evidence on their capability to perform the contractual obligations, including quality management requirements.

A purchasing committee has been established that is especially dedicated for evaluation of the submitted contract and technical information and decision making. In addition, a special procedure for preliminary evaluation of the possible subcontractors has been developed and implemented.

The QMS defines a particular process for monitoring measurement and assessment. Specific procedure has been developed and implemented on requirements for external audits.

APC is currently creating portfolio of Turkish companies with capabilities to participate in the plant construction works, in providing construction materials, equipment and machinery, as well as handling maintenance and repair services. All the above principles and requirements are applying.

The general QAP manual of APC defines a particular process for monitoring measurement and assessment. Specific procedure such as Standards of Company, Audit Programmes has been developed and implemented on requirements for internal audits.

In accordance with General GAP manual the APC insures systematic measurement and monitoring of QMS so as to define the system's ability to achieve the expected results in the area of activities to be improved. Various types of monitoring are performed for this purpose: control/supervision of operation by top managers and monitoring/measurement of processes. To ensure monitoring and Verification internal Audits are carried out by the APC permitting it to assess the efficiency of QMS.

The general purpose of internal Audit is the Analysis of the current of QMS, determination of the need for improvements and development of Corrective Actions in collaboration with audited division.

Internal Audit of each unit shall be carried out once a year based on the relevant approved schedule and program.

In accordance of General QAP the APC provides systematic measurement and monitoring of the Suppliers' QMS in order to define the system's ability to achieve the expected results in the area of activities carried out in the course of implementation of Akkuyu NPP project. For this purpose the APC performs different types of QMS monitoring confirming compliance with established requirements to the Supplier Company's activities with help of objective evidence. Audit performance by the APC is one of the QMS Efficiency Assessment methods on the approved program.

10.4 QUALITY MANAGEMENT SYSTEM OF SİNOP NPP

Activities related to the implementation of the Sinop Nuclear Power Plant Project have been initiated by Electricity Generation Company

(EÜAŞ) which is state owned enterprise in Turkey in 2012. Activities, then, have been supported by EÜAŞ's project partners in accordance with the Intergovernmental Agreement (Sinop IGA) which was signed in 2013 between Governments of Japan and Turkey. Currently feasibility studies for the project is ongoing including site investigation. Quality Management System for siting activities have been developed by the project partners and submitted to TAEK. Sinop QMS for siting stage has been reviewed by TAEK and then approved. All activities in the implementation of the project have been performed according to the process and procedures defined in the QMS.

10.5 REGULATORY REVIEW AND CONTROL

According to BQMR, the quality and configuration management manuals and plans and relevant procedures for each unit of nuclear power plants are to be produced for all stages: one for overall management plus different manuals and plans for each single stage. Those manuals and plans are subject to approval of TAEK. All related QMS documentation is to be submitted for review and assessment. TAEK reviews and assesses the compliance of QMS documentation with the requirements by means of audits, monitoring, surveillance and inspections.

The quality grading methodology as well as safety and quality classification lists have to be submitted together with the general quality manual and plan. The applicant has to make a commitment in the relevant chapter of the safety analysis report regarding its full compliance with BQMR regulation and IAEA GS-R-3 Safety Standard Requirements document and has to demonstrate that the requirements are fulfilled.

During the regulatory quality inspections, if any non-conformances or deviations are determined, the works may be stopped by TAEK unless corrective and preventive actions are taken by the licensee who carries out the quality management activities for the related stage of the nuclear facility.

In addition to the oversight of applicants/licensees over their vendors, TAEK's regulatory control is also applied those vendors according to the BQMR requirements. In order to implement regulatory control over major equipment manufacturers for nuclear power plants to be built in Turkey, a new regulation (Regulation Regarding Equipment Procurement Process and Approval of Manufacturers for Nuclear Facilities) has been issued in 2015. According to this regulation, manufacturers of equipment which are important to safety has to be approved by TAEK and subject to TAEK's inspections. During the approval process for manufacturers, TAEK seeks for established Quality Management System in the manufacturers' organization and facilities.

11 ASSESSMENT AND VERIFICATION OF SAFETY (ARTICLE 14)

Rules, procedures and documents to be submitted for assessment of safety during licensing are described in the provisions of the "Decree on Licensing of Nuclear Installations, 1983". According to the Decree, licensing procedure is initiated by the application of the owner to be recognized as such. Licensing process for an NPP comprises three main stages in succession: Site License, Construction License and Operating License.

There are also several permits functioning as hold points during the licensing process, such as limited work permit, commissioning permit, permit to bring fuel to site, fuel loading and test operations permit for operating license, etc.

The general procedures for review and assessment of TAEK are laid out in the Decree. According to this general process, TAEK may request further information related to safety for review and assessment at any stage whenever it deemed necessary. The application documents are reviewed and assessed by DNS. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014. TSO will perform review and assessment during licensing of Akkuyu NPP first unit. The same documents are also reviewed by ACNS independently to provide DNS for an additional opinion about safety issues. Safety Evaluation results are reported to the AEC for review and granting a license if found satisfactory.

The purpose of the review and assessment work by TAEK is to determine if the applicant has demonstrated that the safety goals and criteria are met by the proposed design in its reports. Details of the licensing process and review and assessment activity are regulated by internal guidelines. Main internal document in this subject is the Directive on Establishment and Implementation of Licensing Projects. This directive provides provisions on the mechanism to establish and implement licensing activities for nuclear installations under project management approach. The directive envisages two main processes to follow: Review and Assessment, and Inspections. Both topics are also regulated by two internal guidelines.

1. According to directive on review and assessment process for nuclear installations are performed in different levels: Level 1 R&A is implemented mainly to check the adequacy of the application; and format and content of the documents submitted with the application,
2. Level 2 R&A is broad review and assessment and implemented mainly to check the suitability of the information provided in the documents for independent assessment; consistency of the information provided; and compliance with the regulations,
3. Level 3 R&A is detailed review and assessment and implemented mainly to check if the structures, systems and components are classified adequately in terms of safety and quality classes; if their technical specifications, their environmental qualification and their safety functions are properly addressed and in conformity with the relevant codes and standards; and to check if the accident analyses are performed using adequate method and tools; if assumptions and inputs are suitable; if the results are in conformity with the regulations and acceptance criteria. Also this level includes independent repeat of some of the accident analyses if deemed necessary,

The review and assessment process is always supported by regulatory inspection and enforcement activities at any stage of licensing and throughout the lifetime of a nuclear installation.

11.1 SITE LICENSE PROCESS

In site license process (Chapter 14 "Siting" explains this process in detail), a site report containing information on a potential site for a nuclear installation submitted by the owner is reviewed and assessed for compliance with national regulation and IAEA guidelines to grant the Site License. After having studied the results of the inspections performed by the TAEK at the proposed site, the DNS, prepares site evaluations report which also includes the views of the Committee. The Vice President of Nuclear Power and Safety submits a report to the President of the TAEK indicating the results of the site evaluations report and work realized.

The President of the TAEK takes the site evaluation report together with the report prepared by the Vice President to the first meeting of the Commission. If the Commission does not find the site evaluation report adequate, The Commission is entitled to send the report back for re-evaluation or, if necessary Commission consults with experts and then issues its decision. The decision is released to the applicant by the TAEK. An affirmative notification is called site license. The conditions of the license are given to the applicant as an appendix to the license.

Following the receipts of the site license, the applicant may proceed with the work related to site preparation, potable water and electricity supply, road and harbour construction etc. and buildings other than the nuclear reactor facility itself. Then the applicant may perform the detailed site investigations and submit their results and the final values of the site related design parameters to TAEK for approval prior to the application for construction license.

11.2 CONSTRUCTION LICENSE PROCESS

To obtain a construction license, the applicant must have obtained a site license and has to apply to the TAEK enclosing the PSAR to his application. According to Decree the PSAR must include the following information:

1. New information related to site and its environment acquired after the issuance of site report,
2. Safety Principles, criteria and standards to be applied for the design construction, quality assurance, commissioning, operating and decommissioning of the facility,
3. General characteristics of the facility and layout and design bases for structures, systems and components,
4. List giving seismic safety and quality classifications of structures, systems and components,
5. Information related to the design of the process and safety systems of the facility,
6. Design and layout provisions for radiation protection and radioactive waste management in-service inspection maintenance during operation and decommissioning,
7. Safety analysis of the facility during normal operation, anticipated operational occurrences and accident conditions,
8. Quality assurance program comprising information on its objectives, description, organization and implementation,
9. Information on technical capability, know-how, experience and organizational structure for the applicant and vendors related to the project,

10. Preliminary information on commissioning,
11. Other additional information which may be requested in the light of developments and new practices in nuclear safety.

PSAR of the installation and several other supportive documents are reviewed and assessed to verify the safety of design as a prerequisite to Construction License. Following the assessment of the PSAR, the DNS prepares a limited work permit evaluation report which also includes the view of the Committee. The Vice President for Nuclear Power and Safety submits a report to the President of the TAEK including the conclusions of the limited work permit evaluation report and the summary of the work realized.

The president of the TAEK takes the limited work permit evaluation report together with the report prepared by the Vice President to the first meeting of the Commission. If the limited work permit report is not found appropriate by Commission it may be returned to the TAEK for further studies. If necessary, the opinions of experts may be sought on this respect. When it is established that the protection measures are adequate and that the facility can operate without harming the safety and the health of the public the Commission may decide to grant a limited work permit. The decision is released to the applicant by the TAEK. An affirmative notification is called limited work permit. The applicant, who has obtained a limited work permit, may proceed with the installation of structural foundations of reactor and environmental safety related buildings and facilities and construction of other structures, systems and components.

Following the granting of the limited work permit, the evaluation of the PSAR, in connection with the construction license, proceeds. After having observed the carried out at the reactor site by its inspectors the DNS prepares a construction license evaluation report which includes the views of the Committee. The Vice President of Nuclear Power and Safety, submits to The President of TAEK a report having the conclusions of the construction license evaluation report and the summary of the work carried out in this context.

The President of the TAEK presents the construction license evaluation report together with the report prepared by the Vice President to the first report adequate it is entitled to send it back for further studies. If necessary the opinions of experts may be sought in this respect. The final decision comprising the subjects to be added to the Final Safety Analysis Report (FSAR), is released to the applicant by the TAEK. The construction license authorized the applicants to start with the constructions of all structures and the erection of all the systems of nuclear reactor facility. During construction, regulatory inspections are used to ensure that the installation is built as designed.

11.3 OPERATING LICENSE PROCESS

The review and assessment of the FSAR together with supportive documents listed in the Decree to verify safe operation of installation is the basis for issuing the Operating License. The Operating License is granted in three steps:

1. Commissioning Permit,
2. Fuel Loading and Pre-Operational Test Permit,
3. Full Power Operating Permit and Operating License.

For Commissioning Permit following documents have to be enclosed with these applications:

1. The final design of the components and systems,
2. Documents related to quality assurance and control of said components and systems,
3. Commissioning program,
4. Pre-service examination,
5. Documents related to the adequacy and organization of commissioning personnel,
6. Preliminary information on operational limits and conditions,
7. Operating instructions and procedures for the components and systems,
8. Other additional information which may be requested in the light of developments and new practices in nuclear safety.

Following the evaluation of documents listed below and reports of inspections, tests carried out during the construction period including the recommendations of the Committee by the DNS, the TAEK may grant the commissioning permit. It is not allowed to transport to the reactor site the nuclear fuel and heavy water with nuclear fuel for heavy water reactors before the documents pertaining to the physical protection program of the nuclear reactor facility, nuclear material accounting and control, and procurement, transportation, storage, accounting and control of heavy water for heavy water type reactors have been presented to the TAEK and its approval is obtained.

In order to obtain Fuel Loading and Pre-Operational Tests permit applicant must be apply to the TAEK enclosing the documents listed below and the FSAR:

1. Information related to results and evaluations of tests carried out during the commissioning of the nuclear and environmental safety related components and systems,
2. Quality assurance documents of the facility and quality assurance program for operation,
3. Document affirming competence and organization of the operating personnel,
4. Program of fuel loading, criticality and pre-operational tests,
5. Preliminary information on operating limits and conditions,
6. Operating instructions and procedures for the nuclear reactor facility,
7. Radiation protection program,
8. Emergency plans,
9. Other additional information which may be required in the light of development and new practices in the nuclear safety.

After having evaluated the documents required above and the inspection reports pertaining to the testing during the commissioning period of the components and systems by the DNS including the recommendations of the Committee, the TAEK grants the fuel loading and preoperational test permit.

To obtain a full power operating permit and operating license the applicant has to apply to the TAEK enclosing the documents listed below:

1. Results and evaluation of fuel loading, criticality, and pre-operational tests,
2. Final information regarding operational limits and conditions,
3. Instructions and procedures pertaining to the final status of matters,
4. Other additional information which may be requested in the light of developments and new practices in nuclear safety.

After having studied documents requested and reports pertaining to the inspections, DNS

prepares an evaluation report for full power permit and operating license. The recommendations of the Committee are also taken into the consideration in this report. The Vice President for Nuclear Power and Safety presents a report to The President of the TAEK containing the conclusions of the report and summary of related activities. Together with the report of DNS, the President of the TAEK forward the report prepared by the Vice President to the first meeting of the Commission. The Commission is entitled to send the report back to the TAEK for a review, if it is not found satisfactory. If it feels necessary expert recommendations may be sought. The decision of the Commission is released to the applicant by the TAEK. An affirmative notification is called a full power permit and operating license.

12 RADIATION PROTECTION (ARTICLE 15)

12.1 REGULATORY REQUIREMENTS

According to Decree on Licensing of Nuclear Installations dated 1983, the applicant must have obtained a site license from TAEK prior to the application to obtain a construction license. The applicant also has to apply to the TAEK for construction license by enclosing the Preliminary Safety Analysis Report (PSAR) to the application.

The decree defines the information to be provided in the PSAR. According to the decree, the PSAR shall include design and layout provisions for radiation protection, radioactive waste management, in-service inspection, maintenance during operation and decommissioning.

The decree also stipulates that the final radiation protection program should be submitted during the application for fuel loading permit.

Public dose constraints are determined by TAEK and dose constraints for workers are determined, monitored and controlled by the Operator according to the Regulation on Radioactive Waste Management (Reg. on RWM).

Release limits shall be determined by the authorized person for gaseous and liquid wastes separately, based on optimization of radiation protection as well as dose constraints which are determined by the Authority for the public on the bases of plant conditions. Release limits in nuclear facilities should be presented to TAEK in the authorization application for construction and operation. In the authorization phase sufficiency of these limits are evaluated by TAEK.

Final values are considered within the scope of operating limits and conditions of the plant.

Environmental monitoring program shall be carried out in the facilities which yearly maximum doses received by critical groups exceed 10 μSv in the operation conditions. The authorized person is obliged to ensure; monitoring and recording of dose rates in the environment continuously; and monitoring and recording activity concentrations in air, water, soil and various food samples in regular intervals.

Licensing approach of TAEK is defined in the "Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012", which lays out the provisions for establishing a licensing basis for NPPs. These provisions state that the issues insufficiently addressed by the existing Turkish legislation on nuclear safety shall be covered by requiring compliance with the regulations of the vendor or designer country and the IAEA safety documents, particularly, safety fundamentals and safety requirements. For remaining issues, third party country legislations and standards are referenced. The directive also requires the applicant to submit the regulatory body a reference plant of the proposed design for facilitating the licensing process.

The draft regulation on radiation protection for the nuclear facilities has been matured having taken comments of different stakeholders. The regulation is planned to be put into force in 2016. Dose limits, dose criteria for accidental conditions, obligations of licensee on radiation protection, public dose estimation, radiation protection programme (classification of areas, workers, individual monitoring, etc.) and recording requirements are all regulated in the document.

The PSAR shall include a chapter defining the organization for radiation protection,

measures for radiation protection taken in plant design, the roles and responsibilities of personnel with respect to radiation protection and safety as well as the means and provisions to implement the respective actions.

Skill requirements in the area of radiation protection have been identified. TAEK has ongoing plans regarding Human Resource Development to address these requirements. In this regard, IAEA mission on R&A of Radiation Protection Chapter of SAR and several trainings provided by the technical support organization (TSO) were arranged.

12.2 OPERATIONAL CONTROL AND RADIATION PROTECTION PLAN FOR AKKUYU NPP

The agreement on the Akkuyu Project defines the scope of responsibilities of the Akkuyu Project Company (APC) for the project. The means and provisions for radiation protection are included within the scope of the APC's responsibilities. A description of the Radiation Protection systems and relevant basic equipment is presented in the project documentation of the Reference Plant and these are expected to be submitted in the PSAR of the Akkuyu NPP.

The measurements to estimate the existing natural radiation background have been performed and documented in the framework of Engineering Studies Program of the siting work. Background radiation and the doses which are to be incurred from the background radiation were presented in the Environmental Impact Assessment Report (EIAR). Affirmative decision was made for the EIAR at the end of 2014.

During the operation of the Akkuyu NPP Units, radiation monitoring of the units and the environment will be performed by the operating organization. The monitoring program will include source, environmental, individual monitoring and dose assessment as follows:

- Monitoring in the premises of the NPP (on-line monitoring, and radiation dose rate monitoring, control of releases, contamination control, dosimetry control); monitoring of the physical barriers,
- Monitoring of gaseous releases and liquid discharges from the plant using the Automated System of Radiation Monitoring on site (source monitoring),
- Environmental monitoring of the impact area during normal operation and accident (Environmental Automated Radiological Monitoring System - EARMS); environmental sampling for specific activity of radionuclides in contaminated air, soil, water, local ecosystems, foodstuffs and other possible pathways of public exposure.

The APC is responsible for establishing a radiation protection plan, which includes procedures aimed at systematically meeting the corresponding regulatory documents on radiation protection and As Low as Reasonably Achievable (ALARA) principle. The radiation protection plan is to be a part of Final Safety Analysis Report (FSAR) which will be submitted for fuel loading permit according to the Decree.

Responsibilities for personnel training and implementation of radiation protection requirements rest with the APC. The APC has plans for staffing. Skill requirements for radiation protection personnel are to be addressed in the PSAR.

13 EMERGENCY PREPAREDNESS (ARTICLE 16)

13.1 EMERGENCY PLANS AND PROGRAMMES

Basic legislative documents on emergency preparedness and response are listed below:

- The Law on the Organization and Duties of Disaster and Emergency Management Presidency (AFAD) (2009),
- Regulation on National Implementation for Nuclear and Radiological Hazard Situations (2000),
- Regulation on Disaster and Emergency Management Centers (2011),
- Regulation on Tasks Regarding Chemical, Biological, Radiological and Nuclear Hazards (2012),
- Regulation on Disaster and Emergency Response Services (2013),
- National Disaster Response Plan (2014),
- National Radiation Emergency Plan (pending for ratification).

13.1.1 NATIONAL COORDINATING AUTHORITY FOR EMERGENCY PREPAREDNESS AND RESPONSE

Disaster and Emergency Management Presidency (AFAD) is the coordinating authority assigned for all kinds of disasters and emergencies at all levels including large scale nuclear and radiological emergencies. AFAD has its own Disaster and Emergency Management Center (DEMC) like all the stakeholders which have role in emergency response according to the related regulation. AFAD (DEMC) is operated on a 24/7 basis.

Prime Ministry - Disaster and Emergency Management Centre (PM-DEMC) is activated within AFAD-DEMC on an ad-hoc basis with the order of the President when effective response, coordination and collaboration in national level are required for management of emergencies. All the responsible authorities take part in PM-DEMC, related to particular emergency.

Disaster and Emergency High Council has been established and the Council meetings are chaired by the Prime Minister or one of Deputy-Prime Ministers to be appointed by him. The is composed of ministers of National Defense, Interior Affairs, Foreign Affairs, Finance, National Education, Health, Transport, Maritime Affairs and Communications, Energy, and Natural Resources and Environment and Urbanization.

The Council is responsible for approving plans, programs and reports prepared in relation to disasters and emergencies. The Council may invite concerned ministers, organizations and institutions, representative of non-governmental organizations (NGOs) and experts on the matter to its meetings. The Council gathers at least twice a year. The council may also gather upon the request of the Council Chairman.

Disaster and Emergency Coordination Council: Disaster and Emergency Coordination Council has been established under the presidency of Undersecretary of the Prime Minister, and it is composed of ministers of National Defense, Interior Affairs, Foreign Affairs, Finance, National Education, Health, Transport, Maritime Affairs and Communications, Energy and Natural Resources, and Environment and Urbanization, Development, Director-General of Disaster and Emergency Management, Director-General of Turkish Red Crescent and senior managers from other ministries and organizations to be assigned by the Chairman

of the Council according to the type of the disaster or emergency.

The objectives of the Council are to evaluate information in the event of disasters or emergencies, to specify the measures to be taken, to facilitate and supervise their implementation and to provide coordination among organizations, institutions and NGOs. The Councils gathers at least four times a year. Besides, when needed, the Council may hold an emergency meeting upon the call of the Chairman of the Council.

Provincial Disaster and Emergency Directorates, which are affiliated with AFAD, were established within the body of governorships in provinces. Their duties related to disaster and emergency management are;

- To determine disaster hazards and risks of the province (hazard assessment),
- To prepare and implement provincial disaster and emergency plans in collaboration and coordination with local administrations and public institutions and organizations,
- To manage provincial disaster and emergency management centers (Provincial-DEMC),
- To determine damages and losses suffered in the case of disasters and emergencies,
- To establish and manage warehouses for storing necessary search and rescue materials, food, tools, equipment and materials to be used for satisfying the needs of public for sheltering, nutrition and health services in cases of disasters and emergencies,
- To perform the duties related with mobilization and civil defense services in the province according to the relevant legislation,
- To manage services for determining, identifying and decontaminating chemical, biological, radiological and nuclear agents, and providing collaboration and coordination among relevant organizations.

13.1.2 NATIONAL REGULATORY BODY

The mission of the Turkish Atomic Authority (TAEK) is to lead the way for ensuring that Turkey benefits from nuclear technology and to undertake regulatory and inspectorial activities.

TAEK is recognized as the “warning point” and the “competent authority” by the IAEA according to Convention on Early Notification of a Nuclear Accident and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency. TAEK has its own disaster and emergency center (TAEK-DEMC). The emergency preparedness and response activities of TAEK are coordinated from TAEK-DEMC which also acts as the national warning point.

TAEK responded to all the radiation emergencies which took place in the past. The new preparedness and response infrastructure was established with the foundation of AFAD Presidency. TAEK will provide technical consultancy in case of major radiation emergencies within the Prime Ministry Disaster and Emergency Management Center in this new framework. TAEK is also one of the support solution partners of the CBRN service group which has been established within the frame of National Disaster Response Plan.

TAEK began establishing its own early warning environmental radiation monitoring system network throughout the country after Chernobyl accident. Data acquired from the network are received and evaluated in the TAEK-DEMC. Monitoring stations are densely deployed at locations close to national borders, Metsamor NPP and around sites where the nuclear power plants are planned to be constructed. The number of the stations has currently reached to 193.

TAEK also has atmospheric dispersion calculation capabilities. The study for adaptation of the decision support system JRODOS to Turkey is in progress.

Besides, TAEK has emergency response and monitoring vehicles and airborne monitoring capability.

13.1.3 NATIONAL EMERGENCY PLANNING FRAMEWORK

The roles and responsibilities of ministries, related institutions and governorships are defined in the national legislation. National Disaster Response Plan (NDRP) was issued in 2014. The NDRP is the highest-level overarching plan that covers all the hazards.

28 service groups are designed in the NDRP. Each service group is dedicated to a specific service which may be required in case of emergencies. The organizational scheme of the services and the service groups defined in the NDRP are presented in Figure 7.

The ministries and institutions which are main solution partners are indicated underneath the names of service groups in the figure. The services are provided at provincial level by the directorates of the ministries and institutions at national level.

Based upon the Regulation on Disaster and Emergency Response Services and National Disaster Response Plan (Figure 6), National Radiation Emergency Plan (NREP) was prepared by TAEK in collaboration with AFAD. The NREP is pending for ratification of the Disaster and Emergency High Council and is expected to be put into force soon. The preparation process was carried out transparently and the comments of and inputs from the related stakeholders were taken into consideration.

The most recent approach of the IAEA on emergency preparedness and response was adopted and international practices were taken into account.

NREP is an event-type plan according to the National Disaster Response Plan. The roles of ministries, institutions and service groups set forth in the legislation are elaborated in the plan. For radiation emergencies, service groups which are expected to be directly involved in the response are indicated with trefoil symbol in Figure 7.

The emergency command and control system and the transition of responsibilities during an emergency is specified in the NREP. The plan covers;

- Terminology specific to radiation emergencies,
- Legal bases,
- The ministries, institutions and service groups that will take part in response in radiation emergencies,
- Planning bases (hazard assessment),
- Responsibilities of related parties;
- Response organization,
- On- and off-site emergency management centers and locations,
- Occupational concepts (ideal responses);
- Training, drills and exercises;
- International authorities and conventions,
- Technical guidelines:
  - Hazard assessment,
  - Generic criteria,
  - Operational intervention levels,
  - Guidance values for restricting exposure of emergency workers,
  - Use of thyroid blocking agents,
  - Response time objectives,
  - Dangerous sources.
- Emergency planning zones, emergency planning distances and areas to be cordoned,
- Teams and facilities required for response.

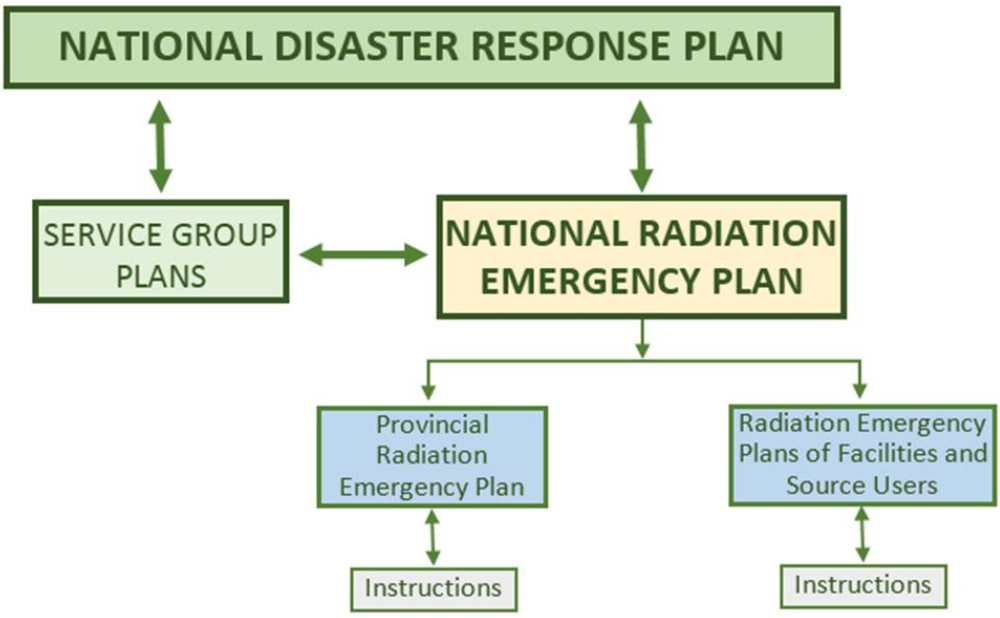

Figure 6. The National Emergency Planning Framework

13.1.4 CLASSIFICATION OF EMERGENCIES

The emergencies that may take place in NPPs shall be classified by the operating organization taking the Emergency Action Levels (EALs) into consideration. The EALs will be derived specific to each plant type by the license holders and reviewed by TAEK.

Based on the classification, the Operator shall notify and continue providing updated information to the off-site decision makers responsible for the respective protective actions.

13.1.5 ON- AND OFF-SITE PLANS FOR AKKUYU NPP

The Akkuyu Project Company (APC) is responsible for developing the on-site emergency plan which determines the required actions for mitigation of the accident consequences whilst respective governmental organizations (Mersin Governorship which is supported by AFAD and TAEK) will prepare the provincial radiation emergency plan.

The on-site emergency plan will provide clear and straight forward interface with the off-site decision makers. The necessary procedures will be identified, developed and agreed with the responsible officials prior the commissioning of the Akkuyu NPP.

After the on-site emergency plan is developed it shall be submitted to TAEK for review and approval prior to the fuel loading to the first reactor at the site. TAEK will evaluate the on-site plan and consistency of on-site plan with the off-site plan according to the related decree and regulations. The full-scale exercise for each NPP should be conducted before the fuel loading and pre-operational test permit is granted by TAEK.

The plan shall be revised and updated periodically and also if specific circumstances require these changes.

13.1.6 THE EMERGENCY MANAGEMENT FACILITIES AND LOCATIONS

The emergency facilities and locations suggested by the IAEA and related provisions are adopted in the NREP. The APC and TAEK have reached a common understanding regarding the on- and off-site emergency facilities and locations. TAEK is preparing a draft protocol which includes technical terms for the off-site emergency center to support the governorship. The center is planned to be established as a township disaster and emergency management center and integrated to the national framework.

The on-site emergency facilities except the backup control room can be collocated under the same roof.

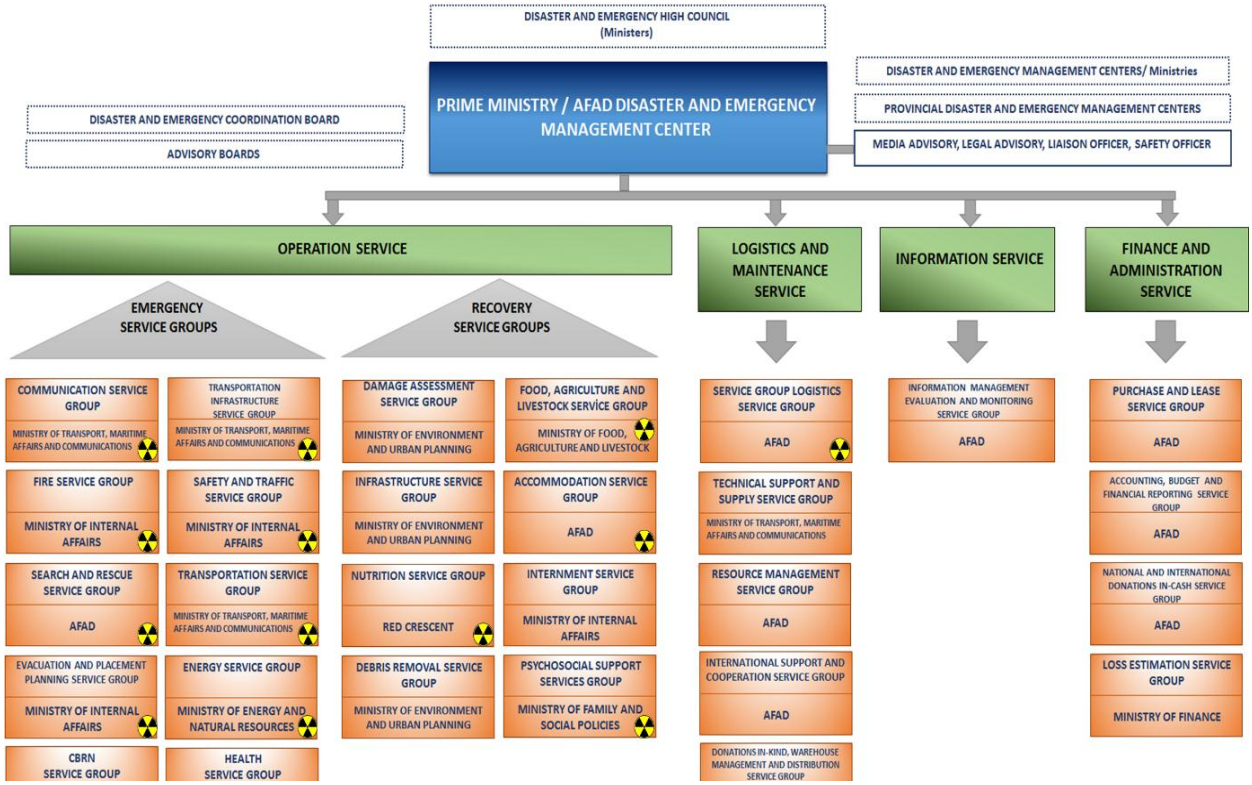

Figure 7.Organization Defined in the National Disaster Response Plan

13.2 INFORMATION TO THE PUBLIC AND NEIGHBOURING STATES

Turkey is a party to the early notification and assistance conventions. The infrastructure for communication channels such as phone lines, facsimile facilities, computer and internet facilities which are to be used for communication with IAEA and other parties, are in place. TAEK is recognized as the competent authority for communication with IAEA.

Turkey has bilateral agreements with Bulgaria, Romania, Ukraine, and Russian Federation on early notification in case of nuclear emergencies.

Provision regarding public information, including the public information center and responsible authorities are included in the NREP.

The radiological monitoring results acquired from the RESA stations are published on TAEK's website and shared with the European countries via European Radiological Data Exchange Platform.

Due to the fact that the Armenian NPP is close to the eastern border of Turkey, some areas in the region are considered as critical locations, vulnerable to possible radiological consequences, where urgent protective measures shall be taken in case of an accident.

A full-scope exercise is planned to be conducted in Igdir province which is the closest city to the Metsamor NPP with the participation of national and local authorities in the last quarter of 2016.

13.3 EMERGENCY PREPAREDNESS FOR CONTRACTING PARTIES WITHOUT NUCLEAR INSTALLATIONS

The governorship of Iğdır province which is the closest city to the Metsamor NPP and whose territory is in category V is been being supported by TAEK and AFAD for ensuring necessary preparedness. The template for provincial radiation emergency plan for Iğdır province was prepared by TAEK in collaboration with AFAD. The governorship and provincial disaster and emergency management directorate were informed about the necessary resources, tasks to be performed and exercises. Preparation studies for conduct of a full-scope exercise in Iğdır in the last quarter of 2016 are in progress.

14 SITING (ARTICLE 17)

14.1 EVALUATION OF SITE RELATED FACTORS

14.1.1 SITE SELECTION AND RANKING METHODOLOGY

The site selection methodology in Turkey is formed in accordance with national regulations and international practices. The methodology is based on screening of candidate sites. Sites are evaluated considering 43 siting criteria grouped into four major categories: Economic, Engineering, Environmental and Sociological. A ranking is assigned from 0 to 5, for each criterion with the quantitative ranking metrics in evaluation process.

The siting process for an NPP generally consists of an investigation of a large area to select one or more candidate sites and finally identifying preferred site or sites. The site survey process commonly begins with delineating the region of interest and proceeds through first three steps. Later on those candidate sites are investigated in detail. Last step belongs to the site selection process.

In order to determine the interested area(s), some site characteristics are considered with the aim of rejecting unacceptable areas or sites. Most generally, the experts of the utility can easily decide about the interested areas. In this phase some near region characteristics may play a certain role to determine the area(s). For instance, Turkey is a country having active seismic zones. Therefore, the earthquake is the main factor in the selection of NPP sites. Thus, if the probable site is on a seismically active region, those areas on that region shall not be considered. According to regulations; nuclear power plants shall not be located on sites directly situated on active faults. No airport shall be located within an area of 10 km radius centred at the installation. No take-off, landing or holding airspaces shall be located over the same area. No air traffic corridor shall pass over an area of 5 km radius centred at the installation. Ground motion level under free soil surface acceleration can't be used no less than 0.15 g. All events identified as design basis external events (DBEE), should be examined and analysed in detail and their parameters which will be based in the design of the plant should be definitely established. Despite the reduction of the intensity and probability of the events, use of engineering safety features in the design and strengthening of the plant structures, if the risks associated with DBEE in terms of plant safety are not acceptable the site shall be deemed unsuitable.

Likewise, cooling water source of the nuclear reactor is also inevitable major factor for the site selection from the both safety and economical point of view. If the cooling water is not enough for the once through cooling, cooling towers should be used that will affect the reactor cost. The basic methodology for the siting is given in Figure 8. According to the regulation on Environmental Impact Assessment, owner has to prepare and submit to the Ministry of Environment and Urbanization (MoEU) an Environmental Impact Assessment report (EIA) at the planning stage. The environmental aspects of the proposed installation which cover alternative sites are evaluated by this Ministry.

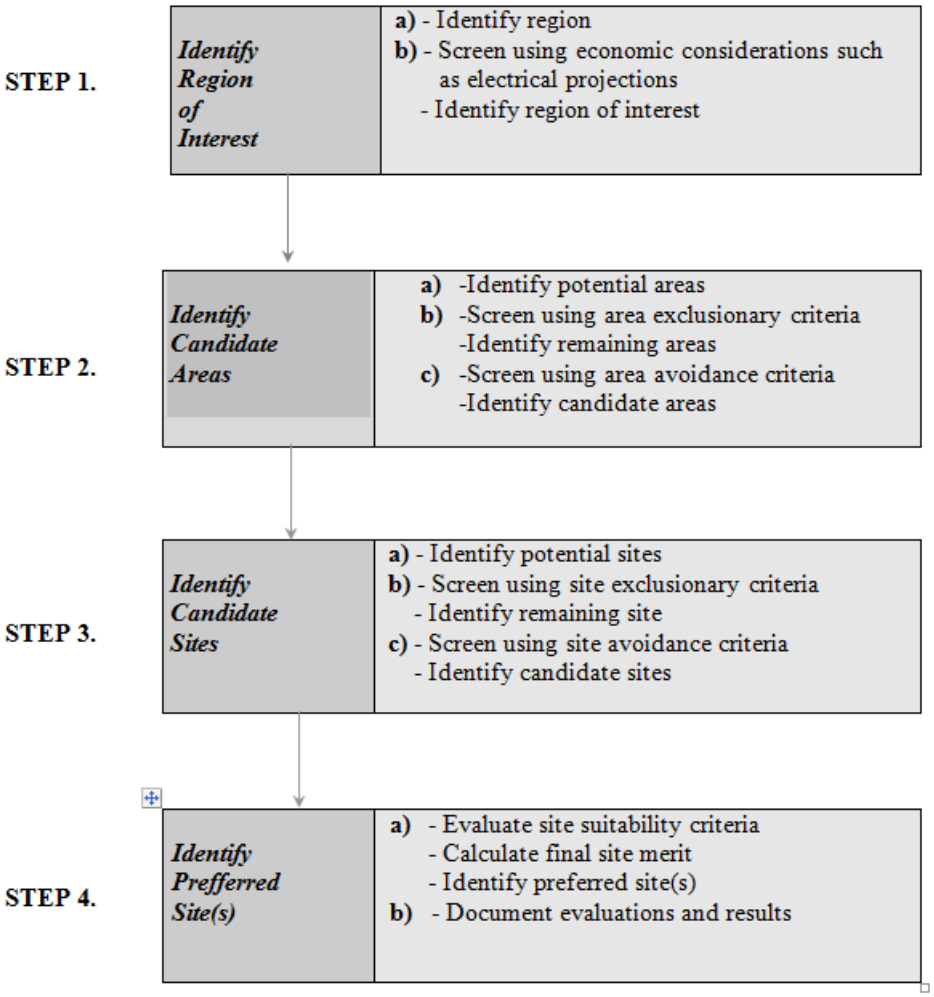

Figure 8.Basic Methodology for the Siting

14.1.2 REGULATIONS ON SITE STAGES

Licensing decree has a main role for licensing of NPPs as it defines all licensing stages and the application sequence. In addition the "Regulation on Nuclear Power Plant Sites", "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008" and the draft "Regulation on Nuclear Installation Safety" require that the site of a nuclear installation is determined by taking into account the effect of the site to the NPP, the effect of the NPP to the site and the applicability of the emergency plans. Applicability of emergency plans is also evaluated and planning zones are determined accordingly. Details are given in the "Regulation on Nuclear Power Plant Sites". In this Regulation the fundamental issues are based on IAEA Safety Requirement NS-R-3. The draft "Regulation on Nuclear Installation Safety" requires surveillance and re-evaluation to be performed to ensure continued acceptability of site conditions. Guideline on Format & Content of NPP Site Report provides guidance for developing the site report.

14.1.3 LICENSING OF SITES

In order to construct an NPP, it is compulsory to obtain a license from the Authority (TAEK). The NPP licensing process is carried out in accordance with the Decree on Pertaining to Issue of Licences for Nuclear Installations. The licensing process for a nuclear installation is

being conducted in three phases; site license, construction license and operating license.

Owner notifies TAEK before site investigations, after beginning of site investigations TAEK performs inspections on site. According to tentative schedule, period up to site license application is two years. Application document for site license is site report and a special format is given to the applicant to facilitate preparation of site report. The site report shall cover:

- Information regarding the purpose of the nuclear reactor facility, its power and the type of reactor,
- Information regarding the technical capability of applicant and institutions carrying out site studies on behalf of the applicant,
- Regional map clearly indicating the geography of the proposed site,
- Information and studies regarding topographical, geological, geotechnical hydrological, seismological and meteorological characteristics of the selected site,
- Layout alternatives for the reactor types considered,
- Information about the site evaluation with respect to natural phenomena such as earthquakes, floods and storms,
- Information about the site evaluation with respect to man-made external events such as aircraft crashes, fires, explosions and failure of dams, etc,
- Information regarding the adequacy of water sources to be used for cooling purposes,
- QA program for detailed site investigations,
- Information regarding the national electrical grid connection and reliability of the off-site electrical power,
- Preliminary studies on radiation exposure of the public due to liquid and gaseous radioactive effluents during normal operations, anticipated operational occurrences and accident conditions,
- Information regarding effects of ecology to the NPP such as measures against biological fouling, etc,
- Other additional information which may be requested based on the developments and new practices on nuclear safety.

With this report, it has to be shown that any site characteristic shall not preclude technologically the construction of a safe NPP at the proposed site, and those site parameters significant to safety must be within acceptable limits from the latest technological applications.

Following the submission of site report, review and assessment is conducted, this period is approximately six months.

Coordination of licensing process is conducted by a vice president of TAEK and DNS. Review and assessment is conducted by Site Group in DNS. Technical support is taken generally from universities as Consultants; there is ACNS (generally from universities, 9 members) and IAEA Missions as an independent review. After all reports taken, a Site Evaluation Report (SER) is prepared by DNS and site license conditions are identified. This is submitted via Vice president and president to AEC and decision is given by AEC.

As the site license is granted then applicant may start following activities;

- Site preparation, water and electricity supply, road and harbour construction etc,

- Construction of buildings and installations other than nuclear reactor facility itself.

EIA affirmative decision is prerequisite before site license. MoEU is the responsible body for EIA process. A Public participation meeting is organized by the owner of the project, at the place where the project is planned to be realized, on a date to be determined by agreement with the Ministry, in order to inform people of the investment and to obtain their views and suggestions. In the EIA process, TAEK contributes on radiological part of EIA report and relevant issues.

Upon acquiring site license, detailed site investigation results and exact values of site related project parameters are submitted for approval of TAEK by licensee. After this approval owner can apply for construction license with PSAR.

14.1.4 NPP SITES

Turkey has two identified NPP sites. One is Akkuyu and the other is Sinop. Locations of both sites can be seen in Figure 9.

Figure 9.NPP Site Locations

14.1.4.1 AKKUYU SITE

Akkuyu Site license had been issued to Turkish Electric Company (TEK) in 1976. The site license is still valid and transferred to APC, in accordance with the Akkuyu Project Agreement. However, TAEK requested APC to update site related studies and prepare an updated site report since current project is different than the project which was supposed to be built in 1976 as well as site characteristics and parameters were determined in 1970s.

APC is recognized as the Owner on February 7th, 2011. The Akkuyu Site on the Mediterranean coast was allocated to APC in 2011 as specified in the Akkuyu Project Agreement. Although the site license has already been granted in 1976 an update of the site report was required both because of the regulatory framework and international practice evolved and also because of the need to incorporate the site data gathered after 1976. APC started site investigations in Akkuyu for updating the site characteristics and

parameters according to the Decree on Licensing of Nuclear Installations, 1983 and other related legislation.

The Updated Site Report that addresses the site license validity was prepared by APC and submitted to TAEK in May 2012. Review and assessment conducted by Site Group, ACNS and IAEA and positive decision for USR was given in December 2013. Site Parameters Report (SPR) submitted in November 2014. The Updated SPR (Rev 2) that addresses the site license validity was submitted to TAEK in December 2015.

Within the framework implemented studies all the siting requirements and the necessary characterization studies have been addressed.

a) Integration into the grid- The site has been evaluated for connection to the national 154 kV and 380 kV transmission distribution systems. Turkish Electricity Transmission Co. Inc. (TEIAS) has been assigned the project to design and construct the transmission lines from the terminations of the NPP switchyard to a selected substation. Design and construction of the NPP switchyard is part of the scope of the project under APC responsibility,

b) Geology and Tectonics – The geology and tectonics of the site has been investigated in compliance with TAEK regulations and also the IAEA Safety Guide SSG-9. In particular the four scale approach (regional, near regional, site vicinity and site area) has been used to identify all relevant geological and tectonic structures. Using the criteria recommended in SSG-9, it has been demonstrated that there is no potential for fault displacement hazard at the site which can jeopardize the safety of the NPP structures, systems and components. Seismology - The seismological database included paleoseismology, archeo-seismology, historical seismology, instrumental seismology and the monitoring of earthquakes in the near region and site vicinity. Requirements of TAEK regulations and recommendations of the IAEA Safety Guide SSG-9 have been followed. The complete methodology and approach was included in the Updated Site Report. The results which include the seismic design bases for the NPP are reported in the Site Parameters Approval Report,

c) Heat removal capability – The Mediterranean Sea will be the main source of cooling including the Ultimate Heat Sink. Subjects related with plant efficiency and sea water temperature have been studied. Furthermore, the potential for low water during extreme oceanographic events (such as tsunamis) have been evaluated. The final design bases for the NPP are provided in the Site Parameters Report,

d) Hydrology - This topic includes potential hydrological hazards and also the availability of fresh water for construction and plant use during operation. It also includes dispersion of effluents in aquatic media. The studies confirmed that the nearby creeks and streams do not pose a hazard for flooding the NPP site. Comprehensive coastal flooding investigations were conducted (including tsunamis, seiches, storm surges, tides, waves and sea level rise due to global warming). The principle of a “dry site” will be used for protection from coastal flooding as recommended in IAEA Safety Guide SSG-18. The methods used were reported in the Updated Site Report. The final design bases for the NPP are provided in the Site Parameters Report. Dispersion of effluents (including radioactive and non-radioactive substances and thermal effects) in aquatic media is discussed in the

USR, SPR and also the EIA Report. The availability of fresh water for construction and operation of the plant was being studied as part of preparatory site and engineering works,

e) Demography – The demographic situation of the site was discussed in reports and emphasis was given to the feasibility of emergency planning given the present and projected population near the site,

f) Meteorology - This topic includes potential meteorological hazards and the dispersion of effluents in atmospheric media. The extreme meteorological hazards at Akkuyu include storms, heavy precipitation (impacting hydrological events), extreme heat (air and water), lightning and small tornadoes and waterspouts. All these hazards have been evaluated using the IAEA Safety Guide SSG-18. The methods used were reported in the Updated Site Report. The final design bases for the NPP are provided in the Site Parameters Approval Report. Dispersion of effluents in atmospheric media was discussed in reports,

g) Environmental Issues – APC has submitted an Application Dossier to MoEU in 2011. On the basis of this Dossier, the MoEU selected a panel of experts who prepared a detailed Table of Contents (TOC) for the EIA Report. This TOC includes the evaluation of all (radiological and non-radiological) impacts. It also includes all external hazards that could affect the safety of the installation. The EIA Report has been submitted to MoEU in July 2013 and affirmative decision was given December 2014,

h) External Hazards – Natural external hazards were already addressed under subject matter items (b, c, e, g). Human induced hazards have been evaluated using the recommendations of the IAEA Safety Guide NS-G-3.1. The sources of potential hazards include airplane crash and explosion of oil/gas tankers in the Mediterranean Sea. There are no acceptability issues related to these hazards,

i) Local Infrastructure - The Project Site is located in the south of Turkey in the Akkuyu Bay, which is located in the Büyükeceli Municipality of Gülnar District of Mediterranean Sea Region Mersin Province. It is at approximately 37 km southwest from the center of the Gülnar District; 140 km westward from the city center of Mersin Province. The area within a 50 km radius of the site is a low population area with the primary industries being agriculture and tourism. APC has developed plans to establish on the site the necessary wharfs for the receipt of equipment and materials by sea and for fabrication and construction facilities. APC has developed plans for a permanent residence facility near the project site for the housing of personnel that will operate and maintain the Akkuyu units and also has provision for developing on the project site a large scale temporary housing complex for the construction workforce. Layout of Akkuyu NPP is given in the figure below:

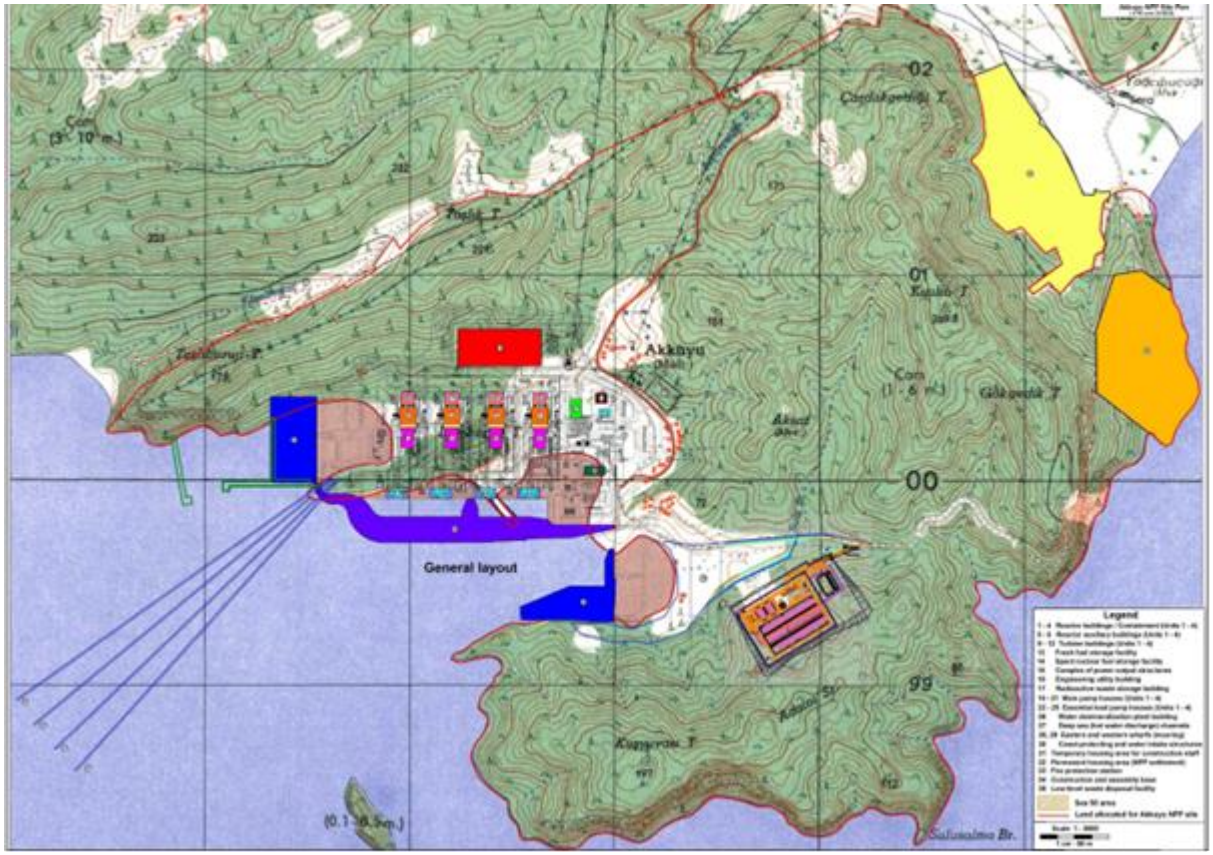

Figure 10.Layout of Akkuyu NPP Site

j) Access - Large-tonnage cargoes will be unloaded and processed in the local port intended in Akkuyu site. The site is connected to the major Adana-Antalya highway (E-90 highway) via a 4.5 km road,

k) Legal Issues –Akkuyu Project was formally approved by the parliaments of both counties and established the legal framework for the implementation of the Akkuyu NPP project. The Akkuyu Project Agreement also requires that the project be implemented in accordance with all Turkish national laws and regulations, including all license requirements,

l) Nuclear Security –Akkuyu Project Agreement establishes that there shall be joint cooperation specifically for the physical protection of the NPP. Protection of the site is the responsibility of APC. Both the Republic of Turkey and the Russian Federation are signatories of the Convention of the Physical Protection of Nuclear Materials and the Treaty on the Non-Proliferation of Nuclear Weapons.

Considering these investigations, Review and assessment of Site Parameters Report is going on as given below:

- Application control completed,
- Site Group first R&A completed, final review and assessment is going on,
- ACNS made two meeting and final decision was taken,
- Technical Support (final review and assessment is going on),
- AEC was informed for improvements in a meeting,
- IAEA mission was carried out in February 2015.

On the other hand, Construction License Application is expected to be submitted in May 2016.

14.1.4.2 SINOP SITE

Sinop site is located on the Black Sea coast in the province of Sinop. The site is situated approximately 16 km west-northwest of Sinop. An "Owner" application was made by Turkish Electricity Generation Company (EÜAŞ) to TAEK and EÜAŞ was recognised as an owner of Sinop NPP in August 2012.

An Inter-Governmental Agreement (IGA) has been signed between Turkey and Japan on the 3rd May 2013 for the construction of four units of ATMEA1 Reactor (1100 MWe per reactor) with projected commercial operating in 2020's.

A collective work will be performed related to site issues by a project company which will be established after the Host Governmental Agreement (HGA). Until this time a consortium of project sponsor companies will perform site feasibility works.

With the owner Turkish Electricity Generation Company (EÜAŞ); the project sponsors Mitsubishi Heavy Industries, ITOCHU Corporation and ENGIE are the parties of the Sinop Nuclear Power Plant consortium partners.

At this stage of the project, the project sponsors are evaluating the suitability of the site and the viability of the project.

Regulatory review and control activities have been carried out by informative meetings and site inspections during this stage. As mentioned in GSR Part 1-R 25; TAEK reviewed and assessed relevant information submitted by the vendor to determine whether activities comply with regulatory requirements and the conditions specified in the authorization.

Site characterization phase is in progress. Details for determining site properties, in scope of the works about site licensing by EÜAŞ is given below:

A protocol was signed in September 2012 with The Scientific And Technological Research Council Of Turkey -Marmara Research Center (TÜBİTAK-MAM) for evaluating studies both on land and off shore about the fields; geology, oceanography, geophysics, seismology, geotechnical, geodesy.

JAPC (Japanese Atomic Project Company) and Dokuz Eylül University (İzmir/Turkey) performed Offshore Studies in 2013, for Identification and characterization of potential seismogenic features in the near region in order to make an assessment of their contribution to the seismic hazard

JAPC (Japanese Atomic Project Company) have performed Onshore Surveys in 2014 and 2015, for Identification and characterization of potential seismogenic features in the near region in order to make an assessment of their contribution to the seismic hazard at the Sinop NPP site. These surveys contain Boring, Seismic Reflections, PS Logging, Microtremor works.

Within these site studies, it is fundamental to assess seismic hazards. Therefore, a Senior Seismic Hazard Committee (SSHAC) has been established by project sponsor companies so as to evaluate seismicity in accordance with US Guide - NUREG/CR-6372 (Recommendations for Probabilistic Seismic Hazard Analysis: Guidance on Uncertainty and Use of Experts)

Senior Seismic Hazard Committee (SSHAC) approach will allow considering uncertainties related to random and epistemic uncertainties, as recommended by the IAEA guideline SSG-9.

Marine Flora Fauna, Bathymetry, Geomorphology, Lidar and Meteorology are other subjects of under the scope of site studies.

All the site studies given above are under regulatory control by TAEK Inspections. Throughout these inspections TAEK experts and outsourced Consultants from various universities haven taken in charge.

The submission of Site Report and Site Parameters Report is to be expected in 2018.

14.2 IMPACT OF THE INSTALLATION ON INDIVIDUALS, SOCIETY AND ENVIRONMENT

The characteristics of the natural environment, population and individuals in the region that may be affected by potential radiological impacts in operational states and accident conditions through all possible transport pathways are investigated and assessed. Applicability of emergency plans is also evaluated and planning zones are determined accordingly. All these characteristics are monitored throughout the lifetime of the plant. In accordance with requirements and criteria of the authority, an adequate quality assurance programme shall be established and applied to conduct and control the effectiveness of the site investigations and assessments.

"Regulation on Nuclear Power Plant Sites", "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008" and the draft "Regulation on Nuclear Installation Safety" require the effects of the NPP to the site and the applicability of the emergency plans. The feasibility of the implementation of the emergency measures in the emergency planning zone within the projections in the population during lifetime of the plant is demonstrated. Details are given in these regulations.

MoEU defines some requirements to the environmental studies and the radiological and non-radiological impact of the plant. EIA Report consists of assessment of main impacts any nuclear power plant during operation (normal operation, design and beyond design basis accidents) and decommissioning process on aquatic and terrestrial ecosystems, the personal of the plant and the public:

- Thermal impact, related to operation of cooling systems of the plant' equipment (warm water release),
- Chemical impact, due to usage of chemicals in plant process, cleaning and water treatment systems, prevention of biogrowth on the equipment and cooling sea water supply lines, emissions in air of combustion products of fossil fuels, etc.,
- Radiological impact,
- Electromagnetic impact, sources of which could be gridlines, high voltage equipment on the site,
- Noise impact.

14.2.1 AKKUYU NPP SITE

Within the Updated Site Report and Site Parameters Report there is a preliminary assessment of the radiological impact of the plant. The assessment takes into account severe accidents and normal operation releases based on up to date meteorological data to estimate the atmospheric dispersion factors for Akkuyu NPP site. In addition ground surface contamination and public exposure doses have been determined for gaseous releases as well as evaluation of the liquid discharges to the environment. The analyses comply with the relevant Russian standards in the field and have been based on data for the reference plant since the final dispersion factors relevant to the actual design will be provided in the PSAR.

EIA Report consists of assessment of main impacts Akkuyu NPP power plant during operation (normal operation, design and beyond design basis accidents) on aquatic and

terrestrial ecosystems, the personal of the plant and the public.

14.2.2 SINOP NPP SITE

As the Host Governmental Agreement (HGA) has not been signed after Inter Governmental Agreement (IGA) and no site study has been performed on this issue, currently there is no information on the radiological impact of the installation to the environment. It shall be evaluated and included in the relevant licensing applications.

14.3 RE-EVALUATION OF SITE RELATED FACTORS

The draft "Regulation on Nuclear Installation Safety" requires surveillance and re-evaluation to be performed to ensure continued acceptability of site conditions. Since the site license was granted to the Akkuyu site in 1976, necessary information on the site were updated in 2009, including on-site meteorological measurements, environmental monitoring, and flora-fauna survey and studies for seawater hydrology, cooling water discharge and external human induced events. After allocating Akkuyu Site to APC, site investigations started for updating all site characteristics and parameters. The Updated Site Report was submitted to TAEK in March 2012 and approved December 2013 and all of site related factors are re-evaluated and regulatory review and inspections were performed during licensing process.

14.4 CONSULTATION WITH OTHER CONTRACTING PARTIES LIKELY TO BE AFFECTED BY INSTALLATION

Turkey's legislative and regulatory framework ensures that nuclear materials and facilities are utilized and nuclear activities are performed with proper consideration for health- safety, security and protection of the people and the environment. In this respect, Turkey signed and/or approved international agreements and conventions.

Four bilateral agreements for Early Notification of Nuclear Accidents are in force between Turkey and Bulgaria, Romania, Ukraine and Russia. No new agreements or conventions are signed after the Fukushima accident.

After the accident at the Fukushima Dai-ichi NPP, a number of studies have been implemented by European Nuclear Safety Regulators Group (ENSREG) to review and improve the nuclear facilities of the European Union nations. In this context, safety and risk assessment studies have been initiated within the scope of stress tests.

An undertaking has been initiated by the European Commission to allow participation of neighbouring countries to the stress tests. Turkey is among the countries that signed the Joint Declaration on comprehensive risk and safety assessments of nuclear plants, also called stress tests and observes these studies and supports the decisions reached by consensus. As an outcome of the Joint Declaration, Turkey's national nuclear safety regulator TAEK has requested applicable stress test evaluations for the Akkuyu project from the APC. APC developed the applicable stress test evaluations for the Akkuyu project and submitted to TAEK.

15 DESIGN AND CONSTRUCTION (ARTICLE 18)

15.1 IMPLEMENTATION OF DEFENCE IN DEPTH

The "Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" focuses on design issues for ensuring safety of nuclear power plants. Similarly, "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008" addresses construction issues for nuclear power plants.

"Guide on Specific Design Principles", which is issued in 2012 defines specific principles to be applied during the design stage of a nuclear power plant. Among the principles which are defined in the Guide are levels of defence in depth, plant states and objectives, earthquake and aircraft crash.

For the construction of nuclear power plants, safety evaluation of design and achievement of quality during manufacturing and construction are the main principles addressed in the "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008". The Regulation also mentions the use of proven technologies in design.

Another arrangement for use of a proven power plant design is the reference plant approach which is defined in "Directive on Determination of Licensing Basis Regulations, Guides and Standards and Reference Plant for Nuclear Power Plants, 2012".The approach defined in the Directive is in parallel to the IAEA INSAG-26 document on "Licensing of the First Nuclear Power Plant". According to the Directive, "the Owner must propose a nuclear power plant in operation as reference plant that represents the plant, for which the license application has been made. If there is no such plant in operation, a plant of the same technology that has been licensed upon a comprehensive nuclear safety assessment by a competent nuclear regulatory body and is under construction may be proposed".

Novovoronezh-II NPP in Russian Federation is approved as the reference plant for Akkuyu NPP by AEC of TAEK.

15.2 INCORPORATION OF PROVEN TECHNOLOGIES

The TAEK "Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008" and Russian safety rules require that technical and administrative decisions made for ensuring NPP safety shall be well proven by the previous experience or tests, investigations, operating experience of prototypes and shall meet requirements of regulatory documents. Such approach shall be applied not only in development of equipment and design of the NPP but also in manufacture of equipment, construction and operation of the NPP, its back fitting and reconditioning of its systems (elements).

Technologies proven by experience and testing are used in the design of the reference NPP. Where an unproven feature is introduced, safety is demonstrated to be adequate by appropriate supporting research programs and by prototype testing.

Physical and mathematical models used in the design are verified by experiments, operational tests and data analyses. In the safety analysis of the plant, conservative data and models are used. Realistic data and models are used only when their validity and suitability are proven.

15.3 DESIGN FOR RELIABLE, STABLE AND MANAGEABLE OPERATION

The TAEK "Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" and Russian safety rules provide requirements on

the management of technological processes. To ensure reliable, stable and manageable operation, technical design of the reference NPP includes the required measures.

16 OPERATION (ARTICLE 19)

Safety aspects of commissioning and operation of nuclear power plants are handled in “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008”. Commissioning of an NPP requires permit from TAEK as it was stated in the “Decree on Licensing of Nuclear Installations, 1983”. Details of requirements are laid out in the “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008”. According to the “Decree on Licensing of Nuclear Installations, 1983” any changes to operational limits and conditions are subject to approval of TAEK.

The “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008” states that the installation is to be operated according to approved hierarchical procedures which need to be updated regularly. Regulatory requirements for operation, maintenance, inspection and testing of a nuclear installation are also specified in this regulation. The activities are performed in the framework of a program, which is supported by a Quality Management System and subject to approval of TAEK.

On the other hand, principles and rules of conduct for operational procedures, their implementation, periodic review, modification, approval and documentation are stated in the “Regulation on Basic Requirements on Quality Management for the Safety of Nuclear Installations, 2007”.

The “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008” requires the operator to have an engineering and technical support team, competent in all disciplines important for safety, is available throughout the lifetime of the plant.

The continuing safe operation of a nuclear power plant requires the support of an engineering organization, which can be called on as required to assist with plant modifications, repairs and special tests, and to provide analytical support as necessary for the safety of the plant. It is the responsibility of the plant management to ensure that the resources required are available.

Technical support organizations (TSO) will be used when necessary. For Akkuyu Project, UJV Rez (UJV) has been selected as the TSO and an agreement has been signed between TAEK and UJV in 2014. TAEK intends to use an international TSO for will perform review and assessment during licensing of Akkuyu NPP first unit.

Abnormal events, which include incidents significant to safety, are notified to TAEK according to the “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008”. A draft regulation is planned for notification and reporting procedures for NPP.

The “Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008” requires the operator to have a technical team for necessary engineering and technical support during modifications, repairs and special tests to assist itself for safe operation. This regulation also requires the operator to compile and analyse the operational experience and share and make use of the lessons-learned within the framework of a program.

Safe management of radioactive waste has been addressed as a requirement in the “Regulation on Radioactive Waste Management”, putting an emphasis on keeping the radioactivity and volume of waste produced as low as reasonably achievable within the framework of a program. For on-site spent nuclear fuel storage, provisions of "Regulation on Design Principles for Safety of Nuclear Power Plants, 2008" will be applied.

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ANNEX I

Multilateral Conventions, Treaties and Bilateral Agreements of Turkey

1. Paris Convention on Third Party Liability in the Field of Nuclear Energy (July 29th, 1960), 1961
    a. Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of 29 July 1960 (January 28th, 1964), 1967
    b. Protocol to Amend the Convention on Third Party Liability in the Field of Nuclear Energy of July 29th, 1960, as Amended by the Additional Protocol of January 28th, 1964 (November 16th, 1982), 1984
2. Treaty on the Non Proliferation of Nuclear Weapons (NPT), 1979
3. Agreement Between the Government of the Republic of Turkey and the IAEA for the Application of Safeguards in Connection with NPT, 1981
    a. 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, 2001
4. Convention on the Physical Protection of Nuclear Material, 1986
5. Convention on Early Notification of a Nuclear Accident, 1990
6. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, 1990
7. Convention on Nuclear Safety, 1994
8. Comprehensive Test Ban Treaty, 1999
9. Agreement Between the Government of Canada and the Government of the Republic of Turkey for Co-operation in the Peaceful Uses of Nuclear Energy, 1986
10. Agreement Between the Government of the Republic of Turkey and the Government of Argentine Republic for Co-operation in the Peaceful Uses of Nuclear Energy, 1992
11. Agreement Between the Government of the Republic of Turkey and the Government of the Republic of Bulgaria on Early Notification of a Nuclear Accident and on Exchange of Information on Nuclear Facilities, 1997
12. Agreement Between the Government of Korea and the Government of the Republic of Turkey for Co-operation in the Peaceful Uses of Nuclear Energy, 1999
13. Agreement Between the Government of the Republic of Turkey and the Cabinet of Ministers of Ukraine on Early Notification of a Nuclear Accident and Exchange of Information on Nuclear Facilities, 2001
14. Agreement Between the Government of French Republic and the Government of the Republic of Turkey for Co-operation in the Peaceful Uses of Nuclear Energy, 2004
15. Agreement for Cooperation Between the Republic of Turkey and the United States of America Concerning Peaceful Uses of Nuclear Energy, 2006

16. Memorandum of Understanding for Technical Cooperation and Exchange of Information in Nuclear Regulatory Matters Between Turkish Atomic Energy Authority and the State Nuclear Regulatory Committee of Ukraine, 2008
17. Agreement Between the Government of the Republic of Turkey and the Government of Romania on Early Notification of a Nuclear Accident, 2008
18. Agreement Between the Government of the Republic of Turkey and the Government of the Russian Federation for Cooperation in the Use of Nuclear Energy for Peaceful Purposes, 2009
19. Agreement Between the Government of the Republic of Turkey and the Government of the Russian Federation on Early Notification of a Nuclear Accident and Exchange of Information on Nuclear Facilities, 2009
20. Agreement Between the Turkish Atomic Energy Authority (the Republic of Turkey) and the Federal Environmental, Industrial and Nuclear Supervision Service (the Russian Federation) for Cooperation in the Field of Nuclear Licensing and Supervision, 2010
21. Agreement Between the Turkish Atomic Energy Authority and the United States Nuclear Regulatory Commission for the Exchange of Technical Information and Cooperation in Nuclear Safety Matters, 2012

ANNEX II

Laws, Decrees, Regulations and Guides Concerning the Safety of Nuclear Installations

Laws

1. Law on Turkish Atomic Energy Authority, 1982

Decrees

1. Decree on Licensing of Nuclear Installations, 1983
2. Decree on Radiation Safety, 1985

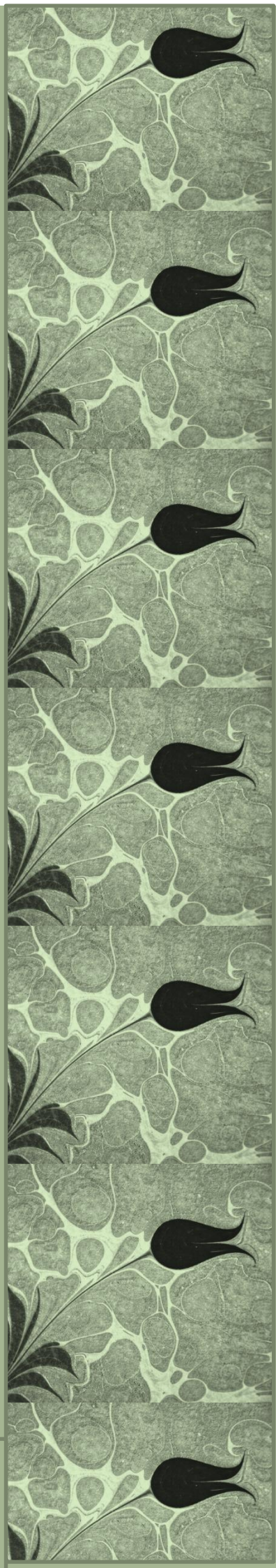
Regulations

1. Regulation on Working Procedures of Atomic Energy Commission, 1983
2. Regulation on Nuclear Definitions, 1991
3. Regulation on the Establishment and Working Procedures of Advisory Committee on Nuclear Safety, 1997
4. Regulation on Radiation Safety, 2000
5. Regulation on Nuclear and Radiological National Emergency Preparedness, 2000
6. Regulation on Safe Transport of Radioactive Material, 2005
7. Regulation on Basic Requirements on Quality Management for the Safety of Nuclear Installations, 2007
8. Regulation on Nuclear Safety Inspections and Enforcement, 2007
9. Regulation on Issuing Document Base to Export Permission for Nuclear and Nuclear Dual Use Items, 2007
10. Regulation on Specific Principles for Safety of Nuclear Power Plants, 2008
11. Regulation on Design Principles for Safety of Nuclear Power Plants, 2008
12. Regulation on Site of a Nuclear Power Plant, 2009
13. Regulation on Protection of Outside Workers in Controlled Areas from the Risks of Ionizing Radiation, 2011
14. Regulation on Physical Protection of Nuclear Materials and Nuclear Facilities, 2012
15. Regulation on Nuclear Material Accounting and Control,2012
16. Regulation on Radioactive Waste Management, 2013
17. Regulation on Clearance in Nuclear Facilities and Release of Site from Regulatory Control, 2013.
18. Regulation Regarding Equipment Procurement Process and Approval of Manufacturers for Nuclear Facilities, 2015

Documents and Guides

1. A Guide on Establishing and Implementing a Quality Assurance Programme for Safety in Nuclear Installations, GK-KYS-01, 2009

2. A Guide on Management of Non-Conformance Control and Corrective Actions for Safety in Nuclear Installations, GK-KYS-02, 2009
3. A Guide on Management of Document Control and Records for Safety in Nuclear Installations, GK-KYS-03, 2009
4. A Guide on Inspection and Testing for Acceptance for Safety in Nuclear Installations, GK-KYS-04, 2009
5. A Guide on Format and Content of Site Report for Nuclear Power Plants, 2009
6. A Guide on Assessment of the Implementation of the Quality Assurance Programme for Safety in Nuclear Installations, GK-KYS-05, 2010
7. A Guide on Quality Assurance in Procurement of Items and Services for Safety in Nuclear Installations, GK-KYS-06, 2010
8. A Guide on Establishing and Implementing a Quality Assurance Programme in Siting for Safety in Nuclear Installations, GK-KYS-09, 2010
9. A Guide on Quality Assurance in Manufacturing for Safety in Nuclear Installations, GK-KYS-07, 2011
10. A Guide on Quality Assurance in Research and Development for Safety in Nuclear Installations, GK-KYS-08, 2011
11. A Guide on Quality Assurance in Design for Safety in Nuclear Installations, GK-KYS-10, 2011
12. A Guide on Quality Assurance in Construction for Safety in Nuclear Installations, GK-KYS-11,2011
13. A Guide on Quality Assurance in Commissioning for Safety in Nuclear Installations, GK-KYS-12, 2011
14. A Guide on Quality Assurance in Operation for Safety in Nuclear Installations, GK-KYS-13, 2011
15. A Guide on Quality Assurance in Decommissioning for Safety in Nuclear Installations, GK-KYS-14,2011
16. A Guide on Specific Design Principles, 2012
17. A Guide on Owner and Authorization Application for Nuclear Installations, 2014
18. Guide on the Construction Activities in Nuclear Installations that are Authorized as per the Authorization Stages, 2016



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