IRAN, ISLAMIC REPUBLIC OF

(UPDATED 2010)

1. ENERGY, ECONOMIC AND ELECTRICITY INFORMATION

1.1. General Overview

The Islamic Republic of Iran is situated in the Middle East and has an area of 1,648,195 square kilometers with a population of more than 71 million, which has doubled over the last three decades (Table 1). It is bordered by Armenia, Azerbaijan and Turkmenistan Republics and Caspian Sea in the north, Afghanistan and Pakistan in the east, Turkey and Iraq in the west and Kuwait, Persian Gulf and Sea of Oman in the south. Mountain chains like Alborz, Zagros make Iran's feature a mountainous country. Vast deserts in the center and south east half of the country makes the major natural geographical profile of it.

1.1.1. Population Information

TABLE 1: POPULATION INFORMATION

	1970	1980	1990	2000	2001	2002	2003	2004
Population (Millions)	28.4	39.3	56.3	63.7	64.5	65.5	67.0	67.5
Population Density (Inhabitants/km²)	17.3	23.8	34.2	38.6	39.1	39.7	40.7	40.9
Urban Population as % of Total								

Source: Iran Statistical Year Books

From north to the south of the country, climate and temperature change abruptly (-20°C, +50°C). Central and Southern Iran is dry and hot with low precipitation. On the whole, it has four distinct seasons. The southern part, nearby Persian Gulf, where Bushehr Nuclear Power Plant is situated has long, hot and humid summers and moderate winters. The country has a fairly high seismic activity.

It is one of the world's main oil producers. The country holds large oil reserves and has many potential reservoirs. Within the territory of the I.R. Iran there are three geographic areas of oil production (north, central, and southwest) and one region of natural gas (southeast) production but geologically most of the country's vast oil and gas reserves are located along the fold and thrust belt of the Zagros Mountains. These mountains rise in southeast Turkey and run along the entire length of west of Iran and terminate in the southeast at the Sea of Oman at a distance of almost 1,800 km from the starting point. The country has also coal and uranium resources.

1.1.2. Economic Indicators

TABLE 2: GROSS DOMESTIC PRODUCT

	1980	1990	2000	2001	2002	2003	2004
GDP (Millions of Current Rials)	-	-	576 493.0	664 620.0	917 035.0	1 095 303.0	1 384 819.0
GDP (Millions of Constant 1997 Rials)	178 149.0	218 539.0	320 069.0	330 565.0	355 554.0	379 838.0	398 234.0
GDP Per Capita (Thousands Current Rials)	-	-	9 050.0	10 304.0	14 000.0	16 350.0	20 522.0

Source: The Central Bank of I.R. Iran, Annual National Accounts

1.2. Energy Information

1.2.1. Energy Situation

On the supply side, more than 99% of primary energy is derived from oil and gas resources (oil and natural gas account for supplying more than about 99% need for primary energy) and only about 1% is from hydro, coal and non-commercial energies. Likewise, in electrical sector, more than 82.6% of the present nominal installed capacity 49,424.4 MW (e) is based on oil and gas fired turbines.

According to the latest statistics issued by Ministry of Power, the proven and exploitable reserves of oil are about 137.62 milliard barrels. Despite of the rapid expansion of the gas sector, in recent years, oil still plays a very important role in energy system as well as economy of the country. Petroleum products constitute more than 43.4% of the primary energy supply and 45.6% of the final energy consumption. The share of oil sector in GDP(constant 1997 Rials) is more than 12.5% and more than 82% of the country's foreign exchange earnings come from export of this commodity.

The proven gas reserves of Iran are estimated to be 29.61 trillion cubic meters in 2007. These reserves theoretically give Iran a lead-time of more than 166 years to exploit them at the existing production level.

The proven reserves of coal in Iran are estimated to be approximately 11-14 milliard tons. But in regard to the existing technologies, only 8.5 percent of these resources are exploitable and at much higher cost than that of the international level. That is why coal plays only a minor role in Iran's energy supply mix and it is not regarded a viable option in foreseeable future.

According to the latest information released by Ministry of Power, the practical hydro potential of the country is projected to be only 28,569.7 MW(e). Up to now around 7,422.5 MW(e) has been exploited and another 5,082.6 MW(e) is in process of execution, about 10,426 MW(e) is under consideration and ready to execute more than 5,638.6 MW(e) is at the stage of preliminary studies and recognition.

Uranium resources of Iran are not studied completely and precisely yet but it had been considered before in as not rich one. The results of the first attempt of Atomic Energy Organization of Iran (AEOI) exploration activities have shown proven reserves of about 3,000 tons of Uranium so far. According to the discovered indices (more than 350 anomalies) and the results of the field discoveries, the expected resources of Iran could be at the range of 20,000-30,000 tons of U3O8, throughout the country. Therefore Iran's domestic reserves might be sufficient enough to supply the raw material for needed nuclear power plants in future.

According to all the surveys performed in power sector of Iran, nuclear option is the most competitive to fossil alternatives if the existing low domestic fuel prices are gradually increased to its opportunity costs at the level of international prices. There are some local potentials of renewable

energies in Iran. The annually average daily solar radiation is about 1,800 kWh per m2.

There are also some potentials of wind and geothermal energies in some parts of the country, which may be considered for handling some locally needs. However, because of the limitation of the existing technologies for steady and reliable supply of energy and much higher unit cost of electricity generated by these resources, it is not expected that renewable play a major role in Iran's electricity system in near future.

In the last two decades, the size of population has been raised about 1.7 times, the final energy consumption more than 6 times and electricity production about 5 folded. These figures show a very high level of consumption and an incremental trend of energy intensity. Historical energy statistics are shown in Table 3.

TABLE 4: ENERGY STATISTICS

*ENERGY CONSUMPTION***	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	Average Annual Growth Rate (%) 2000 - 2007
TOTAL	185.00	359.80	621.90	639.70	691.60	724.60	778.70	842.00	916.90	975.20	6.63
- Petroleum Products	161.90	270.70	362.70	372.60	391.10	395.00	400.90	427.00	444.30	439.70	2.78
- Natural Gas	8.70	55.90	200.60	204.60	234.10	257.00	299.10	322.50	374.30	437.60	11.78
- Coal	0.10	0.12	0.15	0.50	0.40	0.40	1.10	1.20	1.10	1.07	32.40
- Electricity	11.30	29.60	55.60	59.50	64.10	70.40	76.00	79.70	86.40	91.20	7.32
- Others	3.00	3.50	2.60	2.60	2.00	1.80	1.50	25.40	25.40	5.60	11.58

ENERGY PRODUCTION	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2000 - 2007
TOTAL	585.20	1366.10	1817.10	1759.70	1731.50	1973.50	2116.70	2264.10	2312.00	2427.80	4.22
- Crude Oil	541.20	1192.20	1429.40	1358.90	1275.60	1456.90	1534.40	1613.60	1595.40	1629.30	1.88
- Natural Gas	29.30	153.10	372.20	390.50	444.00	502.60	568.50	621.50	686.50	774.30	11.03
- Coal	2.90	4.40	5.60	4.80	5.20	4.98	6.00	7.60	7.50	8.00	5.20
- Renewable Energy	8.80	9.50	2.22	3.02	4.82	30.10	6.23	9.54	10.77	10.68	25.15
- Others	3.00	6.90	2.60	2.60	2.00	46.20	1.50	11.80	11.80	5.60	11.58

NET IMPORT (IMP - EXP)	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2000 - 2007
TOTAL	-324.70	-872.70	-948.00	-832.00	-836.20	-975.90	-1045.20	-1064.20	-988.50	-995.10	0.69
- Crude Oil & Petroleum	-324.80	-861.70	-971.40	-860.90	-864.60	-993.80	-1062.50	-1069.00	-993.40	-999.90	0.40
- Natural Gas	-	-13.10	20.70	26.20	25.30	14.60	14.80	2.80	3.40	3.50	-22.40
- Coal	0.10	2.10	3.10	2.80	3.10	2.90	1.70	2.50	2.00	1.60	-9.01
- Electricity	-	-	-0.40	-0.20	0.10	0.40	0.20	-0.40	-0.10	-0.40	-

Source: Energy Balance 2006, Power Ministry of IRAN

1.2.2. Energy Policy

Iran's government has given priority to hydropower in the first and second 5 years development plans. This policy will continue in future development programs. But due to the limitations of hydro potentials and the rapid growth of electricity demand, other options are also need to be considered for diversification purpose. The other policy of the government is to use different energy potentials for conservation measures at present time. Moreover, some conservation on energy consumption control and management measures have been implemented to control growth of demand in recent years. In supply side, the government has launched a seriously program for substitution of oil by gas as well as more exploitation of hydro power in electricity system of the country. Completion of Bushehr nuclear power project and implementation of a project to install 100 MW(e) from wind turbine is regarded to be a part of this diversification program.

1.3. The Electricity System

1.3.1. Structure of the Electricity Sector

The main producer of electricity in Iran is the Ministry of Power. The electricity system of Iran (production, transmission and distribution) is centralized and owned by the government. Recently, the government has started to study about the privatization in small-scale to assess its benefits and outcomes for future programs.

1.3.2. Decision-making process

The Ministry of Power is responsible for the development of power sector based on the energy programmed, and concepts, which are approved by the Government of the Islamic Republic of Iran in its 5 years development programmed.

1.3.3. Main Indicators

In 2007, the maximum exploitable power was 43,917.4 MW(e) with 34% share of steam power plants, 47.9% share of gas and combined cycle power plants, 16.9% share of hydro power plants, 1.12% share of diesel, Solar & Wind power plants. Table 4 shows the historical electricity production and installed capacity and Table 5 the energy related ratios.

TABLE 5: ELECTRICITY PRODUCTION & INSTALLED CAPACITY

Electricity Production (Million KWh)	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	Average Annual Growth Rate (%) 2000 - 2007
TOTAL	19 881.00	54 896.00	115 708.00	124 276.00	135 145.50	146 962.70	159 988.10	171 173.60	181 685.20	190 032.20	7.34
- Hydro	5 620.00	6 083.00	3 650.00	5 057.00	8 050.00	11 098.50	10 626.60	16 100.20	18 265.60	17 986.90	25.58
- Steam	8 197.00	38 836.00	78 332.00	81 103.00	81 983.00	85 402.90	88 643.80	89 573.60	88 961.70	90 900.10	2.14
- Gas	5 088.00	8 723.00	20 510.00	19 888.00	17 170.60	17 276.20	24 209.40	29 022.80	33 758.00	26 979.70	3.99
- Combined Cycle	-	-	12 855.00	17 899.00	27 586.00	32 894.50	36 249.60	36 194.00	40 342.90	53 796.30	22.60
- Diesel	976.00	1 254.00	361.00	329.00	355.70	290.30	252.00	212.00	231.60	225.80	-6.48
- Solar & Wind	-	-	-	-	0.20	0.30	6.70	71.00	125.40	143.40	-

Nominal Capacity (MWe)	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007	2000 - 2007
TOTAL**	11 658.00	14 803.00	26 814.00	28 559.60	31 067.60	33 945.60	36 926.20	38 213.20	40 896.80	43 917.40	7.30
- Hydro	1 804.00	1 953.00	1 999.00	1 999.00	3 028.00	4 423.70	5 011.70	6 043.92	6 572.20	7 422.30	20.16
- Steam	3 983.00	8 086.00	13 752.00	144 023.00	144 023.00	14 530.40	14 855.40	14 890.40	14 890.40	14 935.00	1.18
- Gas & Combined Cycle	5 088.00	3 940.00	10 530.00	11 625.00	13 147.00	14 495.00	16 541.00	16 738.00	18 957.40	21 068.20	10.41
- Diesel	783.00	824.00	533.00	533.00	490.00	492.60	493.10	493.10	417.90	417.90	-3.41
- Solar & Wind	-	-	-	0.64	0.64	3.93	25.00	47.74	58.86	74.06	-

(1) Electricity losses are not deducted.

Source: Energy Balance 2006, Power Ministry of IRAN

TABLE 6: Energy Related Ratios

	1980	1990	2000	2001	2002	2003	2004	2005	2006	2007
Energy Consumption Per Capita (GJ/Capita)	4.71	6.72	9.68	9.89	10.43	10.76	11.39	12.23	13.21	12.50
Electricity Production Per Capita (kWh/Capita)	569.59	1 084.78	1 890.14	1 993.82	2 127.91	3 285.96	2 442.27	2 566.48	2 733.24	2 601.00
Electricity Production/Energy Production (%)	5.20	6.60	7.70	8.20	8.20	8.50	8.50	8.20	8.40	4.50
Nuclear/Total Electricity (%)	-	-	-	-	-	-	-	-	-	-
Ratio of External Dependency (%)**	-174.50	-231.90	-152.40	-130.10	-120.90	-134.70	-134.30	-124.40	-106.10	-124.20

1. [(1)] Net Import / Total Final Energy Consumption.
2. Source: Energy Balance, Power Ministry of IRAN

2. NUCLEAR POWER SITUATION

2.1. Historical Development and current nuclear power organizational structure

2.1.1. Overview

In the mid 1970s, a major nuclear power program was planned and construction of two nuclear power plants, two 1,294 MW(e) PWR units started at Bushehr. Bushehr Nuclear Power Plant (BNPP) is situated on the northern part of the Persian Gulf, near the city of Bushehr. In 1979 this nuclear power plant construction program, first started with the KWU as the vendor, was suspended and construction activities halted, at a fairly advanced stage of the civil work for the two units.

The Islamic Republic of Iran resumed the nuclear power program in 1991 with a bilateral agreement with China for the supply of two 300 MW(e) PWR units of Chinese design, similar to the Qinshan power plant. The agreement was confirmed in 1993 (but never realized).

In 1992, the governments of the Islamic Republic of Iran and of the Russian Federation signed a bilateral agreement on the peaceful uses of atomic energy. As a follow-up, the Atomic Energy Organization of Iran (AEOI) and the Ministry of Atomic Energy (MINATOM) of the Russian Federation reached an agreement for the completion of the Bushehr NPP Unit 1 with a WWER-1000 type reactor. The decision to resume the Bushehr project with a new design has placed a heavy responsibility on the Atomic Energy Organization of Iran (AEOI), Responsible for the national program of nuclear power and nuclear applications in particular on its Nuclear Power Plant Department (NPPD), which serves as the owner organization, and the National Regulatory Authority of Iran (INRA). In 1998, the AEOI and MINATOM agreed to change the supply agreement for the BNPP Unit 1 to a turnkey contract.

The ongoing and planned developmental activities of the NPPD in compliance with the country's Fourth FYP(Five-Year Plan) are:

1) Development of 5000 MWe Nuclear power of Pressurized Light Water Reactor(PWR) type is considered to be done through cooperation with international companies.
2) Required manpower should be supplied and trained.
3) It is foreseen for the executive actions to produce 2000 MWe of the above-mentioned 5000 MWe to be started in 2010.
4) Completion of construction, installation and putting in operation of the BNPP Unit 1 in 2010.
5) Contract modeling and provision of measures for maximizing the participation/contribution of indigenous industries, contractors

and human resources and also usage of locally available materials.

6) Preparation of the bids specification and evaluation of the bids.

7) Assessment of NPP projects implementation, human resources development and maintenance.

8) Establishment of technical support infrastructure and radioactive waste management.

Furthermore, the Atomic Energy Organization of Iran has decided to undertake the development of the conceptual, basic and detail and eventually construction of a medium size Pressurized Light Water reactor with an electric output of about 360 MWe (IR-360). The feasibility studies and eventual conceptual design and basic design will be finished within the 1st quarter of 2010.

It is expected that the IAEA would provide technical support in terms of reviewing and commenting on the various aspects of the IR-360 engineering design. It is also expected that technical support would be provided in establishing a strong R&D program in support of the reactor design and its verification.

2.1.2. Nuclear Power Plants: Status and Operations

Completion of Bushehr Nuclear Power Plant is the only on-going nuclear power plant project in Iran, which will provide 1000 MW(e) to the national electrical grid. Currently, Iran has no under exploitation NPP. Work on the completion of the 1000 MWe Bushehr Nuclear Power Plant, Unit (BNPP-1), is at an advance stage. Figures for the FYP (Four Year Plan) envisage the addition of 1000 MWe to the power generation capacity through the completion of BNPP-1. Hence, in order to prevent power shortage, fulfilling the eco-technical development programs, the country has aimed to start executive actions to produce 2000 Mwe out of 5000 Mwe to be started in 2010.

TABLE 8: PLANNED NUCLEAR POWER PLANTS

Station/Project Name	*Type*	*Capacity [MWe]*	*Operator*	*Status*	*Reactor Supplier*	*Construction Date*	*Planned Criticality Date*	*Planned Grid Date*	*Pla Com*
BUSHEHR-1	VVER	915	NPPD	Under Construction	ASE	01-May-75	14-05-2010	08-06-2010	02-

Source: IAEA Power Reactor Information System as of 31 December 2009.

2.1.3. Nuclear fuel production

Iran has a wide range program for providing nuclear fuel for its ongoing power plant and programmed power plants in future. Nuclear fuel cycle of Iran includes uranium exploration, mining, U3O8 production, uranium conversion, uranium enrichment and fuel fabrication, which have been started from several years ago, and have been achieved different physical progresses in these years. It is expected to develop the activities especially

in the field of exploration, mining, U3O8 production and fuel fabrication to ensure the ability of producing nuclear fuel that is needed for developing programs of the nuclear power plants. In addition to respond the requirements of the radioactive waste management a great project is defined its site is selected and it is in the stage of designing. The international practice is envisaged for supply of such services. Relevant measures for storage of wastes are to be considered in the unit design.

2.1.4. Research and Development

The AEOI is the main organization in Iran for research and development activities in the field of nuclear technology. The Nuclear Science and Technology Research Institute (NSTRI) dependant to AEOI is responsible for planning and performing the research projects as well as transferring and developing the peaceful nuclear technologies within the country. The approved projects are implemented by the affiliated Research Schools independently. Major Objectives of Nuclear Science and Technology Research Institute (NSTRI) are as follows:

1) Promotion and Development of research in the field of Nuclear Science and Technology
2) Laying the groundwork for the promotion of the related research activities.

The affiliated Research Schools belongs to Nuclear Science and Technology Research Institute (NSTRI) are as follows :

- Nuclear fuel cycle Research School
- Nuclear Science Research School
- Material Research School
- Radiation Applications Research School
- Plasma Physics and Nuclear Fusion Research School
- Laser and Optics Research School
- Reactors and Accelerators Research and Development School
- Agricultural, Medical and Industrial Research School

2.1.5. International Co-operation and Initiatives

Iran has been participating in conferences, technical committee meetings, general meetings, advisory group meetings, training and fellowship programs under the sponsorship of the IAEA or in the frame-work of its Technical Co-operation projects.

The International Atomic Energy Agency enhances the peaceful applications of nuclear science and technology in Iran by means of the following Technical Co-operation projects; for 2009-2011 cycle:

1) Regulatory Infrastructure for Licensing and Control of Nuclear and Radiation Facilities in Iran (IRA2007019)

2) Strengthening Technical Capabilities for Management of NORM and Te-NORM Waste(IRA2007011)

3) Strengthening Owner's capability for Construction, Commissioning and Licensing Activities of Low and Intermediate Level Waste Disposal Facility (IRA2007006)

4) Environmental radiological monitoring in Esfahan UCF site surrounding in normal and emergency situation and characterizing the pathways of exposure to individuals and the public (IRA2007016)

5) Production of wound dressing hydrogel using electron beam irradiation (IRA2007012)

6) Upgrading of a gamma irradiation facility in Iran (IRA2007013)

7) Strengthening Owner's Capabilities For Commissioning And Start-Up Of Bushehr Nuclear Power Plant (Extension of TC Project IRA/4/035) (IRA2007018)

8) Application of therapeutic radiopharmaceuticals in the nuclear medicine centers and development of QA/Qc and QMS in therapeutic radiopharmaceutical applications (IRA 2007007)

9) Design and Construction of a Clinical PET Cyclotron (Baby Cyclotron) (IRA2007010)

10) Upgrading and Strengthening Human Resources (IRA2007004)

11) Development, preparation and evaluation of new radiopharmaceuticals for cancer diagnosis (IRA2007008)

12) Development of Radiopharmaceuticals for Diagnosis and Therapy of Cancer and Manufacture of Radioactive Sources for Brachytherapy(IRA2007005)

13) Isotope Composition Of Precipitation In North Part Of Iran(IRA2007009)

14) Decommissioning of the Tehran research reactor (IRA2007015)

15) Technical Assistance For The Establishment Of Nuclear Technology Center As An Engineering-Scientific Support For Medical, Agricultural And Industrial Purposes (IRA2007014)

16) Upgrading Owner's Safety And Engineering Infrastructure For Planning And Construction Of Two NPP Unit Pressurized Light Water Reactors (PWR) In Bushehr(IRA2007017)

17) Supporting the development of Radiopharmaceuticals for Diagnosis and Therapy of Cancer and the management of Radioactive Sources for Brachytherapy (IRA/2/009)

18) Supporting the Application of therapeutic Radiopharmaceuticals in the Nuclear Medicine Centers and the development of QA/QC and QMS in therapeutic Radiopharmaceuticals applications (IRA/2/010)

19) Upgrading NPPD's Safety and engineering infrastructure for planning and construction of two NPP units with pressurized light water reactors (PWR) in Bushehr (IRA/4/038)

20) Strengthening owner's capability for construction, commissioning and licensing activities of low and intermediate level waste disposal facility (IRA/9/019)

21) Providing Legislative Assistance (RAS/0/056)

22) Enhancing Human and Nuclear Technology Capacities (RAS/0/059)

23) Planning and Developing Nuclear Power (RAS/4/031)

24) Improving Integrated Management Systems for Nuclear Power Plants(RAS/4/032)

25) Developing Integrated Control of the Olive Fruitfly (RAS/5/051)

26) Sharing Regional Knowledge on the Sterile Insect Technique within Integrated Area-Wide Fruit Fly pest Management Programmes (RAS/5/052)

27) Contributing to the Assessment of old World Screwworm Files in the Middle East (RAS/5/054)

28) Developing a Regional Screening Network for Neonatal Hypothyroidism (phase II) (RAS/6/056)

29) Strengthening Occupational Radiation Protection (RAS/9/053)

30) Strengthening National Regulatory Infrastructures (RAS/9/054)

31) Strengthening Capabilities for Protection of the Public and the Environment from Radiation Practices (RAS/9/056)

32) Supporting Education and training in Radiation Protection (RAS/9/058)

33) Developing Human Resources in Nuclear security (RAS/9/060)

34) Support for Human Capacity Building in Developing Member States (INT/0/083)

35) Providing Training for Member States in Nuclear Communications (INT/0/084)

36) Promoting Technology Development and Application of Future Nuclear Energy Systems in Developing Countries (INT/4/142)

37) Responding to the Transboundary Threat of Wheat Black Stem Rust(Ug99) (INT/5/150)

38) Strengthening Medical Physic in Radiation Medicine(INT/6/054)

39) Providing Coordinated Support in the Use of Receptor Binding Assay to Address Impacts of Harmful Algal Toxins in seafood(INT/7/017)

40) Supporting Capacity Building in Marine Environmental Protection (INT/7/018)

The Technical Co-operation projects; for 2009-2011 cycle is going to be finalized.

3. Regulatory framework

The legislative and statutory for regulating nuclear facilities and activities in Iran is provided primarily the Atomic Energy Organization of Iran (AEOI) Act (1974) and Radiation Protection (RP) ACT (1989). These Acts and corresponding lower tier legislations decrees are the existing legislations in force that cover whole area shall be regulated in Iran. Legislations are promulgated to provide for the effective control of nuclear, radiation, waste and transport safety. Establishing and maintaining safety is the main purpose for establishing and adequate framework for surveillance and control of all activities associated with nuclear facilities.

3.1. Atomic Energy Act of Iran

The Atomic Energy Organization of Iran Act was promulgated in 1974. The Act covers the activities for which the Atomic Energy Organization of Iran was established. These activities include using nuclear energy and radiation in industry, agriculture and service industries, setting up nuclear power stations and related fuel cycle and desalination factories, establishing the scientific and technical infrastructure require for carrying out the said projects, as well as coordinating and supervising all matters pertaining to nuclear energy in the country.

3.2. Radiation Protection Act of Iran

In view of ever increasing development of radiation applications in different areas and the necessity of protection of workers, public, future generations and environment against harmful effects of radiation, the Radiation Protection Act of Iran was ratified in 1989 by the parliament.

Provisions of RP Act govern all the affairs related to radiation protection in the country including the following:

1) Radiation sources.

2) Working with radiation

3) Construction, establishment, commissioning, operation, decommissioning

4) Any activity connected with radiation sources including import and export, customs clearance, distribution, procurement,

production, manufacturing, possession, acquirement, exploration, mining, transportation, transactions, contracting, transfer, application and/or waste management

5) Protection of workers, public, future generations and the environment against the harmful effects of radiation

3.3. Regulatory Authority

AEOI is defined as the competent authority (regulatory body) by both the AEOI and RP Acts. AEOI delegates its regulatory functions to Iran Nuclear Regulatory Authority (INRA). INRA is established as part of AEOI. INRA has been entrusted by AEOI to issue regulations and guides, authorizations and other regulatory functions in order to regulate nuclear and radiation safety for siting, design, equipment manufacturing, construction, commissioning, operation and decommissioning of nuclear and radiation facilities. INRA is also regulates nuclear safeguards and security. INRA assigns the prime responsibility for safety to the operating organization. The primary objective of INRA is to ensure that the operating organization fulfils its responsibility to protect workers, public, next generations and the environment against harmful effects of ionizing radiation. INRA comprises four department, undertaking regulatory functions namely:

- National Nuclear Safety Department (NNSD)
- National Radiation Protection Department (NRPD)
- National Nuclear Safeguards Department (NNSG)
- Nuclear & Radiation Service Department (NRSD)

3.4. National Nuclear Safety Department (NNSD)

In Iran safety is supervised by NNSD to fulfill the task of regulations of nuclear facilities and activities entrusted to INRA. To achieve this objective, NNSD develops policies, safety principles and associated criteria, regulations and regulatory guides upon as a basis for its regulatory actions, in order to ensure that the facilities are designed in accordance with the latest state of art and technology and there is an adequate assurance that the erection and operation of the facility will be accomplished without undue risk to the health and safety of the general public and personnel.

Regarding the completion of the Bushehr Nuclear Power Plant (BNPP-1) a licensing procedure has been developed by NNSD. In this licensing procedure, specific regulatory process is provided for granting licenses and permit for activities related to reconstruction, commissioning, and operation and decommissioning of BNPP-1. In preparing this procedure, due account has been given for INRA requirements, internationally accepted recommendations such as those issued by the IAEA, and the safety standards prevalent in the Russian Federation. In addition, specific features of the design and operating characteristics, unusual or novel design measures, and principal safety considerations of the BNPP-1 have been considered. Operating Organization is obligated to conduct a safety analysis

in conformance with the regulations and present its results as SAR to NNSD prior to authorization.

It is mandatory for all organizations involved in safety concerned activities in BNPP-1 completion to comply with the relevant provisions of requirements licensing procedure. The fulfillment of compliance with INRA's requirements in the submitted documents is supervised by NNSD. VO "safety" which is an affiliated company to Russian Federation regulatory body cooperates with NNSD through contractual agreement in licensing and supervisory activities concerning BNPP-1.

4. CURRENT ISSUES AND DEVELOPMENTS ON NUCLEAR POWER

4.1. Energy Policy

The competent authorities of the Islamic Republic of Iran have assigned a high priority to the establishment of certain nuclear power generation capacity within the electric energy generation mix of the country as reflected in the Country Program Framework (CPF). Furthermore, based on the law recently (Mid 2005) ratified by the Parliament, the share of nuclear energy in the total electricity generation capacity of the country has been set to 20000 MW in the next decades. The Government provides the required financial and organizational support and technical staff for this National Nuclear Power Program and has recently established Nuclear Power Production and Development Co. of Iran (NPPD), totally state owned, as the owner / operating organization.

- Completion of construction, installation and putting in operation of the BNPP Unit 1
- There is a task given by the government to develop a strategic plan for development of nuclear generation capacities. A feasibility study indicating different alternative options has been performed for the next NPP unit and is provided to the relevant authorities for final decision.
- Technical and economic evaluation and comparison of several alternatives for the construction of a second NPP with the capacity of 1000 MWe.
- Preparation of tender documents has been started in 2005 and will be ready for an internationally distributed bid invitation.
- Feasibility and Site selection studies for the construction of new nuclear power plants in order to meet that target.
- Review the comparative analysis of available options for construction of new NPP projects.
- Contract modeling and provision of measures for maximizing the participation/contribution of indigenous industries, contractors

and human recourses and also usage of locally available materials.

- Preparation of the bids specification and evaluation of the bids.
- Assessment of NPP projects implementation, human resources development and maintenance.
- Establishment of technical support infrastructure and radioactive waste management.

4.2. Privatization and deregulation

At the present time, there is privatization in the field of electricity but in nuclear sector yet not decided. The Government of the Islamic Republic of Iran is considering new plans and programs in this respect. In the beginning and as a starting point, the programs will be launched in other industries to assess the results, advantages and disadvantages in the whole economy system of the country. By means of these achievements, the idea of privatization might be expanded to other branches such as electricity and nuclear sector.

APPENDIX 1

Supplementary Agreement Concerning The Provision of Technical Assistance By The International Atomic Energy Agency To The Government of The Islamic Republic of Iran

The International Atomic Energy Agency (hereinafter referd to as the "Agency") and The GOVERNMENT OF THE ISLAMIC REPUBLIC OF IRAN (hereinafter called the "Government") hereby enter into this agreement concerning the provision of technical assistance to the government by or through the Agency.

ARTICLE I

STANDARDS BASIC ASSISTANCE AGREEMENT

The Government and the Agency shall apply to the technical assistance provided to the government by or through the Agency the provisions of the United Nations Development Programme Standard Basic Assistance Agreement, acopy of which is set out in ANNEX A to this agreement.

ARTICLE II

SAFETY STANDARDS AND MEASURES

The government shall copy to the operations making use of the technical assistance provided to it pursuant to this agreement the Agency's safety standards and measures defined in document INFCIRC/18/REV.1 and the applicable safety standards as they are established in accordance with that document and as they may be revised from time to time.

ARTICLE III

PEACEFUL USE UNDERTAKING AND SAFEGUARDS

1- The government undertakes that the technical assistance it receives pursuant to this agreement shall be used only for peaceful applications of atomic energy and, in particular, that such assistance shall not be used for the manufacture of nuclear weapons, for the furtherance of any military purpose and for uses which could contribute to the proliferation of nuclear weapons, such as research on, development, testing or manufacture of a nuclear explosive device.

2- To this end and to the extent required by the board of governors of the Agency, the Agency's safeguards rights and responsibilities provided for in paragraph A article XII of its statute shall be implemented and maintained with respect to a project subject to this agreement pursuant to an applicable safeguards agreement which is in force between the government and the Agency or, in the absence of such an agreement, pursuant to a safeguards agreement to be concluded between the Government and the Agency prior to the implementation of the assistance approved for the project.

ARTICLE IV

PHYSICAL PROTECTION

To the extent relevant, the Government shall take all the measures necessary for the physical protection of nuclear facilities, equipment and materials relating directly to the technical assistance provided by or through the Agency. The Government shall be guided by the recommendations of the Agency set forth in document INFCIRC/225/Rev.1 and as they may be revised from time to time.

ARTICLE V

Title to Equipment or Materials

Unless otherwise agreed by the parties to this agreement, title to the equipment and materials provided to the Government by or through the Agency in relation to a project subject to this agreement shall vest in the Government upon receipt of the notification by the Agency that the implementation of the technical assistance relating to the project is completed. The Government shall thereupon assume full and exclusive responsibility and all liabilities for the handling, use, maintenance, storage and disposal of such equipment and materials. Upon such transfer of title to the equipment or materials, the Government undertakes that:

1- It shall ensure the proper operation and adequate maintenance of the equipment

2- The equipment shall be made available for use by any expert provided by or through the Agency as may be required for the discharge of his professional duties and

3- To the extent relevant, the use of the equipment and materials shall be subject to the provisions of article III of this agreement

ARTICLE VI

Settlement of Disputes

Any dispute concerning the interpretation or application of this agreement which cannot be settled by negotiation or another agreed mode of settlement shall be submitted to arbitration at the request of either party to this agreement. Each party shall appoint one arbitrator, and the two arbitrators so appointed shall elect a third, who shall be the chairman. If within thirty days of the request for arbitration either party has not appointed an arbitrator or within fifteen days of the appointment of the second arbitrator the third arbitrator has not been elected, either party may request the secretary general of the united nations to appoint an arbitrator. A majority of the members of the arbitral tribunal shall constitute a quorum , and all decisions shall be made by majority vote. The arbitral procedure shall be established by the arbitrators and the expenses of the arbitration shall be borne by the parties as assesses by the arbitrators. The arbitral award shall contain a statement of the reasons on which it is based and shall be accepted by the parties as the final adjudication of the dispute.

ARTICLE VII

Entry into Force

This agreement shall enter into force upon signature by the authorized representative of the Government and by or for the director general of the Agency

REFERENCES

Appendix 1

INTERNATIONAL (MULTILATERAL AND BILATERAL) AGREEMENTS

Multilateral Agreements

Status	In Force	Title	
acceptance: 1974-05-21	1974-05-21	Agreement on the Privileges and Immunities of the IAEA	P&I
Non-Party		Vienna Convention on Civil Liability for Nuclear Damage	VC
Non-Party		Optional Protocol Concerning the Compulsory Settlement of Disputes	VC/OP
Non-Party		Convention on the Physical Protection of Nuclear Material	CPPNM
Non-Party		Amendment to the Convention on the Physical Protection of Nuclear Material	CPPNME
Signature: 1986-09-26 ratification: 2000-10-09	2000-11-09	Convention on Early Notification of a Nuclear Accident	NOT
Signature: 1986-09-26 ratification: 2000-10-09	2000-11-09	Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency	ASSIST
Non-Party		Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention	JP
Non-Party		Convention on Nuclear Safety	NS
Non-Party		Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management	RADW
Non-Party		Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage	PVC
Non-Party		Convention on Supplementary Compensation for Nuclear Damage	SUPP
Signature: 1990-02-12	1990-02-12	Revised Supplementary Agreement Concerning the Provision of Technical Assistance by the IAEA (RSA)	RSA
Non-Party		Third Agreement to Extend the 1987 Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and	RCA

	Technology (RCA)	
Non-Party	African Regional Co-operative Agreement for Research, Development and Training Related to Nuclear Science and Technology (AFRA) - Third Extension	AFRA
Non-Party	Co-operation Agreement for the Promotion of Nuclear Science and Technology in Latin America and the Caribbean (ARCAL)	ARCAL
Non-Party	Co-operative Agreement for Arab States in Asia for Research, Development and Training Related to Nuclear Science and Technology (ARASIA)	ARASIA

Safeguards Agreements

Status	In Force	Title	Reg.No
Signature: 1973-06-05-15	1974-	Application of safeguards in connection with the Treaty on Non-Proliferation of Nuclear Weapons	1080

Report Coordinator – Contact:

Kojouri, N.M. Dr.

Director General

Planning and Techno-Economic studies bureau

Atomic Energy Organization of Iran (AEOI)

End of North Karegar Ave.

P.O. Box: 14155-1339

I.R. of Iran- Tehran

Tel/Fax: 0098-21-88221118

E-Mail: plng@aeoi.org.ir