RUSSIAN FEDERATION

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1. GENERAL INFORMATION

1.1. General Overview

Russia is a large country occupying the eastern part of Europe and the northern part of Asia. In the north the country is bounded by the Arctic Ocean, Finland being the farthest northwest neighbour. In the west and southwest, the country is surrounded by the new independent states, the former republics of the Soviet Union. In the south and southeast, Russia has a common border with Kazakhstan, Mongolia, China and North Korea. The eastern border of the country is the Pacific Ocean; here Japan and the Alaska state of the USA are the nearest neighbours.

The total area of Russia is about 17,075 thousand km^2. The country consists of a large number of administrative units: regions (provinces) and republics. The regions of the country differ widely in territory, natural conditions, the structure and national composition of the population, and economic development. The climate of country is marked by very wide regional variations. A significant part of northeastern Russia falls within the frigid zone, while the Black Sea region has semitropical conditions.

Russia is abundant in energy resources of various kinds. The energy sector is a well-developed and important part of the national economy, producing about 10% of national Gross Domestic Product (GDP). Totally up to 95% of the country's energy consumption is met by fossil fuel. Despite its rich oil, gas and coal potential Russia was one of the first countries to master nuclear energy for peaceful uses. In 1954, the Obninsk Nuclear Power Plant was commissioned and connected to the grid.

According to the latest statistics, the population of Russia amounts to about 146 million (Tables 1 and 2). The average population density is about 8.5 inhabitants per km^2. This number greatly varies around the country: from more than 100 inhabitants per km^2 for some regions in the European part of Russia through less than one for large territories in Siberia and the far northeast.

TABLE 1. POPULATION DISTRIBUTION

Year	Population (millions)					Population Density
	TOTAL	Urban	Rural	Men	Women	(inhab/km^2)
1985	143.8	104.1	39.7	66.1	77.7	8.42
1986	145.1	105.7	39.4	67.7	77.4	8.50
1987	146.3	107.1	39.2	68.4	77.9	8.57
1988	147.4	108.4	39.0	69.0	78.4	8.63
1989	147.4	108.4	39.0	69.3	78.1	8.63
1990	148.0	109.2	38.8	69.6	78.4	8.67
1991	148.5	109.8	38.7	69.8	78.7	8.70
1992	148.7	109.7	39.0	69.9	78.8	8.71
1993	148.7	108.9	39.8	69.9	78.8	8.71
1994	148.4	108.5	39.9	69.8	78.7	8.69
1995	148.3	108.3	40.0	69.7	78.6	8.69
1996	148.0	108.1	39.9	69.6	78.4	8.67
1997	147.5	107.8	39.7	69.3	78.2	8.64
1998	147.1	107.5	39.6	69.1	78.0	8.62
1999	146.7	107.3	39.4	68.9	77.8	8.59
2000	145.9	106.5	39.4	68.6	77.3	8.54

Source: Russian Annual Statistical Transactions, Moscow (2000)

TABLE 2. POPULATION INFORMATION

	1990	1996	1997	1998	1999	2000	Growth rate (%) 1990 to 2000
Population (millions)	148.0	148.0	147.5	147.1	146.7	145.9	-0.1
Population density (inhabitants/km²)	8.7	8.7	8.6	8.6	8.6	8.5	-0.2
Urban population as percent of total	74	73	73	73	73	73	-0.1
Area (1000 km²) 16,995.8							

Source: IAEA Energy and Economic Database; Country Information.

1.2. Economic Indicators

The historical data presented in Table 3 clearly reflect the economic crisis accompanying the process of economic transition reforms. The Gross Domestic Product (GDP) values have been declining since 1990. Lately, there has been some improvement in the macro-economic parameters, but it is still too early to assert that the recovery from the crisis has begun. Figure 1 shows the GDP structure in 1999.

TABLE 3. GROSS DOMESTIC PRODUCT (GDP)

	1980	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	Growth rate (%) 1980 to 1999
GDP[(1)]	540.2	644.2	26.6	81.1	178.3	268.3	335.2	415.9	427.3	266.4	184.3	-5.2
GDP[(2)]	817.5	644.2	25.7	76.4	164.0	241.8	295.6	359.8	362.6	223.3	152.2	-7.2
GDP[(3)] per capita	3,860	4,353	0,179	0,546	1,199	1,808	2,260	2,810	2,897	1,811	1,256	-5.4
GDP by sector (%):												
-Agriculture	N/A	15	14	7	8	6	7	7	6	5	6	
-Industry	N/A	35	38	35	32	31	27	27	26	27	29	
-Transport	N/A	8	7	7	7	8	10	10	9	9	8	
-Construction	N/A	9	9	6	7	9	8	8	7	7	5	

(1) Billions of current US$.
(2) Billions of constant 1990 US$.
(3) Current US$ per capita.
Source: Russian Annual Statistical Transactions, Moscow (2000).

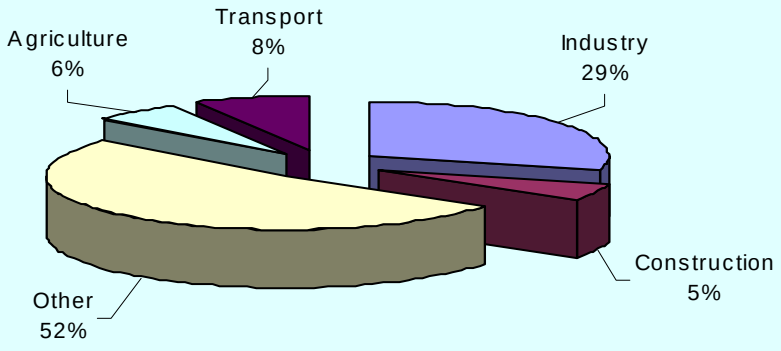

FIG. 1. Gross Domestic Product (GDP) structure in 1999.

1.3. Energy Situation

Energy reserves are shown in Table 4. Fossil fuels form the basis for the Russian energy sector. Table 5 gives the 1999 consumption of the primary energy resources in million tonnes oil equivalent and Table 6 the historical energy data. The share of nuclear energy in the energy supply is only 2%. Hydro energy, which currently is the only meaningful renewable energy resource in Russia amounts to about 3%.

TABLE 4. ESTIMATED ENERGY RESERVES

Exajoule

	Solid	Liquid	Gas	Uranium (1)	Hydro (2)	Total
Total amount in place	4412.3	279.5	1619.4	79.2	231.4	6621.8

(1) This total represents essentially recoverable reserves.

(2) For comparison purposes a rough attempt is made to convert hydro capacity to energy by multiplying the gross theoretical annual capability (World Energy Council - 1998) by a factor of 10.

Source: IAEA Energy and Economic Data Base; Country Information.

1.4. Energy Policy

"The Energy Strategy of Russia" states priorities as well as means for the radical revision of structural and technological policies that pertain to the nation's energy supply for the period 1995-2010. Its main goal is to achieve the European level of per capita energy consumption and ecological safety of population. Emphasis is placed upon the complex approach towards the solution of regional energy supply problems.

TABLE 5. CONSUMPTION OF PRIMARY ENERGY RESOURCES IN 1999

Energy Source	mln toe
Coal	115
Liquid Fuel	211
Natural Gas	516
Nuclear	28
Hydro	33
Other	12

Source: Country Information.

The prognosis of energy sector development in the near future is based on:

- overcoming the national economic crisis and subsequent rise;
- new investment strategy;
- new price and taxation policies;
- privatisation and denationalisation;
- modernisation of national laws and regulation in energy sector.

The structural policy of the energy sector for the next 10-15 years aims:

- enhancement of the efficiency of natural gas utilization and an increase its share of domestic consumption, especially in ecologically strained regions;
- in-depth processing and comprehensive utilization of hydrocarbon raw materials;
- enhancement of the coal quality, as well as the stabilization of coal production volumes;
- reversal of the decline in, and moderate expansion of, oil production;
- intensification of local and renewable energy resources development (hydro and wind power, peat, etc.);
- priority in electricity generation development based on competitive and ecologically clean power plants;

- safety and reliability enhancement of the first generations' NPPs and development of new advanced nuclear power plants.

The new technological energy policy is oriented toward:

- radical enhancement of both the cost effectiveness and the energy efficiency of all stages of the extraction, conversion, distribution, and utilization of energy resources;
- effective decentralization of the energy supply;
- ecological and accident safety, as well as the reliability of the energy supply, and;
- development of qualitatively new technologies for the stable evolution of power industry: ecologically clean coal-fired power plants, safe nuclear power plants, efficient processes for the utilization of new sources of power, etc.

TABLE 6. ENERGY STATISTICS

Exajoule

	1992	1993	1994	1995	1996	1997	1998	1999	2000	Av. annual growth rate (%) 1992 to 1996
Energy consumption										
- Total [1]	34.4	32.31	28.28	30.43	28.48	26.80	25.98	26.31	26.81	-4.6
- Solids [2]	7.7	7.17	6.26	6.00	5.67	4.81	4.27	4.77	5.15	-7.4
- Liquids	9.5	8.71	6.53	6.22	5.47	5.39	5.15	5.25	5.14	-12.9
- Gases	14.5	13.77	13.04	15.74	14.89	14.29	14.26	14.19	14.76	0.7
- Primary electricity [3]	2.7	2.66	2.45	2.48	2.45	2.30	2.28	2.10	1.76	-2.4
Energy production										
- Total	48.2	44.83	41.93	44.16	43.25	41.28	41.38	41.83	42.80	-2.7
- Solids	7.8	7.00	6.18	6.02	5.85	4.82	4.30	4.65	4.81	-6.9
- Liquids	16.7	14.72	13.22	12.77	12.61	12.72	12.61	12.65	13.42	-6.8
- Gases	20.9	20.28	19.89	22.70	22.15	21.24	21.99	21.96	21.97	1.5
- Primary electricity [3]	2.8	2.84	2.65	2.67	2.64	2.49	2.45	2.57	2.61	-1.5
Net import (import - export)										
- Total	-13.5	12.16	-12.75	N/A	-14.57	-14.82	-15.11	-15.52	-15.98	1.9
- Solids	N/A	0.03	0.06	N/A	-0.17	-0.10	-0.08	-0.12	-0.12	-
- Liquids	-7.3	6.54	-6.60	N/A	-7.14	-7.33	-7.49	-7.71	-8.02	-0.6
- Gases	-6.2	5.65	-6.21	N/A	-7.26	-7.37	-7.53	-7.68	-7.84	4.0

[1] Energy consumption = Primary energy consumption + Net import (Import - Export) of secondary energy.
[2] Solid fuels include coal, lignite and commercial wood.
[3] Primary electricity = Hydro + Geothermal + Nuclear + Wind.
Source: IAEA Energy and Economic Database; Country Information.

Regional energy policy takes into account the existing principal differences of energy supply conditions and structures of fuel resources of various parts of Russia. Regional energy self-governing and self-consistency is envisaged as a major challenge, i.e., sustaining the unified national energy sector through the development of federal energy systems: electricity, gas and oil supply networks.

2. ELECTRICITY SECTOR

2.1. Structure of the Electricity Sector

The National Electricity Supply System consists of the Unified Electricity System (UES), the Regional Electricity System "VOSTOK" and the Isolated Local Electricity Systems.

- **Unified Energy System**

The UNIFIED ENERGY SYSTEM of RUSSIA (UESR) is a unique system, which creates significant economic benefits for both the Russian people and Russia's industry. The technical basis of UES of Russia is comprised of:

- 440 electric power stations with a total installed capacity of over 197 thousand MW, including 21 thousand MW at nuclear power stations, which produce 862 billion kW·h of power a year;
- a total of 3,018 thousand km of electric power lines;
- a supply regulation system that unites physically all power installations with a single 50 Hz current frequency.

The organisational basis of UES of Russia is comprised of:

- RAO UESR, which acts as a central locus that implements the functioning and development criteria established by the government based on effectiveness and provides operational supply management aimed at increasing economic efficiency at UESR;
- 74 power suppliers that supply electric and heat power to consumers throughout the Russian Federation;
- 34 large electric power stations that operate independently on the federal (national) wholesale electric power market;
- Over 300 organisations providing technological back up and development for UES of Russia, and which ensure the viability of the industry as a whole.

Large regional UES systems are:

- Central Power Pool (~29.8 % of total capacity);
- Middle Volga Power Pool (~10.3 % of total capacity);
- Ural Power Pool (~ 16.5 % of total capacity);
- Northwest Power Pool (~ 4.4 % of total capacity);
- North Caucasus Power Pool (~ 5.5 % of total capacity);
- Siberia Power Pool (~29 % of total capacity).

- **Regional Electricity System "VOSTOK".** This system operates separately from the main grid. It covers the far eastern part of Russia and consists of four Local Electricity Systems generating 41.0 TW·h or 4.4% of total electricity generation in 2000. There is a limited amount energy exchange between the two main country systems.

- **Isolated Local Electricity Systems.** There are five rather small systems situated in remote regions where communication with the rest of the country is difficult. Despite their small size, they are very important locally. In 2000, these systems generated 1.2 TW·h or 0.1% of total electricity generation.

At present, all electricity distribution systems are owned by joint-stock companies with 50% government participation. The basic structure of the national electricity sector is presented in Figure 2. Federal and regional energy commissions are responsible for energy planning.

2.2. Decision Making Process

- Pricing and taxation constitute the core of the new energy policies. The liberalization of oil, petroleum products and coal prices, which was undertaken in mid-1993, was not extended to the products of the so-called natural monopolies: natural gas, electric power, and heat from centralized sources. Prices for these energy sources are currently set by the federal regional government agencies responsible for the functions of the fuel and energy sector.

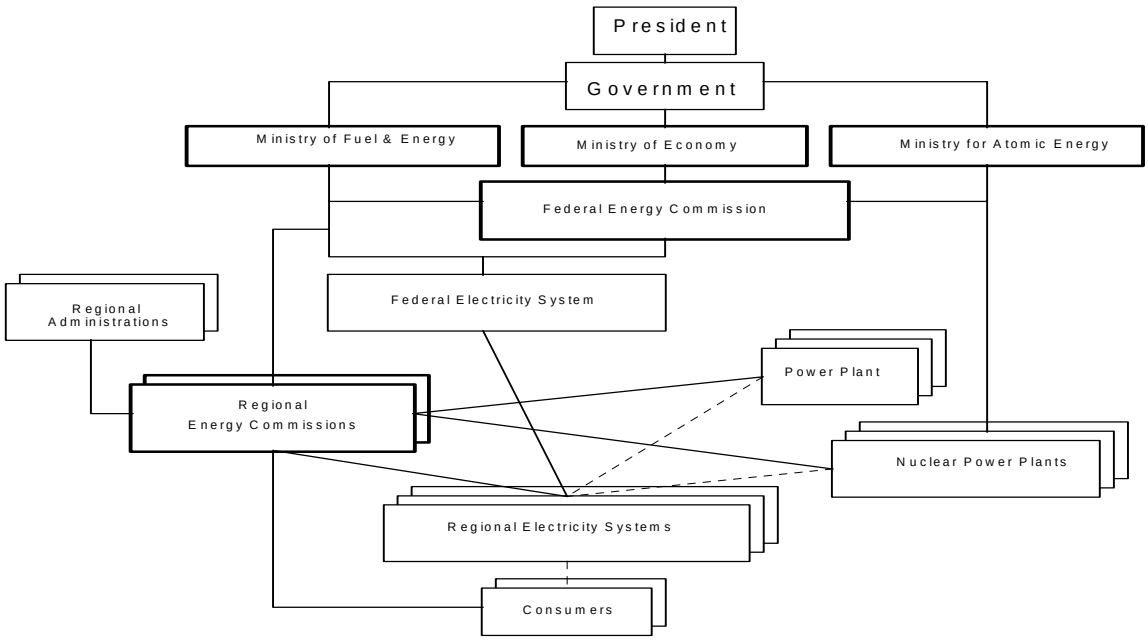

FIG. 2. Basic Structure of the National Electricity Sector

- The creation of a competitive environment within the fuel and energy sector of the national economy will be directed towards reducing production costs and increasing the quality of energy related services. This will be accomplished though industry denationalisation, primarily through the joint-stock companies.
- A system of incentives and conditions for the conservation of energy, as well as the increase in energy production efficiency, is needed in order to realize Russia's vast potential for energy conservation.
- Economic policies will be focused on the promotion of investment activities.

2.3. Main Indicators

Table 7 shows the historical electricity production data and installed capacities and Table 8 the energy related ratios.

TABLE 7. ELECTRICITY PRODUCTION AND INSTALLED CAPACITY

												Growth rate (%)
	1970	1980	1990	1993	1994	1995	1996	1997	1998	1999	2000	1980 to 1999
Electricity production (TW·h)												
- Total [(1)]	470	805	1082	957	876	860	847	834	827	846	862	0.3
- Thermal	373	622	797	663	601	583	583	567	564	563	568.5	-0.5
- Hydro	94	129	167	175	177	177	155	158	159	161	165.4	1.2
- Nuclear	4	54	118	119	98	100	109	109	104	122	129	4.1
Capacity of electrical plants (GW(e))												
- Total	105.1	165.4	213.3	213.4	214.9	215.0	214.5	214.2	214.1	214.3	204.5	1.4
- Thermal	81.3	121.1	149.7	148.8	149.7	149.7	149.2	149.0	148.7	148.3	138.9	1.1
- Hydro	23.0	35.1	43.4	43.4	44.0	44.0	44.0	43.9	44.1	44.3	44.4	1.2
- Nuclear	0.8	9.2	20.2	21.2	21.2	21.3	21.3	21.3	21.3	21.7	24.3	4.3

[(1)] Electricity losses are not deducted.
Source: Russian Annual Statistical Transactions, Moscow (2000)

TABLE 8. ENERGY RELATED RATIOS

	1970	1980	1990	1992	1993	1994	1995	1996	1997	1998	1999	2000
Energy consumption per capita (GJ/capita)	160	250	260	232	219	192	N/A	193	181	176	179	182
Electricity per capita (kW·h/capita)	N/A	N/A	7,311	6,785	6,436	5,903	5,799	5,723	5,654	5,622	5,767	N/A
Electricity production/Energy production (%)	N/A	N/A	18	19	19	19	N/A	18	18	17.7	18	18
Nuclear/Total electricity (%)	0.74	6.71	10.91	11.89	12.43	11.19	11.63	12.87	13.07	12.58	14.42	15
Ratio of external dependency (%) [1]	N/A	N/A	N/A	-39	-38	-45	N/A	-51	-55	-58	-59	-60
Load factor of electricity plants												
- Total (%)	51.0	55.4	57.9	54.2	51.2	46.5	45.7	45.0	44.4	44.1	45.1	48
- Thermal	52.4	58.5	60.8	54.9	50.9	45.8	44.5	44.5	43.4	43.3	43.3	47
- Hydro	46.7	41.8	43.9	45.4	46.0	45.9	45.9	40.1	41.1	41.2	41.5	39
- Nuclear	49.9	66.8	66.7	67.6	64.1	52.8	53.6	58.3	58.4	55.7	64.2	69

[1] Net import / Total energy consumption

Source: IAEA Energy and Economic Database; Russian Annual Statistical Transactions, Moscow (2000).

3. NUCLEAR POWER SITUATION

3.1. Historical Development

1937	Commencement of active experimental studies on the structure of atomic nuclei. Production of “pulse” amount of neptunium and plutonium in Leningrad Radium Institute.
1939	The start of research into the feasibility of achieving a nuclear chain reaction. Installation of the largest cyclotron in Europe in the Leningrad Physical and Technical Institute.
1940	Discovery of phenomenon of spontaneous nuclear fission in uranium. Theoretical demonstration by Soviet scientists of the feasibility of energy release from a uranium nuclear fission chain reaction.
1942	Recommencement of work on the atomic problem interrupted by the outbreak of the war.
1943	Creation of a special physics laboratory - the No. 2 Laboratory in Moscow (now the Russian Scientific Centre “Kurchatov Institute”).
1945	Establishment of a governmental interdepartmental body - the First Chief Administration to co-ordinate all work in the field of atomic science and technology.
1945/46	Technology mastering and organization of the production of metallic uranium and high-purity reactor graphite to start up the first experimental reactor.
1946	Achievement of a controlled uranium fission chain reaction at the No. 2 Laboratory.
1948	Start up of the first industrial nuclear reactor.
1949	Testing of the Soviet Union’s first atomic bomb.
1953	Establishment of the USSR Ministry of Medium Machine Building as the authority dealing with nuclear science and technology.
1954	Start up of the world’s first nuclear power plant in Obninsk.
1957	Ratification of the Charter of IAEA by the USSR.
1964	Commissioning of the first commercial water-moderated, water-cooled vessel-type (WWER) reactor at Novo-Voronezh. Commissioning of the first commercial boiling water-cooled graphite moderated reactor with nuclear superheating of the steam at Beloyarsk.
1970	Establishment of the International Nuclear Information System (INIS) with the active participation of the USSR.

1973	Commissioning of the first commercial water-cooled graphite-moderated channel-type (RBMK) reactor at Leningrad.
1973	Commissioning of the world's first prototype-scale fast breeder reactor (BN-350) in Aktau for electricity generation and desalinated water production.
1976	Completion of the first nuclear central heating and power plant at Bilibino in the far northeastern part of Russia.
1977	Start up of the RT-1 plant for reprocessing of spent nuclear fuel.
1980	Start up of a commercial power-generating unit powered by BN-600 fast reactor at Beloyarsk. Commissioning of the 1000 MW(e) water moderated, water-cooled reactor (WWER-1000).
1984/86	Commissioning of the Zaporozhie and Balakovo NPP's with WWER-1000 serial reactors with full compliance to the new safety regulation.
1986	Accident at unit 4 of Chernobyl NPP. Ministry for Atomic Energy is organized to be responsible for Nuclear Power Plants operation.
1989	Reorganization of the Ministry of Medium Machine Building and Ministry for Atomic Energy as the USSR Ministry of Atomic Energy and Industry.
1992	Establishment of Ministry for Atomic Energy of the Russian Federation (Minatom of Russia, also known as Ministry for Nuclear Power), which replaced the USSR Ministry of Atomic Energy and Industry.
1993	President Eltsyn and President Bush sign SALT-2 Agreement according to which the strategic offensive weapons should be reduced and limited over 7 years. Beginning of conversion of the Russian weapon highly-enriched uranium (VOU) in compliance with the Russian-US Agreement on nuclear disarmament.
1994	The Russian Federation Government makes decision to cease production of weapon plutonium.
1995	The 50-th anniversary of the nuclear power industry of Russia. Beginning of commercial conversion of highly-enriched uranium into low-enriched uranium (the VOU-NOU project) at the Ural Electrochemical Combine (Novouralsk town, Sverdlovsk Region). The FEI RF SSC, Obninsk, Kaluga Region, puts into service the first phase of the Laser and Nuclear Center for nuclei fission energy direct conversion into laser radiation. The first phase of the diamond production is put into service at the VNIIEF RF NC as a part of the conversion program.
1996	Approval of programs for support of the industry major schools of thought. Sea trials of PETR VELIKY nuclear-powered cruiser are completed. Completion of the removal of the Soviet Nuclear weapons to be disassembled from the CIS countries to Russia
1997	Beginning of batch production of a news header type of munitions for the SRF TOPOL-M missile complex
1998	Decision-making on production of the first batch of pilot uranium-plutonium fuel assemblies. Fabrication of a pilot batch of ADE-2, -4, -5 reactor conversion fuel rods. Approval of the program to develop nuclear power engineering of the Russian Federation from 1998 to 2005 and to 2010. Activities to elaborate a draft "Strategy for Nuclear Power Development" (a 50-ty year forecast) are started
1998	Process to fabricate weapon plutonium base mixed fuel is devised and brought into commercial practice at the Research Institute of Nuclear Reactors State Research Center of the Russian Federation. A pilot batch of that fuel for BOR-60 and BN-600 reactors is fabricated

1998	Establishment of the Information and Analytical Center of Minatom of Russia to ensure information and analytical support of the Ministry administration and of the Industry Emergency Commission both under normal operation and in case of emergency at the industry enterprises.
1999	Commissioning of the Kursk NPP 2 power unit upon completion of overhaul with monitoring of all fuel channels and with their partial substitution according to the check results. That work is carried out in the industry for the first time.
1999	Start of implementation of wide-scale measures to accelerate utilization of nuclear-powered submarines removed from military service and ecological recovery of sites of the Ministry of Defense dangerous installations handed over to Minatom of Russia in compliance with the decision of the Government of the Russian Federation
1999	The 50-th anniversary of the Nuclear weapons of Russia. The nuclear weapon system is now a model of Research and Development Associations with the worldwide significance high-capacity pilot-scale productions enabling to tackle large-scale high technology problems.

3.2. Status and Trends of Nuclear Power

Figure 3 shows the map of Russian nuclear power plants. Table 9 shows the current status of the Russian nuclear power plants. In the former Soviet Union, there were 10 nuclear reactors under construction at the late 80s. However, the construction of all new nuclear power plants was interrupted in 1989-1990, partly due to negative public opinion. Today, economical difficulties play a more significant role. In fact, unit 1 of Rostov NPP commenced commercial operation on 30 March 2001 and only 3 reactors are currently under construction (unit 2 of Rostov NPP, unit 5 of Kursk NPP and unit 3 of Kalinin NPP).

The production of electricity from nuclear power plants has remained relatively stable throughout the period of economic transition with an average load factor of 67% from 1990 to 1993. Because of long refurbishment of Leningrad NPP, load factor decreased and was between 52.6% and 58.4% in the period until 1998. In 1999, the average load factor rose to 64.2%. Table 10 shows the NPPs electricity generation share for this period and Table 11 the operational facts of the NPPs in 2000.

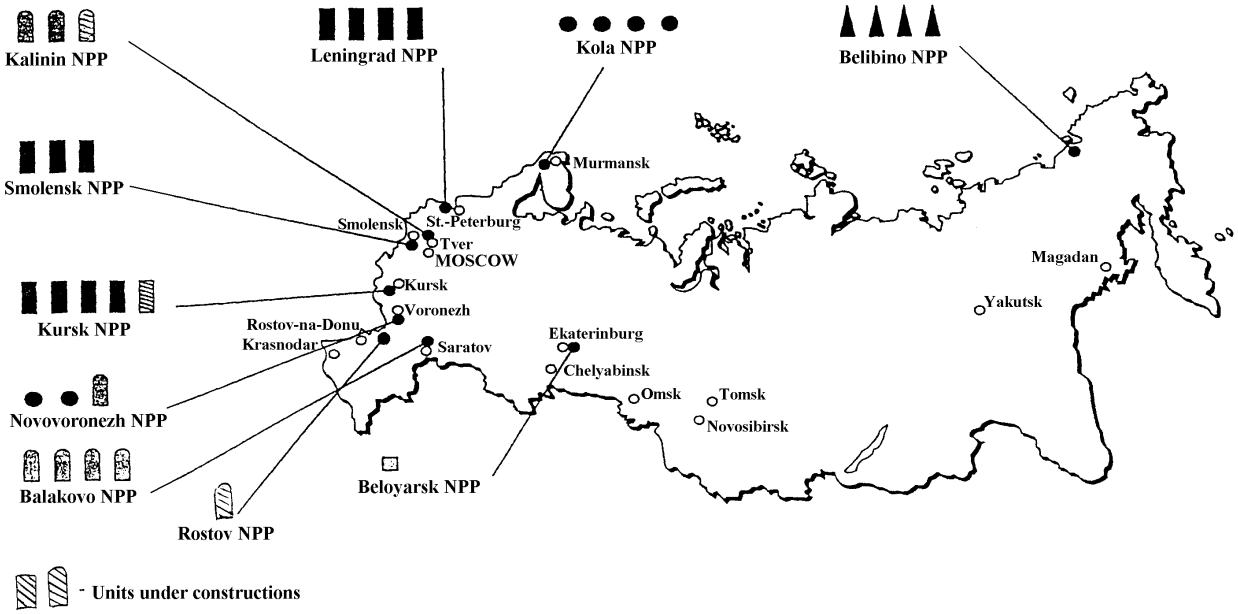

FIG. 3. Map of Russian Nuclear Power Plants

TABLE 9. STATUS OF NUCLEAR POWER PLANTS

Station	Type	Net Capacity	Operator	Status	Reactor Supplier	Construction Date	Criticality Date	Grid Date	Commercial Date	Shutdown Date
BALAKOVO-1	WWER	950	REA	Operational	MNE	01-Dec-80	12-Dec-85	28-Dec-85	23-May-86	
BALAKOVO-2	WWER	950	REA	Operational	MNE	01-Aug-81	02-Oct-87	08-Oct-87	18-Jan-88	
BALAKOVO-3	WWER	950	REA	Operational	MNE	01-Nov-82	16-Dec-88	25-Dec-88	08-Apr-89	
BALAKOVO-4	WWER	950	REA	Operational	MNE	01-Apr-84	03-Apr-93	11-Apr-93	22-Dec-93	
BELOYARSKY-3	FBR	560	REA	Operational	MNE	01-Jan-69	26-Feb-80	08-Apr-80	01-Nov-81	
BILIBINO UNIT A	LWGR	11	REA	Operational	MNE	01-Jan-70	11-Dec-73	12-Jan-74	01-Apr-74	
BILIBINO UNIT B	LWGR	11	REA	Operational	MNE	01-Jan-70	07-Dec-74	30-Dec-74	01-Feb-75	
BILIBINO UNIT C	LWGR	11	REA	Operational	MNE	01-Jan-70	06-Dec-75	22-Dec-75	01-Feb-76	
BILIBINO UNIT D	LWGR	11	REA	Operational	MNE	01-Jan-70	12-Dec-76	27-Dec-76	01-Jan-77	
KALININ-1	WWER	950	REA	Operational	MNE	01-Feb-77	10-Apr-84	09-May-84	12-Jun-85	
KALININ-2	WWER	950	REA	Operational	MNE	01-Feb-82	25-Nov-86	03-Dec-86	03-Mar-87	
KOLA-1	WWER	411	REA	Operational	MNE	01-May-70	26-Jun-73	29-Jun-73	28-Dec-73	
KOLA-2	WWER	411	REA	Operational	MNE	01-Jan-73	30-Nov-74	09-Dec-74	21-Feb-75	
KOLA-3	WWER	411	REA	Operational	MNE	01-Apr-77	07-Feb-81	24-Mar-81	03-Dec-82	
KOLA-4	WWER	411	REA	Operational	MNE	01-Aug-76	07-Oct-84	11-Oct-84	06-Dec-84	
KURSK-1	LWGR	925	REA	Operational	MNE	01-Jun-72	25-Oct-76	19-Dec-76	12-Oct-77	
KURSK-2	LWGR	925	REA	Operational	MNE	01-Jan-73	16-Dec-78	28-Jan-79	17-Aug-79	
KURSK-3	LWGR	925	REA	Operational	MNE	01-Apr-78	09-Aug-83	17-Oct-83	30-Mar-84	
KURSK-4	LWGR	925	REA	Operational	MNE	01-May-81	31-Oct-85	02-Dec-85	05-Feb-86	
LENINGRAD-1	LWGR	925	LENNPP	Operational	MNE	01-Mar-70	12-Sep-73	21-Dec-73	01-Nov-74	
LENINGRAD-2	LWGR	925	LENNPP	Operational	MNE	01-Jun-70	06-May-75	11-Jul-75	11-Feb-76	
LENINGRAD-3	LWGR	925	LENNPP	Operational	MNE	01-Dec-73	17-Sep-79	07-Dec-79	29-Jun-80	
LENINGRAD-4	LWGR	925	LENNPP	Operational	MNE	01-Feb-75	29-Dec-80	09-Feb-81	29-Aug-81	
NOVOVORONEZH-3	WWER	385	REA	Operational	MNE	01-Jul-67	22-Dec-71	27-Dec-71	29-Jun-72	
NOVOVORONEZH-4	WWER	385	REA	Operational	MNE	01-Jul-67	25-Dec-72	28-Dec-72	24-Mar-73	
NOVOVORONEZH-5	WWER	950	REA	Operational	MNE	01-Mar-74	30-Apr-80	31-May-80	20-Feb-81	
SMOLENSK-1	LWGR	925	REA	Operational	MNE	01-Oct-75	10-Sep-82	09-Dec-82	30-Sep-83	
SMOLENSK-2	LWGR	925	REA	Operational	MNE	01-Jun-76	09-Apr-85	31-May-85	02-Jul-85	
SMOLENSK-3	LWGR	925	REA	Operational	MNE	01-May-84	01-Dec-89	17-Jan-90	30-Jan-90	
KALININ-3	WWER	950	REA	Under Constr.	MNE	01-Oct-85				
KURSK-5	LWGR	925	REA	Under Constr.	MNE	01-Dec-85				
SOUTH URALS 1	FBR	750	MAYAK	Under Constr.	MNE	01-Jan-93				
SOUTH URALS 2	FBR	750	REA	Under Constr.	MNE	01-Jan-93				

Source: IAEA Power Reactor Information System as of 31 December 2000

TABLE 9. CONTINUED. STATUS OF NUCLEAR POWER PLANTS

Station	Type	Capacity	Operator	Status	Reactor Supplier	Construction Date	Criticality Date	Grid Date	Commercial Date	Shutdown Date
BELOYARSKY-4(BN-800)	FBR	750	REA	Under Constr.						
ROSTOV-1	WWER	950	REA	Operational*.		01-Sep-81	17-Feb-01*		30-Mar-01*	
BILIBINO E	LWGR	31	REA	Planned						
BILIBINO F	LWGR	31	REA	Planned						
BILIBINO G	LWGR	31	REA	Planned						
BN-1600	FBR	1500	REA	Planned						
SOUTH URALS 3	FBR	750	REA	Planned						
BELOYARSKY-1	LWGR	102	REA	Shut Down		01-Jun-58	01-Sep-63	26-Apr-64	26-Apr-64	01-Jan-83
BELOYARSKY-2	LWGR	146	REA	Shut Down		01-Jan-62	10-Oct-67	29-Dec-67	01-Dec-69	01-Jan-90
NOVOVORONEZH-1	WWER	197	REA	Shut Down		01-Jul-57	17-Dec-63	30-Sep-64	31-Dec-64	16-Feb-88
NOVOVORONEZH-2	WWER	336	REA	Shut Down		01-Jul-64	23-Dec-69	27-Dec-69	14-Apr-70	29-Aug-90

Source: IAEA Power Reactor Information System as of 31 December 2000.

* Source: Russian nuclear power plants, Rosenergoatom, Moscow 2001

TABLE 10. NPP ELECTRICITY GENERATION SHARE

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Electricity generated at NPP's in Russia (10^9 kW·h)	118.0	120.0	119.6	119.2	97.8	99.3	108.8	108.4	103.5	120.0	128.9
NPP electricity generation share (%,)											
Total	11.2	11.5	12.1	12.7	11.4	11.8	13.1	13.2	12.8	15.0	15.0
Central Power Pool	21.7	21.3	22.7	23.9					25.1	30.0	29.2
Middle Volga Power Pool	10.9	13.6	17.9	16.4					21.8	29.2	29.2
Northwest Power Pool	46.7	47.4	43.9	47.8					36.6	41.0	39.0

Source: Country Information.

TABLE 11. STATUS OF NUCLEAR POWER PLANTS
- OPERATIONAL FACTS IN 2000

NPP, Unit	Capacity Installed, MW(e)	Electricity Generation, 10^6 kW·h	Load Factor, %
Balakovo	4,000	27,449.0	78.10
1	1,000	7,624.6	86.80
2	1,000	6,050.9	68.90
3	1,000	6,793.2	77.34
4	1,000	6,980.2	79.50
Kalinin	2,000	13,339.0	75.90
1	1,000	6,604.3	75.20
2	1,000	6,735.2	76.70
Kola	1,760	8,833.0	57.10
1	440	1,436.2	37.20
2	440	2,634.3	68.20
3	440	2,419.7	62.60
4	440	2,342.7	60.60
Novovoronezh	1,834	11,102.0	68.90
3	417	2,838.0	77.50
4	417	2,682.0	73.20
5	1,000	5,581.0	63.50
Beloyarsk	600	3,860.0	73.20
3	600	3,860.0	73.20
Bilibino	48	248.8	59.00
1	12	70.2	66.60
2	12	57.2	54.30
3	12	55.5	52.70
4	12	65.9	62.50
Kursk	4,000	22,165.0	63.10
1	1,000	3,826.4	43.60
2	1,000	4,057.2	46.20
3	1,000	6,942.5	79.04
4	1,000	7,338.6	83.60
Leningrad	4,000	22,817.0	63.82
1	1,000	7,171.0	81.90
2	1,000	7,083.0	80.90
3	1,000	8,563.0	97.50
4	1,000	0.0	0.00
Smolensk	3,000	20,270.0	76.90
1	1,000	5,563.7	64.15
2	1,000	7,073.1	80.52
3	1,000	7,567.2	86.15
Total	21,242	128,900.0	72.50

Source: Country Information.

The Concept of the Nuclear Power Development Programme in the Russian Federation was approved by the Ministry for Atomic Energy Board on 14 July 1992. This concept determines the general goal of the Programme, the main objects within the determined time period, the main stages of programme implementation, and primary nuclear power plant projects. It considers conditions for the nuclear power plant fuel supply and proposes various options of nuclear power development assuming decommissioning of the first and second generation power units of 9 GW of installed power.

The general goal of the Programme, as determined by the Concept, envisages replacement of decommissioned nuclear and fossil fuelled plants with improved and safer third generation nuclear power plants. The Concept also assumes that the energy situation will favour a large-scale nuclear power development by 2030 with 30 to 35% share of total electricity production and 40 to 50% in the European part of the country. Nuclear power development projections up to year 2010 (see Table 12) and beyond assume the following main stages:

- 1993-2000: a stage of renovation, with nuclear power units in operation being modernized, their safety enhanced, and total capacity but slightly increased through new construction;
- 2000-2010: the stage that should be characterized by industry growth on the basis of units of a new generation; work should begin by shutting down those units that have completed service life;
- after 2010: a stage that is seen as a period of large-scale nuclear power growth combining evolutionary developments in traditional technologies with the development of new ones.

The leading 3rd generation medium and large scale power units of improved safety now include NP-500, NP-1000, VPBER-600, AST-500M (all of PWR design) and MKER-800 (LWGMR) reactors. Fast reactor development has been demonstrated by the BN-800 (LMR) design. The concept of utilization of released weapon-grade plutonium is under development at the nuclear complex "MAYAK", including a MOX fuel fabrication plant and three to four BN-800 reactors. Studies are under way for selecting the optimal reactor design for utilization of this weapon-grade plutonium.

TABLE 12. OPTIONS OF NUCLEAR POWER DEVELOPMENT IN THE POWER SECTOR OF RUSSIA (INSTALLED CAPACITY GW)

Options	2001-2005	2006-2010
Minimum	21.6	25.5
Reference	28-31	30-34
Maximum	30.7	39.5

	Options	2005	2010	2015	2020
Programme (gross)	Low	25.3	28.0		
	High	26.9	35.2		
Expert (net)	Low	20.1	19.9	16.7	19.1
	High	23.6	26.2	30.8	30.9

Source: Country Information.

3.3. Current Policy Issues

3.3.1. Ownership in the Nuclear Sector

The Ministry for Atomic Energy adopted a restructuring approach for the privatization of the nuclear industry and a number of joint-stock companies have been established with 51% share retained by state.

3.3.2. Financial Situation

The national economical crisis led to the fact that the Russian nuclear industry is now facing serious financial problems. State funding has dwindled while non-payment of electricity has reduced revenues from nuclear electricity generation. Minatom responded to the financial challenges with a variety of measures, particularly, by increasing the export of nuclear-related production and services.

3.3.3. Nuclear Development

The current nuclear policy in Russia was formulated by the Minatom in the 1998 "Programme of Nuclear Power Development of the Russian Federation for 1998 – 2005 and Prospects up to the Year 2010" approved by the Government of the Russian Federation on July 21 1998. Its main objectives are as follows:

i) assuring the safety of operating nuclear plants including those constructed in accordance with old regulations and the safety enhancement of nuclear power plants under construction;
ii) development of improved new-generation plants;
iii) feasibility studies on the advanced reactor concepts;
iv) R&D work on closed nuclear fuel cycle;

v) R&D efforts on decommissioning of nuclear power plants;
vi) development of cost-effective and environmentally safe spent fuel and radioactive waste management technology;
vii) safe operation of the research reactors, critical assemblies and other nuclear facilities;
viii) remodelling research centres, experimental facilities and industrial units which support the nuclear industry development programme.

3.4. Organizational Chart

Figure 4 shows the institutional organization of the nuclear industry in Russia.

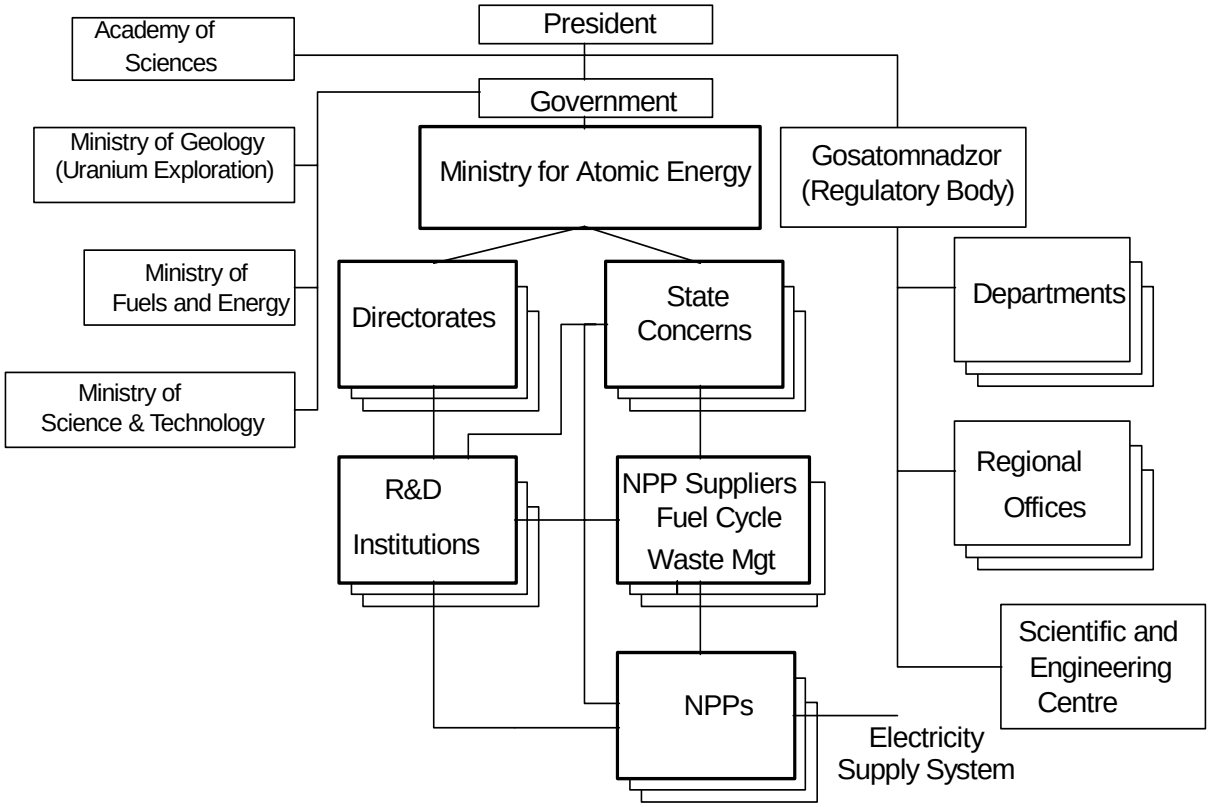

FIG. 4. Institutional Organization of Nuclear Industry in Russia

- departments of the Gosatomnadzor (Regulatory body):

  - science and engineering;
  - NPP nuclear and radiation safety;
  - research reactor nuclear and radiation safety;
  - nuclear power plant design and construction supervision;
  - nuclear equipment production supervision;
  - radiation safety supervision;
  - nuclear and radiation safety regulating.

- directorates of the Ministry for Atomic Energy:

  - design and investment;
  - information, nuclear materials and installations protection;
  - nuclear ammunition design and testing;
  - nuclear ammunition production;

- nuclear chemistry;
- science and technology;
- nuclear reactor development and designing;
- nuclear physics and fusion;
- nuclear power advancement;
- information and public relation.

- state concerns under the Ministry for Atomic Energy:

  - Atomredmetzoloto (uranium mining);
  - TVEL (fuel fabrication);
  - Rosenergoatom (nuclear utility company);
  - Progress (construction and industrial holding company);
  - Atomstroi (construction company);
  - Spetsatommontazh (industrial company);
  - Spetsstroimaterialy (construction materials for nuclear industry);
  - Tekhsnabexport (export company);
  - Eleron (security technology company).

4. NUCLEAR POWER INDUSTRY

In this chapter, only the major nuclear industry organizations are listed. These organizations are mainly within the Ministry for Atomic Energy. However, a few institutions, like the Kurchatov Institute, involved in nuclear related activities are not within the Minatom. There are also some academic institutes as well as organizations within the Ministry for Marine Ship-Building (involved in nuclear powered ice-breaker design) and others (including some small private-owned companies).

4.1. Supply of Nuclear Power Plants

Architect engineers:

- All-Russia Scientific Research and Design Institute of Power Technology (VNIPIET), St. Petersburg;
- Institute “Atomenergoproekt” (AEP), and its branches in Moscow, St. Petersburg, Nizhny Novgorod;
- State Institute of Construction and Design (GSPI), Moscow.

NSS main suppliers:

- "Atommash", an open-end joint stock company - NSS WWER-1000, BN and AST, Volgodonsk;
- “Izhorskie zavody”, an open-end joint stock company - NSS WWER-1000 and WWER-440, St. Petersburg;

Main component suppliers:

- “Leningradskiy metallicheskiy zavod”, an open-end joint stock company - turbines for NPP’s, St. Petersburg;
- “Podolskiy mashinostroitelniy zavod”,, an open-end joint stock company - steam generators, separators, piping, etc., Podolsk.

4.2. Operation of Nuclear Power Plants

The State Enterprise “Rosenergoatom”, under the Ministry for Atomic Energy, is a nuclear power plant operating organization in the Russian Federation. It operates eight Russian nuclear power plants (Leningrad Nuclear Power Plant is an independent utility in the Minatom structure). “Rosenergoatom” performs the following functions:

- construction and operation of NPPs in the territory of the Russian Federation;
- maintenance and repair activity;
- operation and emergency planning;
- technical supervision and support;
- financial activity;
- public relations;
- international co-operation;
- research and development (R&D) effort.

4.3. Fuel Cycle and Waste Management Service Supply

"Atomredmetzoloto" is a production complex dealing with supplying of uranium, rare and precious metals and other materials used in nuclear power. The company consists of mining and processing enterprises and organizations in six newly independent CIS countries - Russia, Ukraine, Kazakstan, Uzbekistan, Kyrghyzstan and Tajikistan.

Uranium Enrichment Complex: Russian plants - located at Ekaterinburg (former Sverdlovsk), Tomsk, Angarsk and Krasnoyarsk - for uranium isotope enrichment are high-technology facilities based on the fifth generation of gas centrifuges. The capacity of enrichment industry meets all the requirements for nuclear fuel in Russia and the CIS countries and former Soviet block countries in Eastern Europe.

"TVEL", an open-end joint stock company, is a self-sufficient interstate production and economic complex of enterprises of the Russian Federation, Kazakstan, Ukraine and Estonia. The company's main line of work are nuclear fuel production and fabrication of metals, alloys and other materials used in nuclear power. Its manufacturing facilities are located in Russia, Ukraine, Kazakstan and Estonia.

4.4. Research and Development Activities

Fundamental Research

- Institute of Theoretical and Experimental Physics, Moscow;
- Institute of High Energy Physics, Protvino;
- Institute of Innovation and Thermonuclear Research, Troitsk.

These are major nuclear industry research centres that carry out extensive fundamental theoretical and experimental investigations into the properties of the atomic nucleus and elementary particles, plasma and laser physics, thermonuclear fusion, development of new types of accelerator and reactor technology, and equipment and facilities for physical research.

Applied Research and Development (R&D)

- The Russian Scientific Centre (RSC) "Kurchatov Institute", Moscow;
- The State Scientific Centre "Institute of Physics and Power Engineering" (SSC FEI), Obninsk;
- The State Scientific Centre "All-Russian Inorganic Materials Research Institute" (SSC VNIINM), Moscow;
- The State Scientific Centre Nuclear Reactor Research Institute (SSC NIIAR), Dimitrovgrad;
- Research and Development Institute of Power Engineering (NIKIET), Moscow.

All are major scientific centres in the field of nuclear science and technology. Theoretical and experimental research on nuclear and particle physics, neutron physics, thermophysics, hydraulics, material science, nuclear safety performed at these institutes has received world-wide recognition.

The All-Russian Research Institute for Nuclear Power Plant Operation (VNIIAES) of Moscow, is the scientific centre for Russian nuclear operating organizations. Principal attention is paid to assuring safe operation of the 1st and 2nd generation nuclear power plants.

Major reactor and NSSS design and research

- Experimental Design Bureau "Gidropress" (OKB GP), Podolsk;
- Experimental Design Bureau of Machine Building (OKBM), Nizhny Novgorod.

4.5. International Co-operation in the Field of Nuclear Power Development and Implementation

At present, Russia has agreements on co-operation in nuclear power with the USA, the UK, Germany, France, Italy, Canada, Korea, countries of Eastern and Central Europe and new independent states of the former Soviet Union republics. Current areas of international co-operation include research in nuclear reactor design and safety, nuclear fuel cycle, handling radioactive wastes, fundamental research in physics, nuclear industry conversion and nuclear non-proliferation.

On 27 November 1992, the United States, Japan, the EC and Russia signed an Agreement on Establishing an International Scientific and Technological Centre in Moscow. Canada, Sweden and other countries have already shown their interest in joining the Centre's activity, which is directed at conversion of the defence industry armament to the peaceful use of safe and ecologically clean nuclear energy.

Since the mid-1980's, western countries have been active in nuclear safety co-operation with Russia. An increasing number of agreements have been signed and this co-operation has proved to be mutually beneficial. Today, Russia has bilateral nuclear co-operation agreements with many countries on exchange of experience, information, personnel training, technology transfer and other nuclear related activities.

5. REGULATORY FRAMEWORK

5.1. Safety Authority and the Licensing Procedures

The Russian Federal Supervision of Nuclear and Radiological Safety (Gosatomnadzor) is the Nuclear Regulatory Body of the Russian Federation with the headquarters in Moscow and seven regional offices throughout the country.

The following regulations determine the procedure for nuclear power plant licensing:

- Regulations on the order of special permission issued by Gosatomnadzor of Russia for examination of design and other materials and documents, substantiating safety of nuclear and radiologically dangerous installations and works: RD-03-12-94.
- Regulations on arranging and carrying out examination of design and other materials and documents, substantiating safety of nuclear and radiologically dangerous installations and works: RD-03-13-94.
- Regulations on the order of issuing of special temporary permissions for designing nuclear and radiologically dangerous installations and works: RD-03-14-94.

The stages of obtaining the temporary permission (license) for NPP unit operation can be represented in brief as follows:

i) License demand (submission of application documents);
ii) Gosatomnadzor decision on the demand control;
iii) Analysis of substantiating materials of demand;

iv) Inspection at the NPP;
v) Conclusion on substantiating materials examination;
vi) Conclusion on NPP inspection;
vii) General conclusion on obtaining temporary permission (license);
viii) License (temporary permission).

5.2. Main National Laws and Regulations

In the near future, the main laws controlling nuclear power in Russia will be the law "About utilization of atomic energy" and the law "About state policy in the field of radioactive waste management". Final approval of the law "About utilization of atomic energy" is conditioned by the problems related with property rights in the nuclear industry, nuclear safety and radioactive materials treatment. Presently, several documents serve for this purpose.

Technical regulations created by Gosatomnadzor of Russia, which are in force today, are the legal framework for nuclear energy utilization. These regulations and rules address the aspects of safety assurance during site selection, designing, construction, operation, and decommissioning of nuclear installations. All regulating documents developed by Gosatomnadzor have been compiled into a “List of main scientific and technical documents, used by Gosatomnadzor for safety regulation and supervision during production and utilization of atomic energy, handling of nuclear materials, radioactive substances and articles on their base”, P-01-01-92, Gosatomnadzor of Russia, 1992.

Some aspects of nuclear related activity are regulated by decrees of the President or Government of the Russian Federation.

Decrees of the President:

- "About the control of export of nuclear materials, equipment and technologies" of 27 March 1992;
- "About the utilities with nuclear power plants " of 7 September 1992;
- "About privatization of enterprises under the authority of Ministry for Atomic Energy, and their management in a market economy " of 15 April 1993, etc.

Decrees of the Government:

- "About approval of documents, regulating export of equipment and materials and of corresponding technology, used for nuclear purposes" of 29 May 1992;
- “About measures of protection of the population living adjacent to nuclear power installations" of 15 October 1992, etc.

5.3. International, Multilateral and Bilateral Agreements

AGREEMENTS WITH THE IAEA

• Amendments to Articles VI & XIV of the Agency statute	Not ratified	
• Agreement on privileges and immunities	Entry into force:	1 July 1966
• Unilateral safeguards submission (Voluntary offer) INFCIRC/327	Entry into force:	10 June 1985
• Additional Protocol	Signed:	22 March 2000

• Supplementary agreement on provision of technical assistance by the IAEA	Not yet concluded	

MAIN INTERNATIONAL TREATIES

• NPT	Entry into force:	5 March 1970
• Convention on physical protection of nuclear material	Entry into force:	8 February 1987
• Convention on early notification of a nuclear accident	Entry into force:	24 January 1987
• Convention on assistance in the case of a nuclear accident or radiological emergency	Entry into force:	26 February 1987
• Vienna convention on civil liability for nuclear damage	Signature:	8 May 1996
• Paris convention on civil liability for nuclear damage	Not applicable	
• Joint protocol relating to the application of Vienna and Paris conventions	Non-Party	
• Protocol to amend the Vienna convention on civil liability for nuclear damage	Non-Party	
• Convention on supplementary compensation for nuclear damage	Non-Party	
• Convention on nuclear safety	Entry into force:	24 October 1996
• Joint convention on the safety of spent fuel management and on the safety of radioactive waste management	Signature:	27 January 1999

OTHER RELEVANT INTERNATIONAL TREATIES/UNDERTAKINGS

• Improved procedures for designation of safeguards inspectors	Waiver proposal accepted by U.S.S.R. on	15 September 1988
• ZANGGER Committee	Member	
• Nuclear Suppliers Group	Member	

• Acceptance of NUSS Codes	Summary: A good basis for national safety standards. Taken into account in preparation of regulatory/ technical documents. Best form of application in USSR being studied: 30 December 1988
• Nuclear Export Guidelines	Adopted
• World Association of Nuclear Operators (WANO)	Member

BILATERAL AGREEMENTS

Bilateral agreements on peaceful use of atomic energy have been signed with USA, UK, Germany, France, Italy, Canada, Republic of Korea, Switzerland and some other countries.

1. "Bilateral Agreement between Governments of the Russian Federation and the United States of America on Scientific and Technical Co-operation in the Field of Management of Plutonium Withdrawn from Nuclear Military Programmes". Moscow, July 24, 1998.
2. "Threelateral Agreement between Governments of Russian Federation and Federal Republic of Germany and Republic of France on Co-operation in the Field of Peaceful Utilization of Plutonium Being Released as a Results of Dismantling of Russian Nuclear Weapons".
3. Russia – US "Agreement on Co-operation in Research on Radiation Effects for the Purpose of minimize the consequences of the Radioactive Contamination on Health and environment". Moscow, January 14, 1994.
4. Russia – US "Agreement on Increasing of Operational Safety, Measures to Decrease Risk and on Nuclear Safety Standards of Civil Nuclear Facilities in Russian Federation". Moscow, December 16, 1993.

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[22] IAEA Power Reactor Information System (PRIS).

Appendix

DIRECTORY OF THE MAIN ORGANIZATIONS, INSTITUTIONS AND COMPANIES INVOLVED IN NUCLEAR POWER RELATED ACTIVITIES

NATIONAL ATOMIC ENERGY AUTHORITIES

Ministry of Atomic Energy (MINATOM)
Staromonetny pereulok 26
109180 Moscow

Tel: (7 095) 239 4908
Fax: (7 095) 230 2420
Telex: 411888 MEZON SU
http://www.x-atom.ru/minatom/min_eng.html

Federal Nuclear and Radiation Safety Authority
Taganskaya ulitsa 34
109147 Moscow

Tel: (7 095) 272 0349
Fax: (7 095) 278 0098
Tlx: 411743 SYVIN SU

State Supervisory Committee
for Nuclear Safety and Radiation Protection

Fax: (7095) 278 8090

OTHER NUCLEAR ORGANIZATIONS

Consortium of Russian Nuclear Power Plants
“ROSATOMENERGO"
B. Ordynka 24/26
K-74 Moscow 103074

Tel: (7 095) 239 24 22
Fax: (7 095) 239 27 24
http://www.rosatom.ru/

Obninsk Institute for
Physics and Power Engineering
Bondarenko Sq. 1
249020 Obninsk, Kaluga region

Tel: (708439) 9 82 50
Fax: (7095) 230 23 26
http://www.ippe.obninsk.ru/

All-Russia Scientific Research and Design
Institute of Power Technology -VNIPIET
Dibunovskaya Str.
St. Petersburg

Tel: (812) 239 01 34
Fax: (812) 239 18 98

Nuclear Safety Institute (IBRAE)

http://www.ibrae.ac.ru/

Institute “Atomenergoproekt” (AEP)
Bakunin Str. 7
Moscow

Tel: (7095) 261 41 87

"Atommash"
Krasnoarmeyskaya Str. 206
Volgodonsk
Rostov reg.

“Izhorskie zavody”
Kolpino-1, Lenin Str. 1
St. Petersburg

Fax: (812) 463 92 69

“Rosenergoatom” Kitaisky pr. 7 Moscow	 Tel: (7095) 220 63 01 Fax: (7095) 220 44 88
"Atomredmetzoloto" Bolshaya Ordynka Str. Moscow	 Tel: (7095) 239 44 11 Fax: (7095) 239 46 79
TVEL Concern, Inc. Bolshaya Ordynka Str. Moscow	 Tel: (7095) 239 43 55 Fax: (7095) 233 10 59
Russian Scientific Centre (RSC) “Kurchatov Institute" Kurchatov Sq. 1 Moscow	Tel: (7095) 196 92 41 http://www.kiae.ru/
State Scientific Centre "All-Russian Inorganic Materials Research Institute" (SSC VNIINM) Rogov Str. 5a Moscow 123060	Tel: (7095) 190 82 97 Fax: (7095) 196 41 68
State Scientific Centre "Nuclear Reactor Research Institute" (SSC NIIAR) Box M-5881 Dimitrovgrad Ulyanovsk Region	Tel: (84235) 3 52 80 Fax: (84235) 3 56 48 http://www.niiar.simbirsk.su/eng/riarsb.htm
All-Russian Research Institute for Nuclear Power Plant Operation (VNIIAES) Ferganskaya Str. 25 Moscow	 Tel: (7095) 377 00 75 Fax: (7095) 274 00 73
Research and Development Institute of Power Engineering (NIKIET) P.O.Box 788 Moscow	Fax: (7095) 975 20 19
Experimental Design Bureau of Machine Building (OKBM) Burnakovsky pr. 15 Nizhny Novgorod	Tel: (8312) 46 21 32 Fax: (8312) 41 87 72
Experimental Design Bureau "Gidropress" (OKB GP) Ordzhonikidze Str. 24 Podolsk Moscow region	 Tel: (7095) 137-90-96
Leningrad Nuclear Power Plant	http://www.laes.sbor.ru/

NUCLEAR RESEARCH INSTITUTES

Budker Institute of Nuclear Physics (BINP)	http://www.inp.nsk.su/

Frank Laboratory of Neutron Physics (FLNP)	http://nfdfn.jinr.ru/
Institute of General and Nuclear Physics (Kurchatov Institute)	http://www.ignph.kiae.ru/
Ioffe Institute for Physics and Technology	http://www.ioffe.rssi.ru/
Khlopin Radium Institute	http://www.atom.nw.ru/RIE/
Moscow Power Engineering Institute	http://mpei.ac.ru/
St. Petersburg Nuclear Physics Institute	http://www.pnpi.spb.ru/

HIGH ENERGY INSTITUTES

Bogoliubov Laboratory of Theoretical Physics (BLTP)	http://thsun1.jinr.ru/
Flerov Laboratory of Nucler Reactions (FLNR)	http://sungraph.jinr.dubna.su/flnr/
Institute for Nuclear Research (INR)	http://www.inr.ac.ru/
International Center for Fundamental Physics	http://www.icfpm.lpi.ru/
Joint Institute for Nuclear Research in Dubna (JINR)	http://cv.jinr.ru/
Laboratory of High Energies (LHE JINR)	http://lhe.jinr.ru/
Laboratory of Nuclear Problems (LNP)	http://nuweb.jinr.ru/
Laboratory of Particle Physics (LPP)	http://sunse.jinr.ru/
Skobeltsyn Institute of Nuclear Physics (SINP, Moscow)	www.npi.msu.su:80/inp50/english/index.html
Saint-Petersburg State University (Radiophysics scientific school)	http://www.phys.spbu.ru/Departments/RadioPhysics/
International Science and Technology Center (ISTC)	http://www.istc.ru/

OTHER ORGANIZATIONS

Republican Research Scientific -Consulting Center for Expertises (RRSCCE)	http://www.extech.msk.su/
Federal Environmental Emergency Response Centre Federal Environmental Emergency Response Centre (FEERC)	http://www.typhoon.mecom.ru/