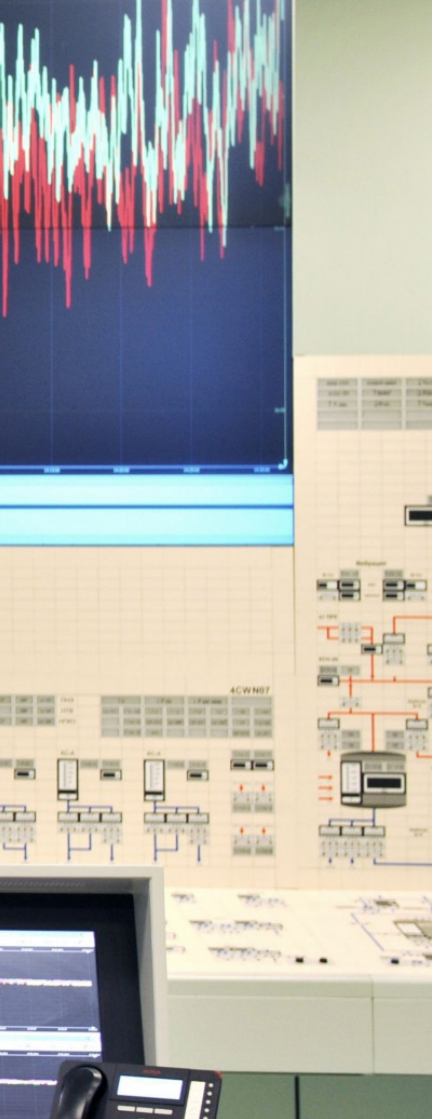
PRIS Power Reactor Information System:

Past, Present and Future

IAEA Nuclear Energy


ПГ-2
ПГ-3



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What is PRIS?

Through its 50 years of collecting nuclear power performance and reactor specification data, PRIS has been the leading international database on nuclear power reactors.

The PRIS public website has more than 150 000 visits annually!

As the responsible and independent steward of nuclear power plant (NPP) data, the IAEA, through PRIS, provides an overview of the status, specification and performance results of every nuclear power reactor in the world.

At present, all IAEA Member States that have nuclear power reactors in operation, under construction, or in the decommissioning stage, consistently submit data to the database. PRIS data and reports are routinely sourced in a series of technical documents and supplementary references. Among the most popular of these publications are the IAEA Annual Report and the Nuclear Technology Review, resources which inform sessions at the IAEA Board of Governors.

PRIS Users:

- International organizations
- Governmental organizations, including regulators
- NPP operators
- Technical support organizations
- Academic organizations, research institutes
- Private sector (e.g. electricity market analysts)
- Media
- IAEA staff
- General public

IAEA | PRIS Power Reactor Information System

World Statistics | Country Statistics | Publications | Glossary | About PRIS

PRIS

The Database on Nuclear Power Reactors

The Power Reactor Information System (PRIS), developed and maintained by the IAEA for over five decades, is a comprehensive database focusing on nuclear power plants worldwide. PRIS contains information on power reactors in operation, under construction, or those being... READ MORE »

Registered User ENTRY | How to Register

SHORTCUTS

Select Country

Select Reactor

2019: Nuclear Power Reactors in the...

2019: Operating Experience with NPP...

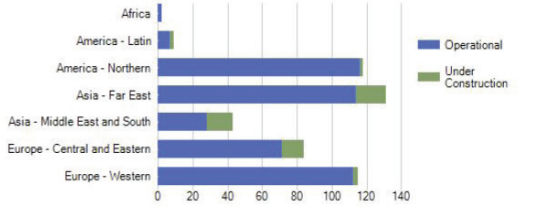
PRIS STATISTICS – User's Manual

OVERVIEW

Current Status:

450	NUCLEAR POWER REACTORS IN OPERATION
399 706	MW_e TOTAL NET INSTALLED CAPACITY
52	NUCLEAR POWER REACTORS UNDER CONSTRUCTION
52 704	MW_e TOTAL NET INSTALLED CAPACITY
18 156	REACTOR-YEARS OF OPERATION

Regional Distribution of Nuclear Power Plants (Click on the chart for more statistics)



HIGHLIGHTS

NPP Status Changes (2019)

Year: 2019

New connections to the grid	
NOVOVORONEZH 2-2	(1114 MW(e), PWR, RUSSIA) on 1 May
SHIN-KORI-4	(1340 MW(e), PWR, KOREA,REP.OF) on 22 April
TAISHAN-2	(1660 MW(e), PWR, CHINA) on 23 June
YANGJIANG-6	(1000 MW(e), PWR, CHINA) on 29 June
Permanent shutdowns	
BILIBINO-1	(11 MW(e), LWGR, RUSSIA) on 14 January
CHINSHAN-2	(604 MW(e), BWR, TAIWAN,CHINA) on 16 July
GENKAI-2	(529 MW(e), PWR, JAPAN) on 9 April
PILGRIM-1	(677 MW(e), BWR, USA) on 31 May
Construction starts	
KURSK 2-2	(1115 MW(e), PWR, RUSSIA) on 15 April

www.iaea.org/pris

Screen shot from the PRIS website as of 27 August 2019

What does PRIS offer?

PRIS is a unique nuclear power data source with comprehensive information on nuclear power reactors. Its data is provided directly from officially nominated national liaison officers and data providers at nuclear power reactor sites in IAEA Member States. That makes PRIS the only comprehensive and authoritative nuclear power database in the world.

PRIS contains information on all power reactors that are in operation, under construction or in the decommissioning stage. Covering the history of nuclear power since 1954, it includes the largest collection of worldwide statistical information on operating experience and design information on nuclear power reactors.

Statistical reports available through PRIS help users understand nuclear power development and evaluate nuclear power plant performance. PRIS data can also be used for comprehensive trend analyses and benchmarking against best performers and industrial standards.

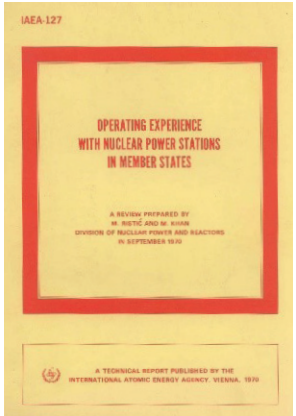
Furthermore, PRIS status and performance reports help nuclear power plants with safety performance analysis and assist the nuclear industry with analysis of global trends and strategic planning. The PRIS public website includes over 30 types of statistical reports such as reactors status reports, energy availability, unit capability, unplanned capability loss and trend reports.

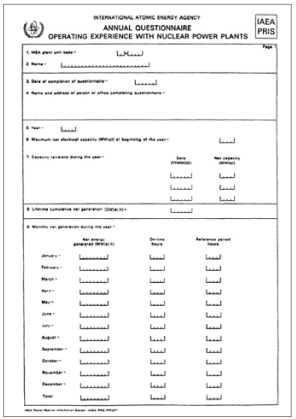
The *PRIS Statistics (PRISTA)* application, available only to registered users, provides over 80 different statistical reports, based on four levels of access rights: (1) basic, (2) non-nuclear organization, (3) nuclear industry, (4) governmental organizations and NPP owners and operators. Statistical reports and details within the reports depend on users' assigned level.

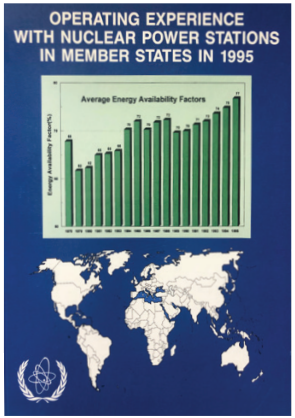
PRIS registered users have access to statistical reports and tools to generate customized reports to analyze data from all nuclear power reactor units in the world, whether they are under construction, operational or permanently shut down. The most called upon data include reactor status overview, reactor status changes, historical development of nuclear power, NPP analyses using well defined and internationally accepted performance indicators, industrial standards – quartiles, median, and average trend analyses, and reactor decommissioning process data.

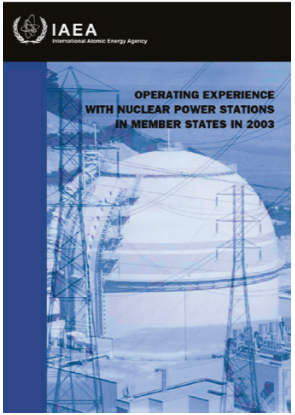
How was PRIS established?

In 1969, the IAEA issued the first questionnaire on the status of nuclear power reactors and distributed it to Member States, through officially designated national correspondents. The questionnaire collected information on 63 reactors in 14 Member States. The first edition of the IAEA publication series of annual “Operating Experience with Nuclear Power Stations in Member States” (OPEX) was published in September 1970. Since this first edition, the publication has been issued every year based on data collected annually from Member States. The 50th edition of the OPEX was published in August 2019.









What are the various PRIS products?

www.iaea.org/pris

PRIS Public Website

An essential source of information on worldwide nuclear power plant operations and statistics; the site facilitates access to annual publications, high level PRIS statistics and responses to enquiries by organizations.

WEDAS

Web Enabled Data Acquisition System (WEDAS) is a data collection system that assists PRIS data providers in IAEA Member States with an easy to use tool for online data entry, resulting in improved data quality and considerable time saving in data input into PRIS.

PRISTA

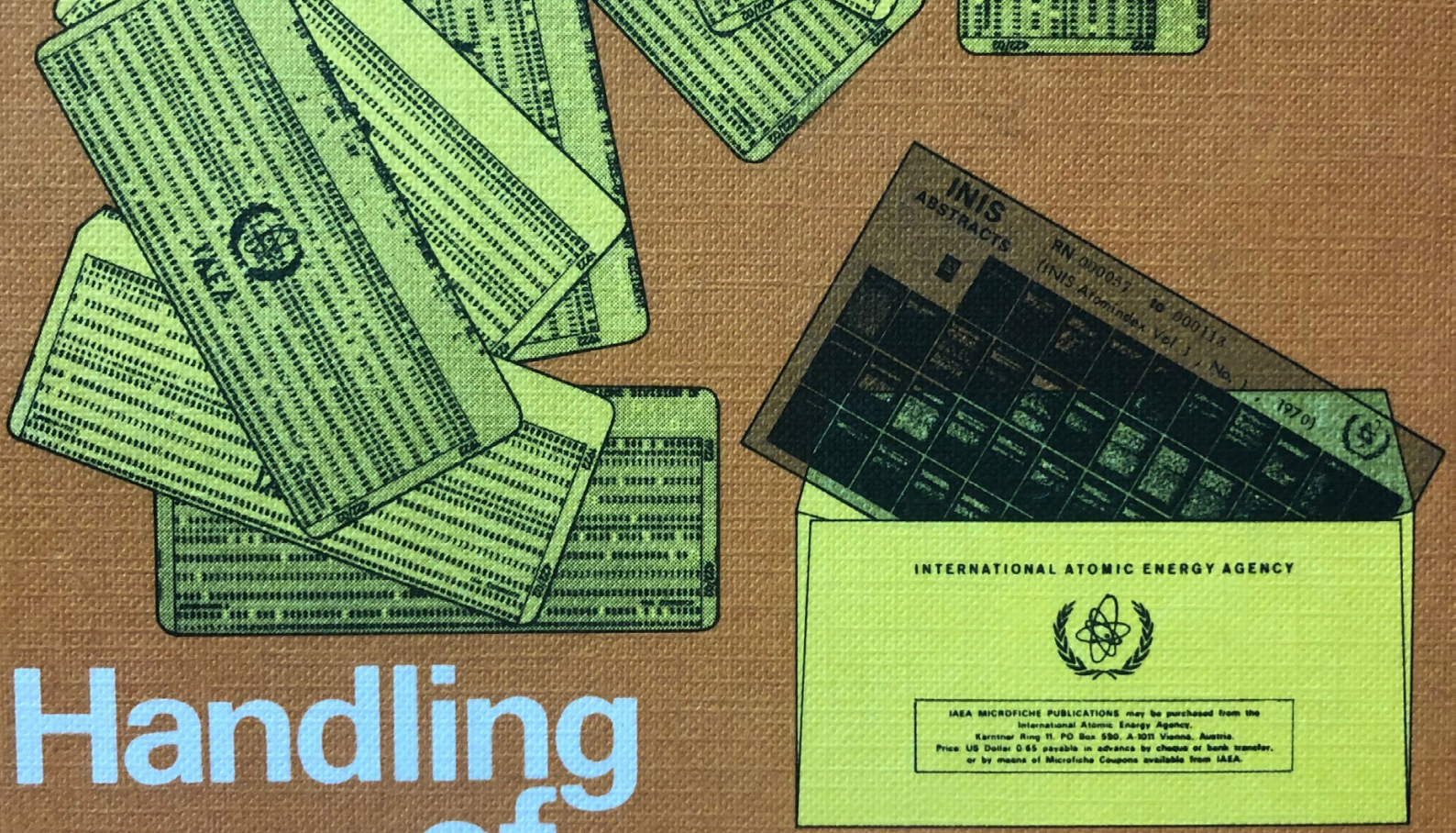
The *PRIS Statistics* online application provides tools to PRIS registered users to generate analytical reports on nuclear power development and strategies, global and plant specific reports and graphs on nuclear energy status, performance and trends.

OPEX

Operating Experience with Nuclear Power Stations in Member States is an annual publication providing comprehensive information on nuclear power reactor performance in IAEA Member States. It contains statistical information on electricity production and overall performance of individual nuclear power plants that were in operation in the reporting year. In addition to annual information, the report contains a historical summary of performance during the lifetime of individual reactors and showcases worldwide performance data of the nuclear industry.

RDS-2

Nuclear Power Reactors in the World (RDS-2) is one of the IAEA's most popular annual publications. It contains a summary of recent specification and performance data on nuclear reactors in IAEA Member States and technical data on reactors that are either planned, under construction, operational or that were shut down or decommissioned.



Handling of Nuclear Information

How has PRIS evolved?

- PRIS was initially administered by paper, where data was collected and entered by IAEA staff. In 1981, the database was computerized. The first reporting system (PRIS-PC) was recognized by the IAEA as a ground-breaking tool for nuclear data collection and validation.
- In the 1990s, data collection was arranged offline through electronic file exchange. With advances in computer software, the IAEA implemented an online data entry application, the Web Enabled Data Acquisition System (WEDAS), to assist Member States with data entry for an increasing number of reactors. Today, WEDAS is a vital part of the PRIS family of products, developed by the IAEA to manage data acquisition on nuclear power reactors worldwide.
- As of 1991, the IAEA also offered PRIS data on diskette, the MicroPRIS, in a format that standard personal computers could use.
- In 1993, PRIS launched an online function to generate statistical reports.
- By 1997, 76 data providers in 33 Member States had online access to PRIS. PRIS data were used by more than 200 organizations in over 50 Member States and 9 international organizations.
- In 2003, the first version of a web-based application for statistical outputs was incorporated into WEDAS. Since then, it has been continuously improved and extended based on Member State recommendations.
- In 2009, the new web-based PRIS Statistics (PRISTA) reporting system was developed, making PRIS reports globally available online. Global and plant specific reports and graphs are created with a few mouse clicks. A mapping system was also integrated.

PRIS has been continuously improved to meet Member States' needs. The PRIS public website is among the most visited IAEA webpages. Currently, the PRIS database includes reactor specification data at the global, Member State and reactor specific levels. PRIS also includes unit performance data such as energy production, energy loss data, outage data, and operational event information in addition to non-electrical applications.

What are PRIS milestones since inauguration?

1969

1970

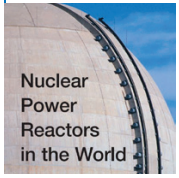
First questionnaire on the status of nuclear power reactors issued

First edition of *OPEX* published

1981

Data and reporting system computerized

Nuclear Power Reactors in the World (RDS-2) issued



1988

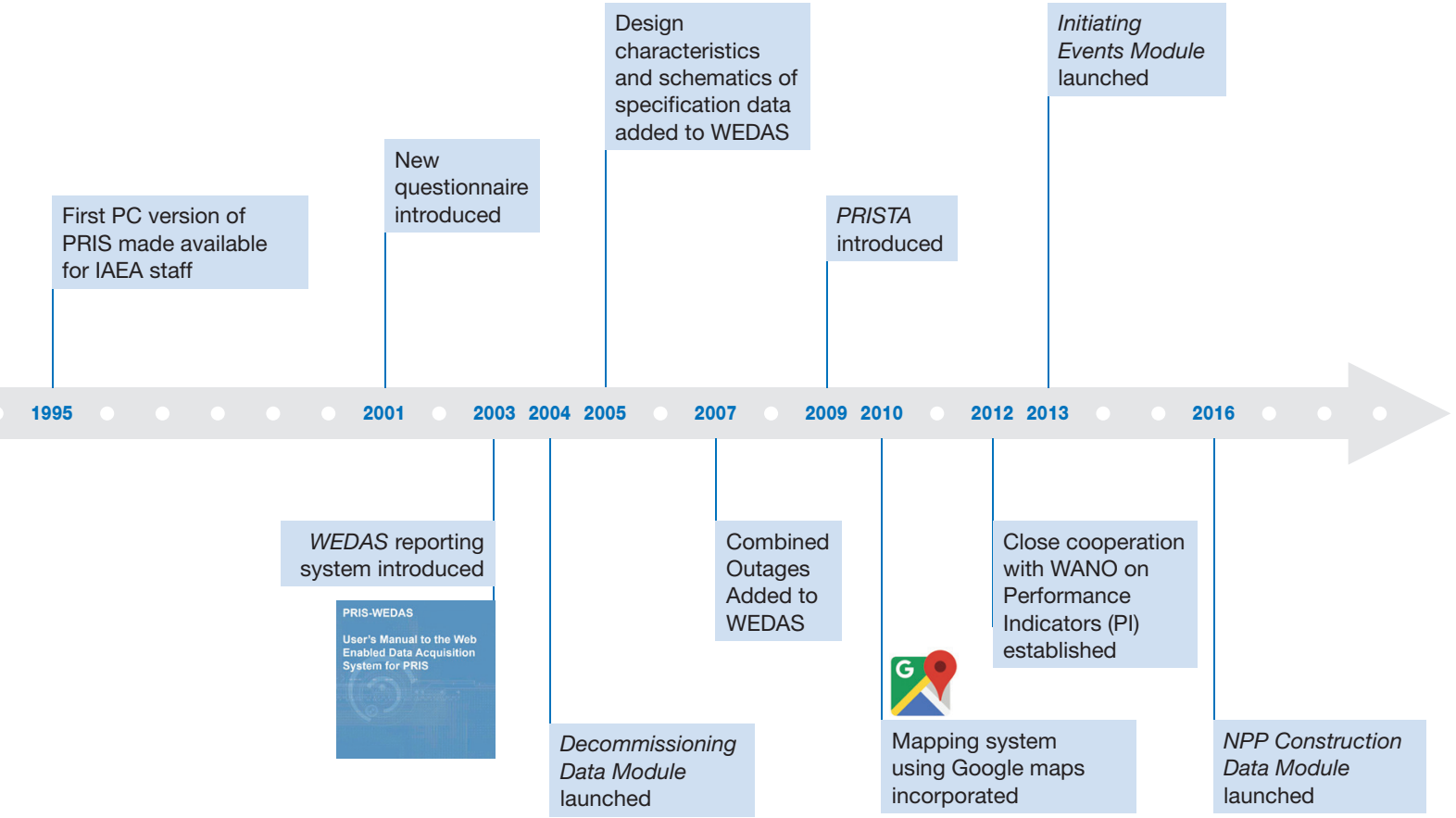
Unit Capacity Factor and *Unplanned Capability Loss Factor* implemented in PRIS

First online connection, database becomes available to a limited number of users

1991

1993

PRIS-PC: Online function to generate statistical reports introduced


First PC version of PRIS made available for IAEA staff
New questionnaire introduced
Design characteristics and schematics of specification data added to WEDAS
PRISTA introduced
Initiating Events Module launched
1995
2001
2003
2004
2005
2007
2009
2010
2012
2013
2016
WEDAS reporting system introduced
PRIS-WEDAS
User's Manual to the Web Enabled Data Acquisition System for PRIS
Decommissioning Data Module launched
Combined Outages Added to WEDAS
Mapping system using Google maps incorporated
Close cooperation with WANO on Performance Indicators (PI) established
NPP Construction Data Module launched

What's next for PRIS?

The IAEA's PRIS team works closely with national liaison officers and data providers to continuously improve PRIS based on their recommendations.

PRIS also collaborates with international nuclear organizations to continuously improve data quality and the understanding of the nuclear industry's current performance.

Upon request by Member States, the IAEA also organizes PRIS demonstrations and training sessions.

In 2019, PRIS released the first *Nuclear Power Status Map*, which draws upon PRIS data during the previous year and will be published on an annual basis.

Interest in PRIS outputs has considerably increased in recent years. The IAEA strives to further develop the PRIS database so that it may reach its full potential and fulfil Member States' needs.

The *Country Nuclear Power Profiles (CNPP)* programme is a complementary IAEA resource available to the public. It provides a comprehensive overview of energy and nuclear power development. Drawing on national contributions, *CNPP* outlines legislative, organizational, and regulatory frameworks of participating Member States, while also including statistics produced by PRIS.

Nuclear Power Status 2018

Reactors in operation

396 413 MW(e) total net capacity

2 563 TWh electricity supplied

450 Nuclear power reactors

Reactors under construction

56 643 MW(e) total net capacity

55 Nuclear power reactors

Operating experience

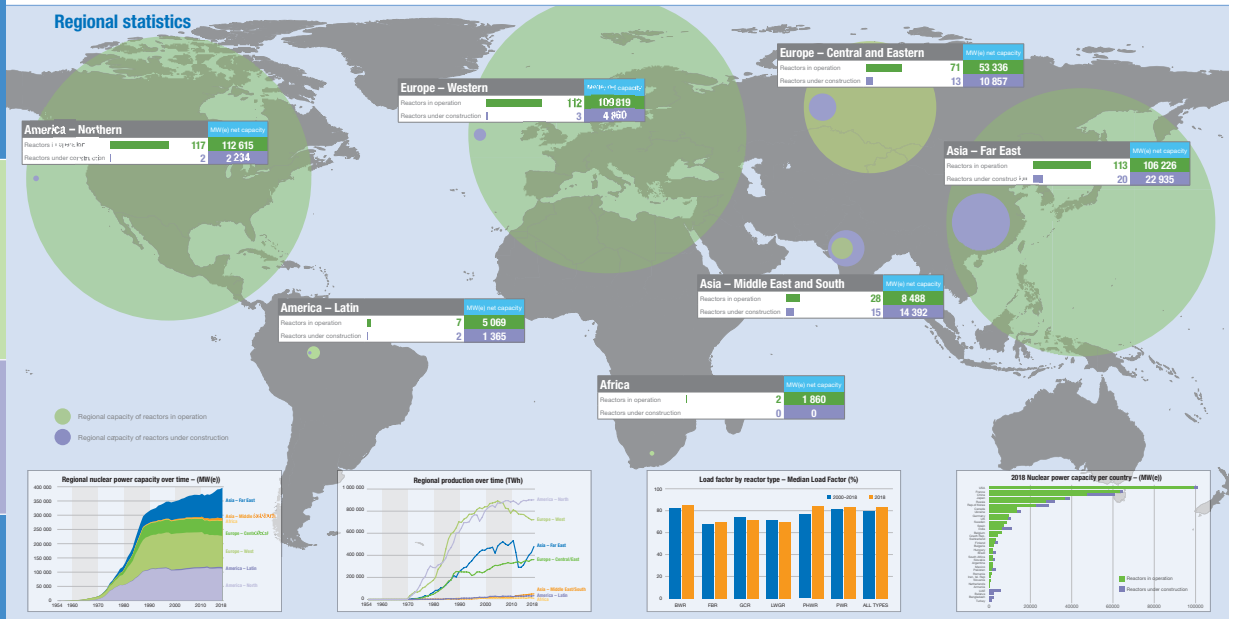
17 881 Reactor-years of operation

IAEA Power Reactor Information System PRIS

Status changes

Construction starts	AKKUYU-1	1114 MW(e), PWR, TURKEY	KURSK 2-1	1175 MW(e), PWR, RUSSIA	ROOPPUR-2	1080 MW(e), PWR, BANGLADESH	SHIN-KORI-6	1340 MW(e), PWR, REP. OF KOREA			
	HINKLEY POINT C-1	1630 MW(e), PWR, UK									
New connections to the grid	HAIYANG-1	1126 MW(e), PWR, CHINA	ROSTOV-4	950 MW(e), PWR, RUSSIA	SANMEN-2	1157 MW(e), PWR, CHINA	TIANWAN-4	1060 MW(e), PWR, CHINA			
	HAIYANG-2	1126 MW(e), PWR, CHINA	SANMEN-1	1157 MW(e), PWR, CHINA	TAISHAN-1	1660 MW(e), PWR, CHINA	YANGJIANG-5	1021 MW(e), PWR, CHINA			
	LENINGRAD 2-1	1101 MW(e), PWR, RUSSIA									
Permanent shutdowns	CHINSHAN-1	604 MW(e), BWR, TAIWAN, CHINA	LENINGRAD-1	925 MW(e), LWGR, RUSSIA	OHI-2	1120 MW(e), PWR, JAPAN	OYSTER CREEK	619 MW(e), BWR, USA			
	IKATA-2	538 MW(e), PWR, JAPAN	OHI-1	1120 MW(e), PWR, JAPAN	ONAGAWA-1	498 MW(e), BWR, JAPAN					

Regional statistics



Country statistics

Reactors in operation | Reactors under construction | Electricity supplied (TWh) | Nuclear share

Argentina	3	1	6.5	4.7%	Armenia	1	0	1.9	25.6%	Belgium	7	0	27.3	39%	Brazil	2	1	14.8	2.7%	Bulgaria	2	0	15.4	34.7%	Canada	19	0	94.4	14.9%	China	46	11	277.1	4.2%
Czech Republic	6	0	28.3	34.5%	Finland	4	1	21.9	32.4%	France	58	1	395.9	71.7%	Germany	7	0	71.9	11.7%	Hungary	4	0	14.9	50.6%	India	22	7	35.4	3.1%	Islamic Republic of Iran	1	0	6.3	2.1%
Japan	38	2	49.3	6.2%	Republic of Korea	24	5	127.1	23.7%	Mexico	2	0	13.2	5.3%	Netherlands	1	0	3.3	3.1%	Pakistan	5	2	9.3	6.8%	Romania	2	0	10.5	17.2%
Russia	36	6	191.3	17.9%	Slovakia	4	2	13.8	55%	Slovenia	1	0	5.5	35.9%	South Africa	2	0	10.6	4.7%	Spain	7	0	53.4	20.4%	Sweden	8	0	65.9	40.3%	Switzerland	5	0	24.5	37.7%
Ukraine	15	2	79.5	53%	United Kingdom	15	1	65.1	17.7%	United States	98	2	808.0	19.3%																			

Taiwan, China: 5 reactors, 4 448 MW(e) in operation; 2 reactors, 2 600 MW(e) under construction; 26.7 TWh electricity supplied, 11.4% nuclear share.

Data are as reported – 30 June 2019

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IAEA

Nuclear Energy

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Photos: CNPP, IAEA, Olkiluoto, Rosenergoatom, SouthernNuclear.

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