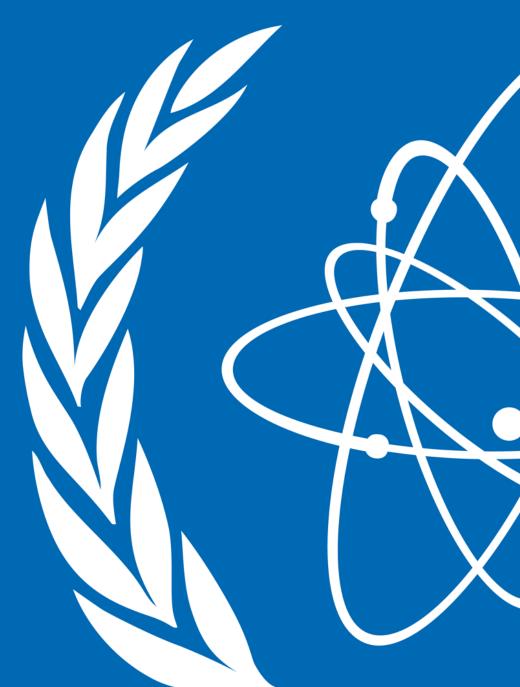
IAEA Advanced Reactor Information System (ARIS)

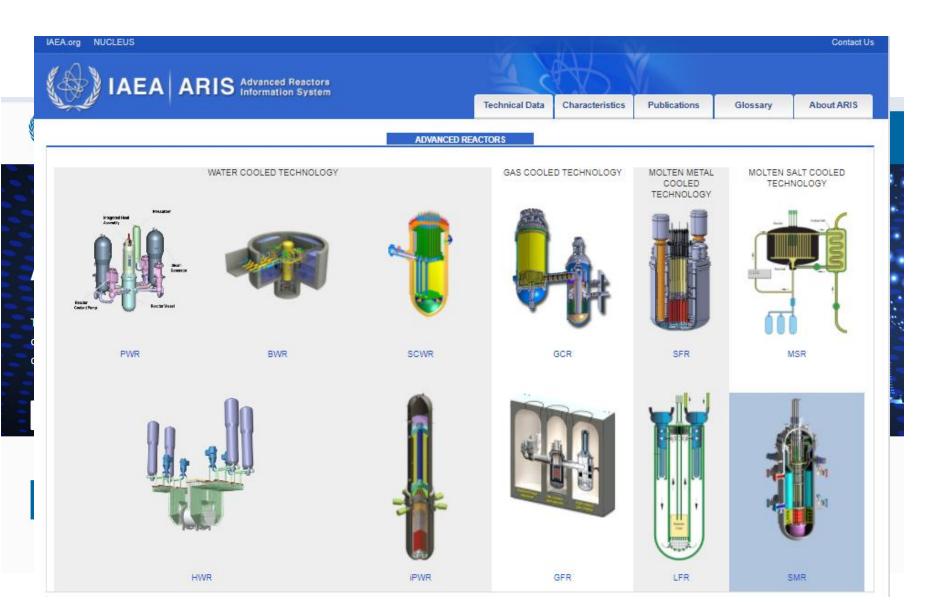
A. Miassoedov (IAEA)

Nuclear Power Technology Development Section | IAEA September 2025



ADVANCED REACTOR INFORMATION SYSTEM The Advanced Reactor Information System (ARIS) database is designed and maintained by the IAEA and contains design descriptions of evolutionary and innovative nuclear reactors

- Web-accessible database that provides Members States with balanced, comprehensive and up-to-date information about advanced nuclear plant designs and concepts
 - WCRs, GCRs, FRs, MSRs, SMRs, Microreactors
- A tool for Member States at various stages of nuclear power development, offering standardized, impartial data on reactor designs, including evolutionary and innovative concepts, to support informed reactor technology assessments



Designed and maintained by Nuclear Power Technology and Development Section (NPTDS) since 2009

The IAEA has recently launched a fully redesigned version of ARIS

Introduction - ARIS



Web accessible database and a tool for Member States at various stages of nuclear power development, offering standardized, impartial data on reactor designs, including evolutionary and innovative concepts, to support informed reactor technology assessments

Designs in ARIS

119

Design Organizations

> 75

Countries

~25



ADVANCED REACTOR INFORMATION SYSTEM The Advanced Reactor Information System (ARIS) database is designed and maintained by the IAEA and contains design descriptions of evolutionary and innovative nuclear reactors

- The technical information regarding advanced reactor designs is supplied by the relevant design organizations or reactor plant vendors, depending upon the development stage of each design
 - Nuclear steam supply system
 - Safety concepts
 - Plant performance
 - Proliferation resistance
 - Spent fuel and waste management
 - List of key technical data

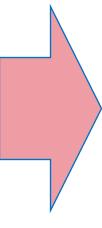
New in ARIS

Advanced

Reactors

Information

System





New user interface



Display content



Comparison of several designs



Dynamic graphs for plant data



Dashboard for vendors and admins



New reporting system

New user interface

ACP100S

Glossary

Archive

About ARIS

ACP100S

Characteristics

Publications

Technical Data

IAEA.ORG | NUCLEUS | Contact Us Login As Member Home **Technical Data** Characteristics Publications About Archive Glossary Plant / Site 119 Reactors Plant / Site Manage Columns Q Search Core Size ▼ Type ▼ Size ▼ Country -Status More Filters Search by Acronym > Reactor Unit Full name ↑ Design Org ↑ Coolant ↑ Moderator ↑ Size ↑ Design Status ↑ Country ↑ Acronym 1 Type ↑ Purpose ↑ Nuclear Steam Supply System Commercial -Toshiba Energy Systems & Solutions 45 super-safe, small and simple None SFR SMR Electric/Non-Detailed Design Japan Corp. Reactor Coolant Electric Commercial -ABV-6E ABV-6E H20 H20 PWR SMR Electric/Non-JSC "Afrikantov OKBM" Detailed Design Russian Federation Reactor Core Electric Commercial Core Materials **ABWR** Advanced Boiling Water Reactor GEH, HGNE and Toshiba H20 H20 BWR Large Electric/Non-Detailed Design Japan Electric Reactor Pressure Commercial -Advanced Boiling Water Reactor II H20 H20 Electric/Non-ABWR-II GE-Hitachi BWR Large Basic Design Japan Electric Under ACP100 ACP100 CNNC/NPIC H20 H20 **PWR** SMR Prototype/FOAK China Construction Commercial -

H20

H20

PWR

SMR

CNNC/NPIC

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Basic Design

China

Electric/Non-

Electric

New GUI

☐ ABV-6E

38

250

325



Technical Data Characteristics Glossary Publications

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16.2

N/A

Thermal Capacity Thermal Capacity Indonesia South Africa Netherlands Argentina Switzerland Denmark Czech Republic United Kingdom Poland Sweden Belgium Operating Min Thermal Capacity Max Thermal Capacity Temperature 5000 4500 Power Density United States of America 4000 Thermal Capacity [MW(th)] 3500 France 3000 Brazil Plant Efficiency 119 Reactors 2500 China 2000 Japan 1500 Discharge Burnup 1000 Canada Russian Federation India 500 NSSS Operating Others Korea, Republic of Pressure SFR GFR BWR HWR LFR PWR SCWR MSR GCR Others * This chart reflects the designs that are captured currently in ARIS Reactor Types + "Others" belong to projects funded under international organizations / consortium Containment â Volume Q Search Search by Acronym > Manage Columns Status ▼ More Filters Group By ▼ **Fuel Enrichment** 119 Reactors Refuelling Cycle Plant efficiency, Net Thermal Capacity Coolant Inlet Temperature Coolant Outlet Temperature Average Core power Density Discharge burnup NSSS Operating Pressure Primary **NSSS Operating Pre** Acronym 1 [MW(th)] ↑ [°C] ↑ [°C] ↑ [MW/m3] ↑ [%] ↑ [MWd/Kg] ↑ [MPa(abs)] ↑ [MPa(abs)] ↑ 4S 30 355 510 16.95 33.33 34 0.2 0.55

Detailed design descriptions



1. Overview

United States of America

AP 1000

me Technical Data Characteristics Publications Archive Glossary About

Summary

1.1 Introduction

1.2 Development Milestones

1.5 Design Description

1.7 Reactor Unit in PRIS

1.3 Design Organization or Vendor Company

1.6 Licensing Application Support Documents

1.4 Links to Designer/Vendor Website

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AP 1000 Overview Category Fields Parameter Fields Plant Layout, Site environment and Grid Integration Technical NSSS/Power Conversion System Design Technology Readiness Safety Concepts Fuel and Fuel Cycle Safeguard & Physical Security

> Project Delivery & Economics

In Operation	
Under Construction	
Described in	
Link to PRIS	-
□ New Concept	
Number of Units	-
Year	-
Reference Plant	
Name of Site	Sanmen Units 1 & 2; Haiyang Units 1 & 2; Vogtle Units 3 & 4 (Link to PRIS)
Net Power Output (MWe)	1100
Gross Power Output (MWe)	1200
1.1 Introduction	
The Westinghouse AP1000 plant is an 1100-MWe class PWR with passive safety features supplemented by simple, active systems to deliver multiple levels of defence, and extensive plant simplifications that enhance construction, operation, maintenance and safety. The AP1000 plant design philosophy is to achieve very high levels of safety, while applying fundamental objectives of simplification and standardization to all aspects of the plant. Other key approaches implemented in the AP1000 design include: Large margin to safety limits and reduced operator actions Reduced components to simplify operations & maintenance Optimization of supply chain and localization via specification of only "form, fit, and function" requirements High regulatory and licensing pedigree Robust load follow capability Site parameters selected to fit a wide range of sites. In addition to the reference configuration (electricity production), the AP1000 plant can also support other needs such as water desalinisation, district heating and hydrogen production. The AP1000 PWR has successfully been deployed at the Sanmen and Haiyang site in China, and at the Vogtle site in the United States, with two operating AP1000 units at each site. The operating AP1000 units outstanding early performance has an 89% average Operation Availability Factor, with five out of six units with a Lifetime Operation Availability Factor above 91.8%. Eight additional units are currently under construction in China, and the AP1000 plant technology has been selected for the Poland, Bulgaria and Ukraine.	

Published Date: Aug 09, 2024 3:20 PM CET

PublicationsARIS related documents stored on ARIS website



SMR catalogue (2024)

A supplement to the IAEA Advanced Reactor Information System (ARIS), this catalogue presents Member States with a comprehensive yet concise overview of the advances on Small Modular Reactor Technology developments in 2024 and was released for the 1st international conference on SMRs and their applications.

View >



Advanced Large Water Cooled Reactors (2020)

This Booklet offers an overview of the status of advanced, large WCRs with a capacity of 700 MWe or more. It includes descriptions of specific large light and heavy water reactors available for immediate and near-term deployment. Light water reactors are the most prevalent among the operating NPPs throughout the world, both in numbers and in total generated power. Current LWR technologies have proven to be economical, safe and reliable, and they have a mature

View >



Advances in Small Modular Reactor Technology Developments (2018)

This booklet reports current advances in the design and technology development of Small Modular Reactors through the contributions made by design organizations and vendors in the IAEA member states. All the major SMR technology lines are included and the designs are presented in sections that cover land based and marine based water-cooled reactors, high temperature gas cooled reactors, liquid metal, sodium and gas-cooled fast neutron spectrum reactors, molten salt

View >



Advances in Small Modular Reactor Technology Developments (2022)

A supplement to the IAEA Advanced Reactor Information System (ARIS), the biannual booklet presents Member States with a comprehensive yet concise overview of the advances on Small Modular Reactor Technology developments of major lines of technology. There are more than eighty (80) SMR designs under different stages of development and deployment in 18 Member States. The Akademik Lomonosov floating power unit in the Russian Federation with two-

View >



Advances in Small Modular Reactor Technology Developments (2020)

This booklet reports current advances in the technology development of Small Modular Reactors in the form of brief, yet comprehensive design descriptions contributed by design organizations and reactor vendors in the IAEA Member States. There are seventy-two (72) Small Modular and Micro-Reactor designs described in this booklet representing all the major technology lines. Major milestones have been reached in SMR technology deployment. The Akademik Lomonosov

View >



Advances in Small Modular Reactor Technology Developments (2016)

This booklet is reporting the advances in design and technology developments of Small Modular Reactors of all the major technology lines within the category of SMRs. It covers land based and marine based water-cooled reactors, high temperature gas cooled reactors, liquid metal, sodium and gas-cooled fast neutron spectrum reactors and molten salt reactors. This booklet is intended as a supplement to the IAEA Advanced Reactor Information System (ARIS)

View >



Home

Technical Data

Deployment

..........

..........

Characteristics

Publications

..........

Glossary

About

ADVANCED REACTOR INFORMATION SYSTEM

The Advanced Reactor Information System (ARIS) database is designed and maintained by the IAEA and contains design descriptions of evolutionary and innovative nuclear reactors

Explore



Advanced Reactors

Water Cooled Reactors

Gas Cooled Reactors

Fast Reactors

Molten Salt Reactors

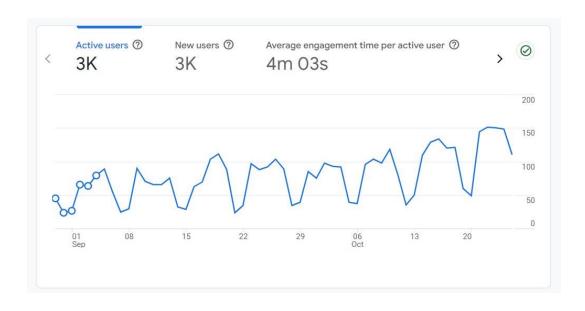
Small Modular Reactors

Microreactors

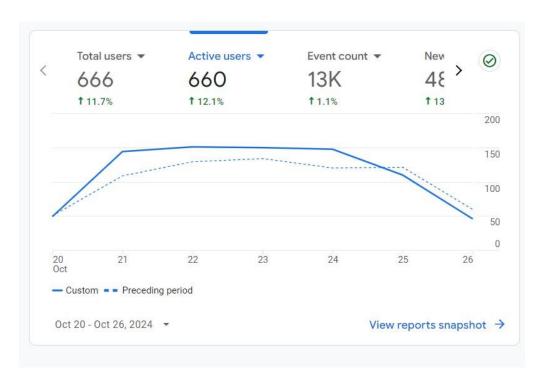
Submission and revision of reactor designs

- Interactive workflow designed for submitting new reactor designs
- Upon receiving login credentials from the IAEA, design organisations can submit new design requests and update existing design descriptions
- Design organisations:
 - Submit requests with reactor design information
 - Provide design descriptions
 - Offer updates and revisions
- IAEA
 - Review and approve request details and design descriptions
 - Publish design descriptions, making them accessible on the public website
- Webinar with interested vendors to present the new submission process (end of 2024 – beginning of 2025)

Statistics

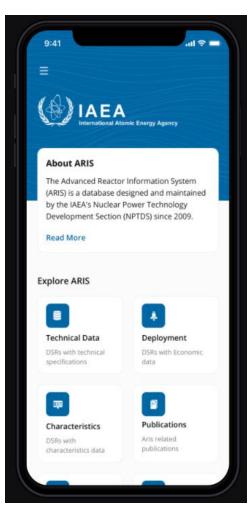


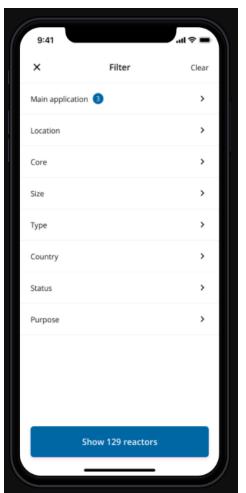
Total viewership since the launch of the ARIS database

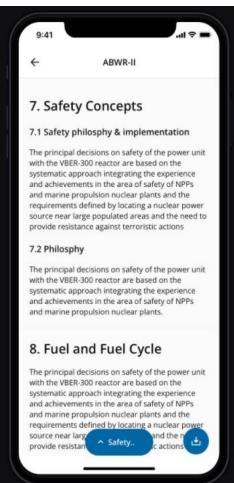


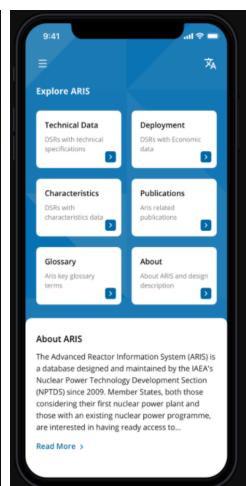
Impact of SMR conference

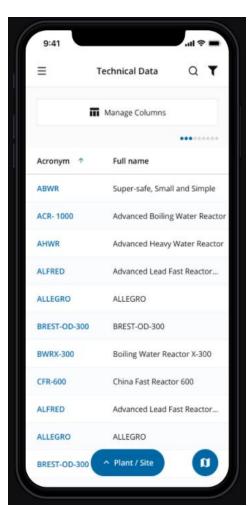
Mobile Application















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Thank you!