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International Atomic Energy Agency

Atoms for Peace and Development

A Selection of Records From the
IAEA Lise Meitner Library
Applicable to the:

**International Conference on Small
Modular Reactors and their Applications**

21 – 25 October 2024, Vienna, Austria

Library Bibliography



Resources

1

Handbook of generation IV nuclear reactors

Editor, Igor L. Piro. (2023)

Abstract

Handbook of Generation IV Nuclear Reactors, Second Edition is a fully revised and updated comprehensive resource on the latest research and advances in generation IV nuclear reactor concepts. Editor Igor Piro and his team of expert contributors have updated every chapter to reflect advances in the field since the first edition published in 2016. The book teaches the reader about available technologies, prospects and the feasibility of each concept presented, equipping them users with a strong skillset which they can apply to their own work and research.

2

Applicability of IAEA safety standards to non-water cooled reactors and small modular reactors

International Atomic Energy Agency (2023)

Abstract

This Safety Report documents the areas of novelty of these technologies in comparison with the existing fleet of reactors and provides an assessment of their impact on the applicability and completeness of the IAEA safety standards.

3

Small modular reactors: nuclear power fad or future?

Daniel T. Ingersoll (2016)

Abstract

The book is organized into three major parts with the first part focused on the role of energy, especially nuclear energy, for global development. It also provides a brief history of SMRs. The second major part presents basic nuclear power plant terminology and then discusses in depth the attributes of SMRs that distinguish them from traditional nuclear plants. The third and final major section discusses the current interest in SMRs from a customer's perspective and delineates several remaining hurdles that must be addressed to achieve wide-spread SMR deployment.

4

Small modular reactors: adding to resilience at federal facilities

US Department of Energy 2017

Abstract

This Report identifies the need for energy resilience and how an SMR can provide such a service for federal agencies. As an illustrative example, this Report focuses on the SMR project being developed by the Tennessee Valley Authority ("TVA") in Oak Ridge, Tennessee on a site adjacent to critical U.S. Department of Energy ("DOE") and National Nuclear Security Administration ("NNSA")2 facilities (referred to herein as the Oak Ridge Reservation).

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5 Small modular reactors for electricity generation: an economic and technologically sound alternative

Jorge Morales Pedraza (2017)

Abstract

As a flexible, cost-effective energy alternative to large scale nuclear power reactors, this book examines the potential future use of small modular reactors for the generation of electricity in different regions. Exploring advanced nuclear technologies, chapters describe the current situation and perspective of the small modular reactors market (SMRs) in different regions around the world, including North and South America, Europe, Asia, Middle East and Africa. Particular attention is paid to the benefits of using these types of reactors for the generation of electricity, discussing their efficiency and reduced construction time, as well as exploring the main difficulties encountered in the development stage. Looking at the potential dangers that SMRs pose to the environment and population, the text presents the new safety measures that have been adopted in SMRs design to reduce future risk.

6 The impact of small modular reactors on nuclear non-proliferation and IAEA safeguards

Nicole Virgili. Vienna Center for Disarmament and Non-Proliferation (2020)

Abstract

The paper presents an up-to-date analysis of advances in SMR designs, including European companies. The aim of the project is to evaluate challenges and opportunities presented by SMRs to the nuclear non-proliferation regime, and to compare safeguards applied to conventional reactors currently in operation and to SMRs, taking into account varying approaches to the design and licensing processes depending on the fuel used in each SMR design.

7 Small modular reactors as renewable energy sources

Bahman Zohuri. Springer International Publishing (2019)

Abstract

This book highlights Small Modular Reactors (SMRs) as a viable alternative to the Nuclear Power Plants (NPPs), which have been used as desalination plant energy sources.

8 Preconditions for the safe use of small modular reactors: outlook for the licensing system and regulatory control

Eetu Ahonen, Jussi Heinonen, Nina Lahtinen, Minna Tuomainen, Ossi Lang. STUK 2019

Abstract

This report provides an overview of small modular reactors (SMR) and certain related safety issues. The aim has been to write the report so that it provides useful information especially to those decision-makers, reporters and citizens who wish to understand what kinds of questions are involved in the development of nuclear safety, especially from the point of view of small modular reactors.

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9 Considerations for the back end of the fuel cycle of small modular reactors: proceedings of a technical meeting

International Atomic Energy Agency (2023)

Abstract

This TECDOC presents the Proceedings of the Technical Meeting on Considerations for the Back End of the Fuel Cycle of SMRs held in September 2022. This publication compiles summaries of the technical sessions, group discussions, and conclusions as well as 26 extended abstracts/full papers submitted to and presented at the meeting.

10 Autonomous nuclear power plants with artificial intelligence

Jonghyun Kim, Seungjun Lee, Poong Hyun Seong (2023)

Abstract

This book introduces novel approaches and practical examples of autonomous nuclear power plants that minimize operator intervention. Autonomous nuclear power plants with artificial intelligence presents a framework to enable nuclear power plants to autonomously operate and introduces artificial intelligence (AI) techniques to implement its functions. Although nuclear power plants are already highly automated to reduce human errors and guarantee the reliability of system operations, the term autonomous is still not popular because AI techniques are regarded as less proven technologies. However, the use of AI techniques and the autonomous operation seems unavoidable because of their great advantages, especially, in advanced reactors and small modular reactors.

11 Nuclear reactor technology development and utilization

Salah Ud-Din Khan, Alexander Nakhabov, editors (2020)

Abstract

Nuclear Reactor Technology Development and Utilization presents the theory and principles of the most common advanced nuclear reactor systems and provides a context for the value and utilization of nuclear power in a variety of applications both inside and outside a traditional nuclear setting. As countries across the globe realize their plans for a sustainable energy future, the need for innovative nuclear reactor design is increasing, and this book will provide a deep understanding of how these technologies can aid in a region's goal for clean and reliable energy. Dr Khan and Dr Nakhabov, alongside their team of expert contributors, discuss a variety of important topics, including nuclear fuel cycles, plant decommissioning and hybrid energy systems, while considering a variety of diverse uses such as nuclear desalination, hydrogen generation and radioisotope production. Knowledge acquired enables the reader to conduct further research in academia and industry, and apply the latest design, development, integration, safety and economic guidance to their work and research.



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12

Handbook of small modular nuclear reactors

Mario D. Carelli, Daniel T. Ingersoll, editors (2020)

Abstract

Handbook of Small Modular Nuclear Reactors, Second Edition is a fully updated comprehensive reference on Small Modular Reactors (SMRs), which reflects the latest research and technological advances in the field from the last five years.

13

Neutronic analysis for nuclear reactor systems

Bahman Zohuri (2019)

Abstract

This expanded new edition develops the theory of nuclear reactors from the fundamentals of fission to the operating characteristics of modern reactors. The first half of the book emphasizes reactor criticality analysis and all of the fundamentals that go into modern calculations. Simplified one group diffusion theory models are presented and extended into sophisticated multi-group transport theory models. The second half of the book deals with the two main topics of interest related to operating reactors – reactor kinetics/dynamics, and in-core fuel management. Additional chapters have been added to expand and bring the material up-to-date and include the utilization of more computer codes. Code models and detailed data sets are provided along with example problems making this a useful text for students and researchers wishing to develop an understanding of nuclear power and its implementation in today's modern energy spectrum.