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Nuclear Law - International Atomic Energy Agency 2022 This open access book traces the journey of nuclear law: its origins, how it has developed, where it is now, and where it is headed. As a discipline, this highly specialized body of law makes it possible for us to benefit from the life-saving applications of nuclear science and technology, including diagnosing cancer as well as avoiding and mitigating the effects of climate change. This book seeks to give readers a glimpse into the future of nuclear law, science and technology. It intends to provoke thought and discussion about how we can maximize the benefits and minimize the risks inherent in nuclear science and technology. This

compilation of essays presents a global view in discipline as well as in geography. The book is aimed at representatives of governments -- including regulators, policymakers and lawmakers -- as well representatives of international organizations and the legal and insurance sectors. It will be of interest to all those keen to better understand the role of law in enabling the safe, secure, and peaceful use of nuclear technology around the world. The contributions in this book are written by leading experts, including the IAEA's Director General, and discuss the four branches of nuclear law -- safety, security, safeguards and nuclear liability -- and the interaction of nuclear law with other fields of national and international law.

Contesting the Future of Nuclear Power - Benjamin K. Sovacool 2011

Paleo workouts that are heavy on results--and low on equipment investment Paleo Workouts For Dummies offers a program of back-to-the-Stone-Age exercises with specially designed workouts that burn fat, fight disease, and increase energy. The paleo workouts found in this step-by-step guide, promote sound activities with a strong emphasis on practicing and mastering fundamental/primitive human movements such as squats, hinges, pushes/pulls, sprints, crawls, and more. Paleo Workouts For Dummies caters to the anti-gym crowd who want a convenient program that can be used anywhere, anytime. In addition, vital details on healthy Paleolithic foods that maximize energy levels for the intense workout routines are covered. Companion workout videos can be accessed, for free, at Dummies.com The video content aids you in mastering paleo moves and techniques covered in the book Offers a complete cardiovascular and strength workout By focusing on the primal movements that humans evolved to perform, Paleo Workouts For Dummies is for anyone following a paleo diet routine as well as those curious about how to maximize

their paleo workouts.

Small Modular Reactors - NEA. 2016

Recent interest in small modular reactors (SMRs) is being driven by a desire to reduce the total capital costs associated with nuclear power plants and to provide power to small grid systems. According to estimates available today, if all the competitive advantages of SMRs were realised, including serial production, optimised supply chains and smaller financing costs, SMRs could be expected to have lower absolute and specific (per-kWe) construction costs than large reactors. Although the economic parameters of SMRs are not yet fully determined, a potential market exists for this technology, particularly in energy mixes with large shares of renewables. This report assesses the size of the market for SMRs that are currently being developed and that have the potential to broaden the ways of deploying nuclear power in different parts of the world. The study focuses on light water SMRs that are expected to be constructed in the coming decades and that strongly rely on serial, factory-based production of reactor modules. In a high-case scenario, up to 21 GWe of SMRs could be added globally by 2035, representing approximately 3% of total installed nuclear capacity.

Natural Circulation in Water Cooled Nuclear Power Plants - International Atomic Energy Agency 2005

Describes the state of knowledge of natural circulation in water cooled nuclear power plants and passive system reliability. The publication presents information on phenomena, models, predictive tools and experiments that currently support design and analysis of natural circulation systems, and highlights areas where additional research is needed.

Evidence - George M. Cleland 2012

The Technological and Economic Future of Nuclear Power - Reinhard Haas

2019-01-01
This open access book discusses the eroding economics of nuclear power for electricity generation as well as technical, legal, and political acceptance issues. The use of nuclear power for electricity generation is still a heavily disputed issue. Aside from technical risks, safety issues, and the unsolved problem of nuclear waste disposal, the economic performance is currently a major barrier. In recent years, the costs have skyrocketed especially in the European countries and North America. At the same time, the costs of alternatives such as photovoltaics and wind power have significantly decreased. Contents History and Current Status of the World Nuclear Industry The Dramatic Decrease of the Economics of Nuclear Power Nuclear Policy in the EU The Legacy of Csernobyl and Fukushima Nuclear Waste and Decommissioning of Nuclear Power Plants Alternatives: Heading Towards Sustainable Electricity Systems Target Groups Researchers and students in the fields of political, economic and technical sciences Energy (policy) experts, nuclear energy experts and practitioners, economists, engineers, consultants, civil society organizations The Editors Prof. Dr. Reinhard Haas is University Professor of energy economics at the Institute of Energy Systems and Electric Drives at Technische Universität Wien, Austria. PD Dr. Lutz Mez is Associate Professor at the Department for Political and Social Sciences of Freie Universität Berlin, Germany. PD Dr. Amela Ajanovic is a senior researcher and lecturer at the Institute of Energy Systems and Electrical Drives at Technische Universität Wien, Austria.--

Nuclear Power Reactor Safety - Elmer Eugene Lewis 1977

Project Management in Nuclear Power Plant Construction - International Atomic Energy Agency 2012
This publication provides guidance on project management from the

preparatory phase to plant turnover to commissioning of nuclear power plants. The guidelines and experiences described will enable project managers to obtain better performance in nuclear power plant construction.

Safety of Nuclear Power Plants - International Atomic Energy Agency 2012

On the basis of the principles included in the Fundamental Safety Principles, IAEA Safety Standards Series No. SF-1, this Safety Requirements publication establishes requirements applicable to the design of nuclear power plants. It covers the design phase and provides input for the safe operation of the power plant. It elaborates on the safety objective, safety principles and concepts that provide the basis for deriving the safety requirements that must be met for the design of a nuclear power plant. Contents: 1. Introduction; 2. Applying the safety principles and concepts; 3. Management of safety in design; 4. Principal technical requirements; 5. General plant design; 6. Design of specific plant systems.

Economic Assessment of the Long Term Operation of Nuclear Power Plants - International Atomic Energy Agency 2019-02-04

This publication describes the various approaches to the techno-economic assessment of a project for the long term operation of a nuclear power plant in its specific market environment. It examines the process of defining the technical scope required to prolong the operating licences of nuclear power plants and highlights the need for further studies on technical cost drivers and economic assessments in order to better define the cost boundaries of long term operation. Information is also provided on the new IAEA software LTOFIN, which was developed to assist in performing long term operation economic assessments within the process described in the publication.

Human Factors Engineering in the Design of Nuclear Power Plants: IAEA Safety

Standards Series No. Ssg-51 - International Atomic Energy Agency 2019-08-31
This publication provides recommendations and guidance for meeting Requirement 32 of IAEA Safety Standards Series No. SSR-2/1 (Rev. 1), Safety of Nuclear Power Plants: Design, for optimal operator performance involving systematic consideration of human factors, including the human machine interface (HMI). The Safety Guide provides a structured approach and guidance on application of human factors engineering (HFE) in the design of the HMI, which is the basis for human physical and cognitive processes in nuclear power plants. It applies to application of HFE in the design, operation and maintenance of the HMI for new plants, as well as for modifications of the HMI of existing plants.
Maintenance of Process Instrumentation in Nuclear Power Plants - H.M. Hashemian 2006-11-09
This book provides a training course for I and C maintenance engineers in power, process, chemical, and other industries. It summarizes all the scattered literature in this field. The book compiles 30 years of knowledge gained by the author and his staff in testing the I and C systems of nuclear power plants around the world. It focuses on process temperature and pressure sensors and the verification of these sensors' calibration and response time.
Heavy Component Replacement in Nuclear Power Plants - International Atomic Energy Agency 2008
Component replacement is often the most feasible solution to solve the problems associated with primary water stress corrosion cracking of Alloy 600. Even if mitigation and/or repair were a local solution, replacement offers many advantages when addressing the assortment of potentially susceptible parts contained in a major component. This publication focuses on heavy components replacement considered strategic for nuclear power plant life management but not

included in current maintenance activities carried out by utilities. The major and heavy components to be considered are: steam generators for pressurized water reactors (PWRs) and pressurized heavy water reactors (PHWRs); reactor vessel heads for PWR plants; reactor internal components for boiling water reactor (BWR) plants; reactor vessel internals for PWR plants; pressurizers for PWR plants; reactor coolant piping/recirculation piping for PWR and BWR plants, and fuel channel and feeder pipes in PHWRs.--Publisher's description.

Nuclear Hydrogen Production Handbook - Ryutaro Hino 2011

Preparation of a Feasibility Study for New Nuclear Power Projects - International Atomic Energy Agency 2014

A feasibility study represents an important step in the development of a new build nuclear power plant project. It is a complex but necessary step to determine whether a business opportunity is possible, practical and viable. Technical, economical, financial, regulatory, social, environmental aspects of a nuclear power plant programme need to be considered to allow authorities to make informed decisions regarding the possible implementation of the project This publication assists Member States in developing a feasibility study for nuclear power projects and provides guidance to users who are planning to perform such a study, with consideration of both the technical and process areas. These guidelines condense the experience of individuals involved in previous feasibility study efforts and provide industry best practices in order to maximize the usefulness of any results.

Fukushima - David Lochbaum 2015-02-10

“A gripping, suspenseful page-turner” (Kirkus Reviews) with a “fast-paced, detailed narrative that moves like a thriller” (International Business Times), Fukushima teams two leading

experts from the Union of Concerned Scientists, David Lochbaum and Edwin Lyman, with award-winning journalist Susan Q. Stranahan to give us the first definitive account of the 2011 disaster that led to the worst nuclear catastrophe since Chernobyl. Four years have passed since the day the world watched in horror as an earthquake large enough to shift the Earth's axis by several inches sent a massive tsunami toward the Japanese coast and Fukushima Daiichi nuclear power plant, causing the reactors' safety systems to fail and explosions to reduce concrete and steel buildings to rubble. Even as the consequences of the 2011 disaster continue to exact their terrible price on the people of Japan and on the world, Fukushima addresses the grim questions at the heart of the nuclear debate: could a similar catastrophe happen again, and—most important of all—how can such a crisis be averted?

Reflections on the Fukushima Daiichi Nuclear Accident - Joonhong Ahn 2016-09-27

This book focuses on nuclear engineering education in the post-Fukushima era. It was edited by the organizers of the summer school held in August 2011 in University of California, Berkeley, as part of a collaborative program between the University of Tokyo and UC Berkeley. Motivated by the particular relevance and importance of social-scientific approaches to various crucial aspects of nuclear technology, special emphasis was placed on integrating nuclear science and engineering with social science. The book consists of the lectures given in 2011 summer school and additional chapters that cover developments in the past three years since the accident. It provides an arena for discussions to find and create a renewed platform for engineering practices, and thus nuclear engineering education, which are essential in the post-Fukushima era for nurturing nuclear engineers who need to be both technically competent and trusted in society.

Nuclear Power Plant Construction Activity - 1987

Nuclear Education and Training - OECD Nuclear Energy Agency 2012

The OECD Nuclear Energy Agency (NEA) first published in 2000 Nuclear Education and Training: Cause for Concern?, which highlighted significant issues in the availability of human resources for the nuclear industry. Ten years on, Nuclear Education and Training: From Concern to Capability considers what has changed in that time and finds that, while some countries have taken positive actions, in a number of others human resources could soon be facing serious challenges in coping with existing and potential new nuclear facilities. This is exacerbated by the increasing rate of retirement as the workforce ages. This report provides a qualitative characterisation of human resource needs and appraises instruments and programmes in nuclear education and training initiated by various stakeholders in different countries. In this context, it also examines the current and future uses of nuclear research facilities for education and training purposes. Regarding the nuclear training component of workforce competence, it outlines a job taxonomy which could be a basis for addressing the needs of workers across this sector. It presents the taxonomy as a way of enhancing mutual recognition and increasing consistency of education and training for both developed and developing countries.

Maintenance of Nuclear Power Plants - International Atomic Energy Agency 1982

Please note: this publication is superseded by NS-G-2.6

NUREG/CR. - U.S. Nuclear Regulatory Commission 1980

Scientific and Technical Aerospace Reports - 1995

Lists citations with abstracts for aerospace related reports obtained from world wide sources and announces documents that have recently been entered into the NASA

Scientific and Technical Information Database.

Sensor Performance and Reliability - H. M. Hashemian 2005

New Nuclear Power Industry Procurement Markets - Ilchong Nam , Geoffrey Rothwell 2014-11-26

Ensuring safety and efficiency of the procurement market for nuclear power generation has become one of the top priorities of the policy makers in Korea since the discovery of a large number of fraudulent parts and components used by nuclear power plants. This book analyzes the nuclear power industry procurement in Korea, France, and the UK. Although all three countries restructured their electricity industry, they differ substantially in the history of the nuclear power industry, ownership and governance of firms in the industry, and relevant legal infrastructure. The findings of this book will shed light on the factors that affect safety and efficiency in the nuclear power procurement markets and the right direction for reform.

Decommissioning of Pools in Nuclear Facilities - International Atomic Energy Agency 2015

Pools or ponds are usually an integrated part of a more complex nuclear facility, but in some particular cases pools may be considered as a separate nuclear facility with a specific license. A number of nuclear installations utilize pools for the cooling of spent fuel, or the shielding of research reactor cores or irradiator sources. Over a service lifetime that can span decades, nuclear pools may become contaminated as a result of the deposition of radioactive substances. Relevant aspects of pool decommissioning covered in this publication include project planning and management, health and safety, and the management of resulting waste.

Earthquakes - Taher Zouaghi 2017-02-01

This book is devoted to diverse aspects of earthquake researches, especially to new

achievements in seismicity that involves geosciences, assessment, and mitigation. Chapters contain advanced materials of detailed engineering investigations, which can help more clearly appreciate, predict, and manage different earthquake processes. Different research themes for diverse areas in the world are developed here, highlighting new methods of studies that lead to new results and models, which could be helpful for the earthquake risk. The presented and developed themes mainly concern wave's characterization and decomposition, recent seismic activity, assessment-mitigation, and engineering techniques. The book provides the state of the art on recent progress in earthquake engineering and management. The obtained results show a scientific progress that has an international scope and, consequently, should open perspectives to other still unresolved interesting aspects.

Nuclear Power Plants: Innovative Technologies for Instrumentation and Control Systems - Yang Xu 2021

This book is a compilation of selected papers from the fifth International Symposium on Software Reliability, Industrial Safety, Cyber Security and Physical Protection of Nuclear Power Plant, held in November 2020 in Beijing, China. The purpose of this symposium is to discuss Inspection, test, certification and research for the software and hardware of Instrument and Control (I&C) systems in nuclear power plants (NPP), such as sensors, actuators and control system. It aims to provide a platform of technical exchange and experience sharing for those broad masses of experts and scholars and nuclear power practitioners, and for the combination of production, teaching and research in universities and enterprises to promote the safe development of nuclear power plant. Readers will find a wealth of valuable insights into achieving safer and more efficient instrumentation and control systems.

Guidance for the Evaluation of Innovative Nuclear Reactors and Fuel Cycles - International Atomic Energy Agency 2003

This publication reports on the International Project on Innovative Nuclear Reactors and Fuel Cycles, referred to as INPRO, which was initated by the IAEA in 2000. The main objectives of INPRO are: to help to ensure that nuclear energy is available to contribute to fulfilling energy needs in the 21st century in a sustainable manner; and to bring together both technology holders and technology users to consider jointly the international nad national actions required to achieve desired innovations in nuclear reactors and fuel cycles.

The High Performance HMI Handbook - Bill R. Hollifield 2008-01-01

The Tolerability of Risk from Nuclear Power Stations - Great Britain. Health and Safety Executive 1992

This document replaces the statement and proposals made in the discussion document Tolerability of Risk form Nuclear Power Stations published in 1988. It represents a revision of the earlier document in the light of comments received and of the discussion on the document during the Hinkley Point Inquiry and in the Inquiry report.

Power Plants - Stan Kaplan 2011-01

This is a print on demand edition of a hard to find publication. Analyzes the factors that determine the cost of electricity from new power plants. These factors -- including construction costs, fuel expense, environ. regulations, and financing costs -- can all be affected by government, energy, environmental, and economic policies. Contents: (1) Intro. and Org.; (2) Types of Generating Technologies: Electricity Demand and Power Plant Choice and Operation; Utility Scale Generating Technologies; (3) Factors that Drive Power Plant Costs; (4) Fuel Costs. Appendixes: Power Generation Technology Process Diagrams

and Images; Estimates of Power Plant Overnight Costs; Estimates of Technology Costs and Efficiency with Carbon Capture; Financial and Operating Assumptions. Charts and tables.

Workshop on Advanced Nuclear Reactor Safety Issues and Research Needs - Workshop on Advanced Nuclear Reactor Safety Issues and Research Needs 2002

New nuclear reactor designs are expected to have a higher level of safety than current designs. As part of the efforts to achieve this, important safety issues related to the new designs need to be identified at an early stage, and research required for problem resolution defined. These proceedings bring together the papers presented at the OECD/NEA Workshop on Advanced Nuclear Reactor Safety Issues and Research Needs. Conclusions of the workshop discussions are offered at the end of the book, which will be of particular interest to all those involved in planning and designing the next generat.

Milestones in the Development of a National Infrastructure for Nuclear Power - International Atomic Energy Agency 2015

The development and implementation of an appropriate infrastructure to support the successful introduction of nuclear power and its safe, secure, peaceful and sustainable application is an issue of central concern, especially for countries that are considering and planning their first nuclear power plant. In preparing the necessary nuclear infrastructure, there are several activities that need to be completed. These activities can be split into three progressive phases of development. This publication provides a description of the conditions expected to be achieved by the end of each phase to assist with the best use of resources. 'Milestones' refer to the conditions necessary to demonstrate that the phase has been successfully completed.

Nuclear Energy Outlook 2008 - OECD 2008-11-28

Using the most current data and statistics available, this Outlook provides projections up to 2050 to consider growth scenarios and potential implications on the future use of nuclear energy.

Advances in Human Error, Reliability, Resilience, and Performance - Ronald Laurids Boring 2017-06-16

This book brings together studies broadly dealing with human error from different disciplines and perspectives. They concern human performance; human variability and reliability analysis; medical, driver and pilot error, as well as automation error; reports on root cause analyses; and the cognitive modeling of human error. In addition, they highlight cutting-edge applications in safety management, defense, security, transportation, process controls, and medicine, as well as more traditional fields of application. Based on the AHFE 2017 International Conference on Human Error, Reliability, Resilience, and Performance, held on July 17–21, 2017 in Los Angeles, California, USA, the book includes experimental papers, original reviews, and reports on case studies, as well as meta-analyses, technical guidelines, best practice and methodological papers. It offers a timely reference guide for researchers and practitioners dealing with human error in a diverse range of fields. “p>

Engineering Economics and Economic Design for Process Engineers - Thane Brown 2016-04-19

Engineers often find themselves tasked with the difficult challenge of developing a design that is both technically and economically feasible. A sharply focused, how-to book, Engineering Economics and Economic Design for Process Engineers provides the tools and methods to resolve design and economic issues. It helps you integrate technical and economic decision making, creating more profit and growth for your organization. The book puts methods that are simple, fast, and inexpensive within easy reach. Author Thane Brown sets the stage by

explaining the engineer's role in the creation of economically feasible projects. He discusses the basic economics of projects — how they are funded, what kinds of investments they require, how revenues, expenses, profits, and risks are interrelated, and how cash flows into and out of a company. In the engineering economics section of the book, Brown covers topics such as present and future values, annuities, interest rates, inflation, and inflation indices. He details how to create order-of-magnitude and study grade estimates for the investments in a project and how to make study grade production cost estimates. Against this backdrop, Brown explores a unique scheme for producing an Economic Design. He demonstrates how using the Economic Design Model brings increased economic thinking and rigor into the early parts of design, the time in a project's life when its cost structure is being set and when the engineer's impact on profit is greatest. The model emphasizes three powerful new tools that help you create a comprehensive design option list. When the model is used early in a project, it can drastically lower both capital and production costs. The book's uniquely industrial focus presents topics as they would happen in a real work situation. It shows you how to combine technical and economic decision making to create economically optimum designs and increase your impact on profit and growth, and, therefore, your importance to your organization. Using these time-tested techniques, you can design processes that cost less to build and operate, and improve your company's profit.

Nuclear Reactor Technology Assessment for Near Term Deployment - International Atomic Energy Agency 2013 Given the increasing interest in the near term deployment of new nuclear power plants, IAEA Member States have requested guidance on the process of evaluating and selecting available technology options. Reactor technology assessment

enables the evaluation, selection, and deployment of the best technology to meet the objectives of a nuclear power programme. This publication demonstrates how reactor technology assessment is performed and how the process and results of this work enable decision making in nuclear power planning. The approach also provides decision makers with the documentation necessary to support their conclusions.

Design and Construction of Nuclear Power Plants - Rüdiger Meiswinkel 2013-04-10 Despite all the efforts being put into expanding renewable energy sources, large-scale power stations will be essential as part of a reliable energy supply strategy for a longer period. Given that they are low on CO2 emissions, many countries are moving into or expanding nuclear energy to cover their baseload supply. Building structures required for nuclear plants whose protective function means they are classified as safety-related, have to meet particular construction requirements more stringent than those involved in conventional construction. This book gives a comprehensive overview from approval aspects given by nuclear and construction law, with special attention to the interface between plant and construction engineering, to a building structure classification. All life cycle phases are considered, with the primary focus on execution. Accidental actions on structures, the safety concept and design and fastening systems are exposed to a particular treatment. Selected chapters from the German concrete yearbook are now being published in the new English "Beton-Kalender Series" for the benefit of an international audience. Since it was founded in 1906, the Ernst & Sohn "Beton-Kalender" has been supporting developments in reinforced and prestressed concrete. The aim was to publish a yearbook to reflect progress in "ferro-concrete" structures until - as the book's first editor, Fritz von Emperger (1862-1942), expressed it - the

"tempestuous development" in this form of construction came to an end. However, the "Beton-Kalender" quickly became the chosen work of reference for civil and structural engineers, and apart from the years 1945-1950 has been published annually ever since.