Management Of Spent Nuclear Fuel Dry Storage In Taiwan

This report aims to help policy makers develop national programmes for the future management of spent nuclear fuel and the waste generated by fuel treatment. In a concise but comprehensive way, it describes the options for spent fuel management. Nuclear Nonproliferation: The Spent Fuel Problem examines the debate concerning the storage of spent fuel generated by nuclear reactors and its implications for nuclear nonproliferation efforts. Potential barriers to the establishment or expansion of national storage facilities for spent fuel are discussed,

along with alternatives. This book covers a broad spectrum of possible multinational and international arrangements for spent fuel management, ranging from relatively benign international oversight of national facilities to arrangements for bilateral and regional cooperation, and even the creation of entirely new international institutional mechanisms. The technical, economic, political, and legal aspects of managing spent fuel are explored, paying particular attention to Eastern Europe, Western Europe, the Indian Ocean Basin, Asia, the Middle East, and Latin America. Public attitudes toward nuclear energy, especially with regard to the issue of radioactive waste disposal, are also considered. The final chapter looks at the political aspects of nuclear nonproliferation in

general and of spent fuel management in particular. This monograph will be of interest to government officials and policymakers concerned with nuclear energy and nonproliferation. Increasing awareness of the need to reduce greenhouse gas emissions has renewed interest in nuclear power generation. At the same time, the longstanding logjam over how to manage spent nuclear fuel continues to hamper the expansion of nuclear power. If nuclear power is to be a sustainable option for the United States, methods for managing spent fuel that meet stringent safety and environmental standards must be implemented. This monograph evaluates the main technical and institutional approaches to spent nuclear fuel management and

identifies implications for the development of spent fuel management policy. The authors find that on-site storage, centralized interim storage, and permanent geological disposal are generally safe, secure, and low- to moderate-cost approaches with no insurmountable technical obstacles. Advanced fuel cycles enabling spent-fuel recycling could reduce waste repository capacity needs but are difficult to evaluate because they still in early research stages. Public acceptance challenges stand as a major impediment to any technical approach. The analysis shows that the technical approaches can be combined in different ways to form different spent fuel management strategies that can be distinguished primarily in terms of societal

preferences in three areas: the disposition of spent fuel, the growth of nuclear power, and intergenerational trade-offs.
The Continuing Societal and Technical Challenges
Management of Damaged Spent Nuclear Fuel
Status of the US Department of Energy's Management of Spent Nuclear Fuel and High-Level Waste
Implementation Plan
Assumptions and Methodology Document for the Spent Nuclear Fuel Management Cost Evaluation
Nuclear Waste Management
This book lays a comprehensive foundation for addressing the issue of safety in the lifecycle of nuclear waste. With the

focus on the fundamental principles, the book covers key technical approaches to safety in the management of spent nuclear fuel, reprocessed high-level waste, low-level waste, and decommissioning wastes. Behaviors of nuclear waste in natural and engineered systems in relation to safety assessment are also described through the explanation of fundamental processes. For any country involved with the use of nuclear power, nuclear waste management is a topic of grave importance.

Although many countries have heavily invested in nuclear waste management, having a successful national program still remains a major challenge. This book offers substantial guidance for those seeking solutions to these problems. As the problem of nuclear waste management is largely influenced by social factors, the connection between technical and social issues in nuclear waste management is also discussed. The book is a core text for advanced students in nuclear and

environmental engineering, and a valuable reference for those working in nuclear engineering and related areas.

The question of how to effectively, efficiently, and responsibly manage used nuclear fuels is a concern of major impediment in the light of today's increasing usage of nuclear power and development of advanced nuclear reactors. This book focuses on two significant areas of (used) nuclear fuel: the reprocessing technology, and waste disposal and

management. The book covers the fundamental knowledge, the current state-of-the-art, and future research activities for each topic. This book provides readers with the fundamental knowledge behind of nuclear used fuel reprocessing and radioactive waste management, and their technical applications, and their requirements and practices; to make the readers aware of social, economic, and environmental concerns as well as technical research needs. The book covers two

well-known and well-developed reprocessing technologies: aqueous reprocessing technology, and electrochemical pyroprocessing. On the subject of waste management, it covers the dry storage of used nuclear fuel, novel waste form design, and nuclear waste disposal. This book is a good guide for readers who want to understand, apply, or develop the technologies. Spent fuel management encompasses all the activities associated with the handling, transport,

storage, processing and eventual disposal of spent nuclear fuel following its discharge from the reactor. The time-scale for commitment to the safe management of spent fuel is expected to be several decades, until such time as the eventual disposal arrangements have been engineered. The purpose of this document is to assist Member States to establish policies and national arrangements for spent fuel management in a structured and timely manner.

The Spent Fuel Problem

Programmatic National Spent Nuclear Fuel Management Program and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Program (ID,CA,WA,NV)
Radiological Impacts of Spent Nuclear Fuel Management Options
Hearing Before the Committee on Energy and Natural Resources, United States Senate, One Hundred Ninth Congress, Second Session, on S. 2589, to Enhance the Management and Disposal of Spent Nuclear Fuel and High-level

Radioactive Waste, to Ensure Protection of Public Health and Safety, to Ensure the Territorial Integrity and Security of the Repository at Yucca Mountain, and for Other Purposes, August 3, 2006
Nuclear Fuel Management and Disposal Act
Options for Management of Spent Nuclear Fuel and Radioactive Waste for Countries Developing New Nuclear Power Programmes
Spent nuclear fuel, the used fuel removed from nuclear reactors, is one of the most hazardous substances created by humans. Commercial spent fuel is stored at reactor

sites; about 74 percent of it is stored in pools of water, and 26 percent has been transferred to dry storage casks. The United States has no permanent disposal site for the nearly 70,000 metric tons of spent fuel currently stored in 33 states. This book examines the amount of spent fuel expected to accumulate before it can be moved from commercial nuclear reactor sites; the key risks posed by stored spent nuclear fuel and actions to help mitigate these risks; and the key benefits and challenges of moving spent nuclear fuel out of wet storage and ultimately away from

commercial nuclear reactors. On June 1, 1995, DOE issued a Record of Decision [60 Federal Register 28680] for the Department-wide management of spent nuclear fuel (SNF); regionalized storage of SNF by fuel type was selected as the preferred alternative. The proposed action evaluated in this environmental assessment is the management of SNF on the Oak Ridge Reservation (ORR) to implement this preferred alternative of regional storage. SNF would be retrieved from storage, transferred to a hot cell if segregation by fuel type and/or repackaging is

required, loaded into casks, and shipped to off-site storage. The proposed action would also include construction and operation of a dry cask SNF storage facility on ORR, in case of inadequate SNF storage. Action is needed to enable DOE to continue operation of the High Flux Isotope Reactor, which generates SNF. This report addresses environmental impacts. Congressional interest in nuclear waste is generally focused on managing commercial spent nuclear fuel (SNF), the waste produced from commercial nuclear power plants, and other high-level nuclear

wastes (HLW), largely from Cold Warâera nuclear weapons materials production. Chapter 1 examines the management of spent nuclear fuel, concerns related to the storage of nuclear waste, and the need for long-term solutions. Chapter 2 discusses a permanent geologic repository for disposal of commercial spent nuclear fuel and other high-level nuclear wastes. Chapter 3 is a draft of a bill to find a solution for the safe disposal of nuclear waste. The United States currently has no permanent disposal facility for spent nuclear fuel or other highly radioactive waste. The draft

makes critical reforms to our Nation's nuclear waste management policy. Chapter 4 reports on The Nuclear Waste Policy Act of 1982 (NWPA) which calls for disposal of spent nuclear fuel in a deep geologic repository. Chapter 5 examines the extent to which the Office of Environmental Management's (EM's) management of the Integrated Waste Treatment Unit follows selected project management best practices; challenges EM faces in disposing of the sodium-bearing waste; and challenges EM faces in treating and disposing of the calcine waste.

A Comparative Study

Management of Spent Nuclear Fuel from the K Basins at Hanford Site, Columbia River County, Richland County, Benton County

End Points for Spent Nuclear Fuel and High-Level Radioactive Waste in Russia and the United States

Management of Spent Nuclear Fuel on the Oak Ridge Reservation, Oak Ridge, Tennessee

Geological Repository Systems for Safe Disposal of Spent Nuclear Fuels and Radioactive Waste

Management, Storage and Disposal

Geological Repository Systems for Safe Disposal of Spent Nuclear

Fuels and Radioactive Waste, Second Edition, critically reviews state-of-the-art technologies and scientific methods relating to the implementation of the most effective approaches to the long-term, safe disposition of nuclear waste, also discussing regulatory developments and social engagement approaches as major themes. Chapters in Part One introduce the topic of geological disposal, providing an overview of near-surface, intermediate depth, and deep borehole disposal, spanning low-, medium- and high-level wastes. Part Two addresses the different types of repository systems – crystalline, clay, and salt,

also discussing methods of site surveying and construction. The critical safety issue of engineered barrier systems is the focus of Part Three, with coverage ranging from nuclear waste canisters, to buffer and backfill materials. Lastly, Parts Four and Five focus on safety, security, and acceptability, concentrating on repository performance assessment, then radiation protection, environmental monitoring, and social engagement. Comprehensively revised, updated, and expanded with 25% new material on topics of current importance, this is the standard reference for all nuclear waste management and geological

repository professionals and researchers. Contains 25% more material on topics of current importance in this new, comprehensive edition Fully updated coverage of both near-surface/intermediate depth, and deep borehole disposal in one convenient volume Goes beyond the scientific and technical aspects of disposal to include the political, regulatory, and societal issues involved, all from an international perspective

Given current energy projections, it is likely that interest in nuclear energy will grow, resulting in more fuel passing through the back end of the fuel cycle. To minimise the

time, risk and resources associated with management of this spent nuclear fuel, it is important to minimise the amount and handling of damaged spent fuel. Arising from an IAEA meeting on this topic, this publication provides assistance in determining if fuel with a particular type of defect is acceptable or if it requires non-standard handling. The publication is intended to facilitate evaluation of the costs and benefits of design concepts or design changes for storage or transport systems, and to help in selecting appropriate methods for identifying and handling damaged spent nuclear fuel.

Focused attention by world leaders is needed to address the substantial challenges posed by disposal of spent nuclear fuel from reactors and high-level radioactive waste from processing such fuel. The biggest challenges in achieving safe and secure storage and permanent waste disposal are societal, although technical challenges remain. Disposition of radioactive wastes in a deep geological repository is a sound approach as long as it progresses through a stepwise decision-making process that takes advantage of technical advances, public participation, and international cooperation. Written for concerned citizens as well as

policymakers, this book was sponsored by the U.S. Department of Energy, U.S. Nuclear Regulatory Commission, and waste management organizations in eight other countries.

Nuclear Fuel Management and Disposal Act : hearing

Managing Spent Nuclear Fuel

Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs Draft Environmental Impact Statement. Volume 1, Appendix B: Idaho National Engineering

Laboratory Spent Nuclear Fuel Management Program

A Comparative Overview of Approaches to Management of Spent Nuclear Fuel and High Level Wastes in Different Countries

Integrating Management of Spent Nuclear Fuel from Generation to Disposal in the United States

End Points for spent Nuclear Fuel and High-Level Radioactive Waste in Russian and the United States provides an analysis of the management of spent nuclear fuel and high-level radioactive waste in Russia and the United States, describing inventories, comparing approaches, and assessing the end-point options for storage and disposal of materials and wastes. The authoring committee finds that despite differences in philosophy about nuclear

fuel cycles, Russia and the United States need similar kinds of facilities and face similar challenges, although in Russia many of the problems are worse and funding is less available. This book contains recommendations for immediate and near-term actions, for example, protecting and stabilizing materials that are security and safety hazards, actions for the longer term, such as developing more interim storage capacity and studying effects of deep injection, and areas for collaboration.

This work has been selected by scholars as being culturally important, and is part of the knowledge base of civilization as we know it. This work was reproduced from the original artifact, and remains as true to the original work as possible. Therefore, you will see the original copyright references, library stamps (as most of these works have been housed in

our most important libraries around the world), and other notations in the work. This work is in the public domain in the United States of America, and possibly other nations. Within the United States, you may freely copy and distribute this work, as no entity (individual or corporate) has a copyright on the body of the work.As a reproduction of a historical artifact, this work may contain missing or blurred pages, poor pictures, errant marks, etc. Scholars believe, and we concur, that this work is important enough to be preserved, reproduced, and made generally available to the public. We appreciate your support of the preservation process, and thank you for being an important part of keeping this knowledge alive and relevant.

A comparative study of the radiological impacts of two main fuel cycle options: one with and one without reprocessing of

spent nuclear fuel.

Science, Technology, and Policy

Nuclear Fuel Reprocessing and Waste Management

Spent Nuclear Fuel in the U. S.

An International Two Day Conference ; Conference Documentation

Implementation Plan: Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington.

Environmental Impact Statement

Treatment and Management of Sodium-bonded Spent Nuclear Fuel

The US Department of Energy (DOE) has prepared this report to assist its management in making two decisions. The first decision, which is programmatic, is to determine the management

program for DOE spent nuclear fuel. The second decision is on the future direction of environmental restoration, waste management, and spent nuclear fuel management activities at the Idaho National Engineering Laboratory. Volume 1 of the EIS, which supports the programmatic decision, considers the effects of spent nuclear fuel management on the quality of the human and natural environment for planning years 1995 through 2035. DOE has derived the information and analysis

results in Volume 1 from several site-specific appendixes. Volume 2 of the EIS, which supports the INEL-specific decision, describes environmental impacts for various environmental restoration, waste management, and spent nuclear fuel management alternatives for planning years 1995 through 2005. This Appendix B to Volume 1 considers the impacts on the INEL environment of the implementation of various DOE-wide spent nuclear fuel management alternatives. The Naval

Nuclear Propulsion Program, which is a joint Navy/DOE program, is responsible for spent naval nuclear fuel examination at the INEL. For this appendix, naval fuel that has been examined at the Naval Reactors Facility and turned over to DOE for storage is termed naval-type fuel. This appendix evaluates the management of DOE spent nuclear fuel including naval-type fuel. Collection of documents pertaining to the preparation of the document titled:

Management of spent nuclear fuel from the K Basins at the Hanford Site, Richland, Washington : draft environmental impact statement.
The nuclear fuel cycle is characterised by the wide range of scientific disciplines and technologies it employs. The development of ever more integrated processes across the many stages of the nuclear fuel cycle therefore confronts plant manufacturers and operators with formidable challenges. Nuclear fuel cycle science and

engineering describes both the key features of the complete nuclear fuel cycle and the wealth of recent research in this important field. Part one provides an introduction to the nuclear fuel cycle. Radiological protection, security and public acceptance of nuclear technology are considered, along with the economics of nuclear power. Part two goes on to explore materials mining, enrichment, fuel element design and fabrication for the uranium and thorium nuclear fuel cycle. The

impact of nuclear reactor design and operation on fuel element irradiation is the focus of part three, including water and gas-cooled reactors, along with CANDU and Generation IV designs. Finally, part four reviews spent nuclear fuel and radioactive waste management. With its distinguished editor and international team of expert contributors, Nuclear fuel cycle science and engineering provides an important review for all those involved in the design, fabrication, use and disposal of nuclear

fuels as well as regulatory bodies and researchers in this field. Provides a comprehensive and holistic review of the complete nuclear fuel cycle Reviews the issues presented by the nuclear fuel cycle, including radiological protection and security, public acceptance and economic analysis Discusses issues at the front-end of the fuel cycle, including uranium and thorium mining, enrichment and fuel design and fabrication

Health and Safety Impacts

Related to the Management of Spent Nuclear Fuels
Nuclear Fuel Cycle Science and Engineering
Record of Decision
Legal implications of the management of spent nuclear fuel and radioactive waste
Nuclear Nonproliferation
Data Package to Support the Preparation of an Environmental Assessment

The production of nuclear materials for the national defense was an intense, nationwide effort that began with the Manhattan Project and continued throughout the Cold War. Now many of these product materials, by-products, and precursors, such as irradiated nuclear fuels and targets, have been

declared as excess by the Department of Energy (DOE). Most of this excess inventory has been, or will be, turned over to DOE's Office of Environmental Management (EM), which is responsible for cleaning up the former production sites. Recognizing the scientific and technical challenges facing EM, Congress in 1995 established the EM Science Program (EMSP) to develop and fund directed, long-term research that could substantially enhance the knowledge base available for new cleanup technologies and decision making. The EMSP has previously asked the National Academies' National Research Council for advice for developing research agendas in subsurface contamination, facility deactivation and decommissioning, high-level waste, and mixed and transuranic waste. For this study the committee was

tasked to provide recommendations for a research agenda to improve the scientific basis for DOE's management of its high-cost, high-volume, or high-risk excess nuclear materials and spent nuclear fuels. To address its task, the committee focused its attention on DOE's excess plutonium-239, spent nuclear fuels, cesium-137 and strontium-90 capsules, depleted uranium, and higher actinide isotopes.
End Points for Spent Nuclear Fuel and High-Level Radioactive Waste in Russia and the United StatesNational Academies Press
"DOE is responsible for disposing ofcommercial spent nuclear fuel. DOEentered into contracts with owners andgenerators of spent nuclear fuel tobegin disposing of it beginning in 1998,with plans for disposal in a nationalrepository. DOE, however, was

unableto meet the 1998 date and, as a resultof lawsuits, the federal government haspaid out about $3.7 billion for storagecosts. DOE proposed a new strategy inJanuary 2013 to build consolidatedinterim storage facilities-startingoperations in 2021 and 2025.GAO was asked to review issuesrelated to DOE's strategy for managingspent nuclear fuel. This report (1)describes the expected rate of spentnuclear fuel accumulation in wet anddry storage, (2) identifies the basis offederal liability for spent nuclear fuelmanagement to date and of DOE'sestimate of future liabilities, and (3)assesses challenges, if any, thatexperts and stakeholders haveidentified to the federal government'sability to meet DOE's time frames formanaging spent nuclear fuel atconsolidated interim storage

facilitiesand potential ways for DOE to mitigatethe challenges. GAO revieweddocuments from DOE and otheragencies, and interviewed experts andstakeholders from industry, federal andstate governments, interest groups,and independent entities."

Options, Experience and Trends in Spent Nuclear Fuel Management

Management of Spent Nuclear Fuel from the K Basins at the Hanford Site, Richland, Washington

Disposition of High-Level Waste and Spent Nuclear Fuel

Report to Congressional Requesters

Environmental Impact Statement Department of Energy Programmatic Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs

Under the Nuclear Waste Policy

Act of 1982, as amended, the U.S. Department of Energy is responsible for managing the disposal of spent nuclear fuel from civilian nuclear power plants. Deployment of a multipurpose canister (MPC) system for dry storage of commercial spent nuclear fuel at reactor sites was determined to be an option for managing spent nuclear fuel until either a permanent repository or interim central storage facility (commonly called a Monitored Retrievable Storage Facility, or MRS) becomes available. Routine health and safety impacts to workers from handling and storage

operations at nuclear facilities for four separate scenarios were evaluated for the MPC system: an on-time repository with an MRS; an on-time repository with no MRS; a delayed repository with an MRS; and a delayed repository with no MRS. In addition to evaluating the MPC system, five alternatives were analyzed. These included the No Action Alternative (NAA), Current Technology (CTr), the Transposable Storage Cask (TSC), the Dual-Purpose Canister (DPC), and the Small MPC (SmMPC). Health effects are expressed as collective doses in person- rem per year and risks as

latent cancer fatalities per year for incident-free operations for each alternative and scenario. Results show that both dose and risks to workers vary as much as 68% among scenarios and alternatives. Although dose estimates and risks fall below limits for radiation dose to workers as specified in Title 10, Part 20, of the Code of Federal Regulations, additional measures could be applied to reduce potential doses and resultant health risk. 5 refs., 2 tabs.

Environmental Data and Analyses for the Proposed Management of Spent Nuclear Fuel on the DOE Oak Ridge Reservation

To Enhance the Management and Disposal of Spent Nuclear Fuel and High-Level Radioactive Waste, to Ensure Protection of Public Health and Safety, to Ensure the Territorial Integrity and Security of the Repository at Yucca Mountain, and for Other Purposes. -

Management of Spent Nuclear Fuel and Its Waste

Improving the Scientific Basis for Managing DOE's Excess Nuclear Materials and Spent Nuclear Fuel

Strategy Alternatives and Policy Implications

The Nuclear Fuel Cycle