Part I: NES publications under preparation*

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1. Grid Reliability and Stability for Nuclear Power Plant Operations
2. Valorisation of NORM Residues in Line with the Circular Economy Principles
3. Good Practices and Lessons Learned from Long Term of Operation of Nuclear Power Plants
4. Management of Category 1-2 Disused Sealed Radioactive Sources. Approaches and practical experiences
5. Conditioning of Category 3-5 Disused Sealed Radioactive Sources. Approaches and practical experiences
6. Establishing and Managing a Radioactive Waste Management Organization with Responsibility for Repository Development
7. Contracting and Partnering in Decommissioning and Environmental Remediation
8. Lifecycle Management and Sustainability for Environmental Remediation
9. Handbook on Conditioning of Low- and Intermediate-Level Liquid, Solidified and Solid Waste
10. Instrumentation and control and advanced digital technologies for the support of plant performance optimization
11. Development considerations and life cycle management approaches for nuclear facility I&C systems
12. Handbook on the Storage of Radioactive Waste
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16. Preparation of a Feasibility Study for New Nuclear Power Projects (Rev.1)
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18. Design Control in Nuclear Power Plants and Projects: a Structured Process for the Development, Review and Approval of Design and Design Modifications
19. Strengthening Organizational Resilience in the Nuclear Organization
20. Guidance for Preparing Generic User Requirements and Criteria Documents for Small Modular Reactors and their Applications
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27. Optimization of Research Reactor Availability and Reliability: Recommended Practices
28. Stakeholder Engagement in a New Nuclear Power Programme
29. Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes (Rev. 1)
30. The use of Controls for Contaminated Land Management
31. Leadership in Nuclear Organizations

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** Manuscripts approved in their final form and awaiting production

32. Synergies in Technology Development between Nuclear Fission and Fusion for Energy Production
33. Evaluation of a Management System for Nuclear Facilities
34. Nuclear Hydrogen Business Case – Evaluation of Factors for Deployment
35. Local Stakeholder Involvement in Nuclear Programmes
36. International Safeguards in the Design of Facilities for Radioactive Waste Management
37. Methodology for Nuclear Energy Cost Analysis
38. Costs Assessment Methodologies for the Back End of the Fuel Cycle
39. Financing NPP in the Liberalised Market (Reference Report)
40. Existing and Advanced Nuclear Fuel Cycle Technical Options for Waste Burden Minimization
41. Development of waste acceptance criteria for low and intermediate level waste
42. Industrial Involvement to Support a National Nuclear Power Programme (Rev.1)
43. Guidelines for an Ageing Management, Modernization and Refurbishment Programme for a Research Reactor
44. Nuclear Power Plant Project Engineering
45. Industrial Involvement to Support a National Nuclear Power Programme

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Part II: NES publications in final form**

46. Policy and Strategy for NORM Residue and Waste Management
47. Vendor and User Responsibilities in Nuclear Cogeneration Projects
48. Cost-Benefit Analysis (CBA) of New Nuclear Power Projects
49. Decontamination Methodologies and Approaches
50. Determination of Environmental Remediation End States
51. Enhancing National Safeguards Infrastructure to Support the Introduction of Nuclear Power
52. Evaluation, Management and Remediation of Trenches containing Historic Radioactive Wastes: Legacy Trench Sites
53. Experience in the Management of Radioactive Wastes After Nuclear Accidents: A Basis for Pre-Planning
54. Fatigue Assessment in Light Water Reactors for Long Term Operation: Good Practices and Lessons Learned
55. Global Status of Decommissioning of Nuclear Facilities
56. Guide to Knowledge Management Strategies and Approaches in Nuclear Organizations
57. Guidelines for Conducting Strategic Environmental Assessment for a Nuclear Power Programme
58. Integrated Life Cycle Risk Management for New Nuclear Power Plants
59. Introduction to Systems Engineering for the Instrumentation and Control of Nuclear Facilities
60. Knowledge Organization System for VVER Water-Cooled Water-Moderated Power Reactors
61. Knowledge Management and its Implementation in Nuclear Organizations
62. Management of ageing and obsolescence of nuclear I&C systems and equipment through modernization
63. Management of Disused Devices Containing Depleted Uranium (DU) Used for Radiation Shielding
64. Management of Disused Ionization Chamber Smoke Detectors and their Associated Disused Sealed Radioactive Sources
65. Managing Human Resources in the Field of Nuclear Energy (Rev. 1)
66. Methodology for Assessing Pipe Failure Rates in Advanced Water Cooled Reactors – Final Report of a Coordinated Research Project
67. Milestones in the Development of National Infrastructure for the Uranium Production Cycle
68. Nuclear-Renewable Hybrid Energy Systems
69. Organization and Technical Options for Radioactive Waste Minimization during Operation and Maintenance of Nuclear Facilities
70. Post Irradiation Examination (PIE) for Research Reactor Fuels
71. Project Management in Construction of Research Reactors
72. Technical Approaches for the Management of Separated Civilian Plutonium
73. Terms for Describing Advanced Nuclear Power Plants
74. Transition Management from Operation to Decommissioning in Nuclear Power Plants

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Additional information for NES publications under preparation (as listed in Part I)

Title	Information

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1. Grid Reliability and Stability for Nuclear Power Plant Operations	The objective of this NES is to review the needs, challenges and solutions in Member States on key areas of interfacing and operating electric grid systems and NPPs and will address the grid-NPP reliability and stability elements for the Member States. The guidance will deal, in particular, with establishing, maintaining and sustaining a reliable grid in support of safe and efficient operation of NPPs. The topics to be covered in this document will consist of specific information on the experience, benefits, risks, difficulties and challenges involved in grid reliability for safe and efficient operation of NPPs. Proposed Content (based on the exploratory content by experts): • Technical aspects of equipment and design for grid to improve reliability; • Integrated work among stakeholders building and maintaining NPP-Grid interface; • Interface around the step-up transformer and on-site distribution for reliability of sending/receiving off-site power; • Methods for estimating off-site power reliability for input to the safety evaluations; • Reliability improvement against hazards (natural and man-made); • Operation of a reliable grid with nuclear generation being an important share; • Grid structure evaluation and reliability requirements for connecting the first NPP; • Newcomer, expanding and established Member State operational experience for grid reliability including upgrade, maintenance and planning of grid to support nuclear generation in the energy mix.
2. Valorisation of NORM Residues in Line with the Circular Economy Principles	This practical publication, aimed particularly to help implementers, complements the other reports produced in the context of the Environet NORM project and will provide an overview and inventory of case studies, success stories and pitfalls and lessons learned concerning of the international state-of-the-art residue and waste valorisation technologies relevant to NORM. It will also offer different stakeholders such as industry, regulators and policy makers, and academia with the evidence-based tools and good practices conducting multi criteria analysis of the sustainable recovery, re-use, and recycling of NORM, including social and environmental management and monitoring plans. Finally, it is envisioned that the publication will contribute to enhance the capabilities of MS in reaching and maintaining consensus among both relevant stakeholders about risks and benefits of NORM residues and waste valorisation options within the circular economy transition. This publication will examine the valorisation of NORM residues associated with the following industrial operations: extraction of rare earth elements; production and use of thorium and its compounds; production of niobium and ferroniobium; mining of ores (other than uranium ore); the zircon and zirconia industries; manufacture of titanium dioxide pigment; the fertilizer (phosphate) industry; production of iron and steel, tin, copper, aluminium, zinc and lead; combustion of coal; production of oil and gas; water treatment. Radioactive wastes generated by operations related to the nuclear fuel cycle will not be dealt with by this publication that will not cover either operation of any type involving artificial radionuclides.

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3. Good Practices and Lessons Learned from Long Term of Operation of Nuclear Power Plants	The objective is to assist Member States which are planning LTO, and those are preparing for the second LTO period. The goal of the document is to provide the good practices and operating experience from LTO. The topics to be covered in the document will consists of the good practices and operating experience in the following areas: • Modernization and refurbishment in NPPs for LTO. • Application of new AMPs and extension of existing AMPs during LTO. • Major Challenges for LTO Process o Material degradation challenges o Licensing and technical support challenges • Continued or new research needs. • Preparation for the next license renewal.
4. Management of Category 1-2 Disused Sealed Radioactive Sources. Approaches and practical experiences	The document is expected to provide MSs with relevant information and practical experiences on how Category 1-2 disused sealed radioactive sources are properly managed. Taking account of the international experiences, the publication aims to identify the latest developments, technical options and key activities to be taken to ensure that disused sealed radioactive sources are safely and securely managed. The report will cover a wide range of aspects of the life cycle of Category 1-2 sealed radioactive sources, including manufacturing, applications, management options, national strategy for the disused sources, etc. This document will take into consideration the content of the IAEA Code of Conduct on the Safety and Security of Radioactive Sources, which describes how States can safely and securely manage category 1-2 sealed radioactive sources. The report is in line with the IAEA supplementary Guidance on the Management of Disused Radioactive Sources, which advises States on the available management options for disused sealed radioactive sources.
5. Conditioning of Category 3-5 Disused Sealed Radioactive Sources. Approaches and practical experiences	This publication is intended to present information on experiences with and lessons learned from the conditioning of DSRS. Based on this information, the publication will provide the administrative, management and technical guidance for conditioning of DSRS, including the dismantlement of nuclear gauge and devices. This publication will provide the necessary information for regulators and operators in Member States to thoroughly assess and implement the conditioning operations for the safe and secure storage and/or disposal of DSRS. This publication will cover all technical and organizational aspects related to effectively implement the conditioning of DSRS. These operations should be part of the national overall DSRS management strategy in all Member States. The publication will summarize on various completed and ongoing international experiences on the conditioning operations for DSRS. Lessons learned from both good and bad practices will also be addressed.

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6. Establishing and Managing a Radioactive Waste Management Organization with Responsibility for Repository Development	The objective of the document is to advise on practical aspects of a repository development project, in particular on how to prepare, plan, launch, perform and manage it. Technical activities shall be performed taking into account the possible mutual interactions between cross-linked tasks and relevant interfaces among project components. It is intended to describe managerial processes rather than to specify detailed technical solutions. In this frame, the document should cover both near-surface and geological disposal programmes, with their varying duration, technical focus and intensity of site characterization and assessment, but highlighting similar decision-making processes, methodologies, public interaction, information/data management and sequencing of main activities. The document will be introduced by the consideration of prerequisites before starting a repository development project, followed by the overview of component's specifications, their relationships, and indicative sequence of key activities/stages. Based on experience from countries with advanced programmes, it will further include stepwise description of appropriate planning, managing, organizing, staffing and implementing repository development process that will be illustrated by country cases.

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	This document will cover all technical and organizational aspects related with the decommissioning of industrial and research gamma irradiators and the management of the associated radioactive sources including decontamination operations associated with leaking sources. Radiotherapy equipment (Teletherapy, brachytherapy), industrial radiography equipment, nuclear logging equipment and industrial gauges are out of the scope of this document, because their dismantling requirements are comparatively simpler. Information will be provided on the various types of gamma irradiators in use at industrial facilities, or research centers, and how their design and construction features affect decommissioning. Practical guidance will be given on decommissioning strategies and technologies for the removal/recovery and management of the high activity sources. Reports on various gamma irradiators decommissioning projects that have been completed will be summarized. Lessons learned from both good and bad practices will be discussed. This report will address, among others, the following major issues: • Research and industrial gamma irradiators, types, number, construction and operational features • Estimated life and reasons for shutdown of gamma irradiators • Types and features of gamma irradiators and their influence on decommissioning • Radiological characterization of irradiators • Decontamination/dismantling strategies and their occupational / environmental impact • Removal and Management (handling, conditioning, packaging, transport, storage and disposal) of the high activity sources during and after decommissioning. Experiences • Organizational and managerial aspects of decommissioning (including costs) • Project description, experience and issues (Annex) • Case histories (Annex)

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7. Contracting and Partnering in Decommissioning and Environmental Remediation	This publication is aimed at making available practical guidance regarding safe, timely and cost-effective participation of contractors and partners in a decommissioning or environmental remediation project. The proposed task includes a study of experiences and lessons learned related to the role of and potential issues with contractors and partners in different cultures and working environments. This report will address, among others, the following major issues: - O&M during active phases of decommissioning or environmental remediation - O&M for the post-decommissioning or post-remediation phase of site reuse/redevelopment - Organization of the decommissioning or environmental remediation workforce, including roles, responsibilities, reporting lines, qualifications and training - In-house vs. contractors' approach - Management of contracted services (forms of contracts, administration, milestones, closure, payments etc.) - Interactions contractor - plant staff - Management of information - Partners and their involvement - National project description (Annex) - Case histories (Annex)
8. Lifecycle Management and Sustainability for Environmental Remediation	The objective of the document to be produced is to show how life-cycle assessment approach can be used to direct the development of technical activities according to environmental considerations with emphasis on the environmental remediation stage of the project. With this document Member States will have more elements to design their operations in other to maximize the environmental performance as to choose options that make sense if the whole Life-Cycle perspective of the operations is taken into account. In a very brief way, the scope of the document will cover in an integrated manner the production, processing, waste treatment and disposal, rehabilitation and aftercare stages are integrated. As it can be seen the scope of the document goes far beyond than simple waste management planning and remediation from the very start of a project.

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9. Handbook on Conditioning of Low- and Intermediate-Level Liquid, Solidified and Solid Waste	The handbook is expected to provide end-users in Member States with necessary knowledge and information to understand and effectively implement technologies for conditioning of low and intermediate level liquid, solidified and solid waste. This document will integrate safety and technical information on conditioning of low and intermediate level liquid, solidified and solid waste. The new publication will supersede the outdated IAEA technical documents, published in period from 1970 to 2007 into one consistent handbook on the subject matter for designers, operators and regulators.
10. Instrumentation and control and advanced digital technologies for the support of plant performance optimization	The objective of the publication is to assist Member States in the judicious use of advanced I&C and digital technologies, so that existing and new NPPs are operated at their best possible performance level, and those costs of operation are minimized while ensuring high levels of safety and security and also to provide an overview on the current knowledge, up to date best practices, experiences, benefits and challenges related to the subject approaches (listed under "Scope") on the role of I&C and advanced digital systems in supporting the improvement and optimization of plant performance.
11. Development considerations and life cycle management approaches for nuclear facility I&C systems	The objective is to assist Member States in raising awareness and a greater understanding of the approaches that can be adopted for life cycle management as applied to I&C system design and development. The life cycle management needs to be applicable to all I&C systems at a nuclear facility, including the overall engineering life cycle of I&C systems important to safety as described in IAEA SSG-39. The aim of the publication is to provide an overview on the current knowledge, up to date best practices, experiences, benefits and challenges related to the subject approaches (listed under "Scope") on I&C systems life cycle management. This includes the coordination of life cycle management methods applied to I&C systems and those applicable to any safety systems that they might interconnect or otherwise interface with. The report is intended to be used by Member States to ensure that appropriate considerations are made to support the introduction of life cycle management approaches for all relevant stakeholders involved in the development of I&C for nuclear facilities and to discuss how these activities can support their safe, reliable and long-term operation.

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12. Handbook on the Storage of Radioactive Waste	The storage of radioactive waste is an integral part of waste management from raw waste to fully conditioned waste packages ready for final disposition. The purpose of a storage facility or structure is to safely and securely contain the packaged radioactive waste in an organized and retrievable fashion for a defined period of time, while ensuring that the radiation protection of workers, the public and the environment are properly addressed according to applicable regulations. IAEA publications regarding technical, managerial and safety-related aspects of radioactive waste storage were published between 1972 and 2006 and cover this topic to varying degrees. Whilst useful information is available in different publications, this information can be organized into a single publication to facilitate easier use for specific needs of the Member States. Thus, a Handbook is developed to update, consolidate and integrate in a coherent information provided in current IAEA publications with current operational, safety and technical information on approaches and technologies for storage of radioactive waste and conditioned waste packages. The primary objective of this document is to provide state-of-the-art guidance to Member States on the storage of radioactive waste and conditioned waste packages in storage facilities. It aims to align technical information with safety assessment and operational needs, to provide operating experience and lessons learned and to have an adequate basis for development of training material required for technology transfer to less-developed Member States. The information contained in the existing published Agency documents in this area will be consolidated, updated and organized in line with the proposed new Handbook structure. Consideration is given to waste storage in both initial unconditioned form (including liquid/sludge form) as well as disposal-ready conditioned waste packages awaiting final disposal. As such, this publication will: (1) Summarize the lessons learned from the storage of radioactive waste in the past; (2) Succinctly state the technical requirements and conditions for selecting, designing and safely operating storage facilities for different types of waste; (3) Succinctly state the technical requirements and conditions for selecting, designing, specifying and using waste packages and waste forms for different types of waste; (4) Provide examples of various types of waste packages and storage facilities and their related technical and operating parameters; (5) Identify any other related technical considerations.

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13. Handbook on the Treatment of Solid LILW Radioactive Waste	Low and intermediate level solid wastes are generated from nuclear power reactors, front and back-end fuel cycle facilities and nuclear applications. Over the years, a wealth of information has been accumulated on the principles and practices of the safe and efficient treatment of such wastes. Much of this information is now available in the public domain in the form of Agency publications. There are around 16 such publications dealing with various facets of solid waste treatment. Some of these are 20 and 40 years old, and others address specific aspects such as hospital wastes, graphite wastes or small waste producers. Whilst all this information is useful to the end-users in Member States, it is also recognized that there is room for improvement in the way the information is organized and presented so that it becomes easier to use for specific needs, plus updating is required to cover recent developments in this field. Such improvement is envisaged to be brought about by consolidating, updating and organizing the information in a structured way. This handbook will provide state of the art technical guidance to designers, operators and regulators in Member States in the area of treatment of low and intermediate level solid waste. This work is part of a comprehensive effort to consolidate, update and reorganize technical information for publication as NE Series Technical Reports in the various areas of predisposal radioactive waste management. The present Handbook is one of a series of such publications. The main objective of the document is to provide a comprehensive state-of-the-art source of relevant and practical information for assessing potential options for the treatment of low and intermediate level solid waste, and to facilitate the identification and safe, cost-effective implementation of an optimum treatment strategy for such wastes. The information contained in the existing published Agency documents in this area will be consolidated, updated and organized in line with the proposed new Handbook structure. The document will cover the treatment (volume reduction, stabilization, and change of form) of all types of low and intermediate level solid waste from power reactors, fuel cycle facilities and nuclear applications, including research institutions, medical usage, industrial use etc., including wet sludges and spent ion exchange resins. Some ‘specialist’ waste treatments such as alkali metal treatment, graphite wastes treatment will not be directly covered as suitable focused technical reports are already available. The report will be structured in two parts: Part I will provide a technical overview of applicable treatment technologies and approaches, and considerations for their application. Part II will comprise of Annexes which describe each of the technologies/approaches in detail, including mode of operation, design and operational aspects.

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14. Handbook on The Treatment of LILW Liquid LILW Radioactive Waste	Low and intermediate level liquid wastes are generated from nuclear power reactors, front and back end fuel cycle facilities and nuclear applications. Over the years, a wealth of information has been accumulated on the principles and practices for the safe and efficient treatment of such wastes. Much of this information is now available in the public domain in the form of Agency publications. There are many publications dealing with various facets of liquid waste treatment. Whilst all this information is useful to the end-users in Member States, it is also recognized that there is room for improvement in the way the information is organized and presented so that it becomes easier to use for specific needs, plus updating is required to cover recent developments in this field. Such improvement is envisaged to be brought about by consolidating, updating and organizing the information in a structured way. This Handbook will provide state of the art technical guidance to designers, operators and regulators in Member States in the area of treatment of low and intermediate level liquid waste. This work is part of a comprehensive effort to consolidate, update and reorganize technical information for publication as NE Series Technical Reports in the various areas of predisposal radioactive waste management. The present Handbook is one of a series of such publications. The main objective of the document is to provide a comprehensive state-of-the-art source of relevant and practical information for assessing options for the treatment of low and intermediate level liquid waste, and to facilitate the identification and safe, cost-effective implementation of an optimum treatment strategy for such wastes. The information contained in the existing published Agency documents in this area will be consolidated, updated and organized in line with the proposed new Handbook structure. The document will cover the treatment of all types of low and intermediate level liquid waste from power reactors, fuel cycle facilities and nuclear applications, including research institutions, medical usage, industrial use etc., including wet sludges and spent ion exchange resins. The report will be structured in two parts: Part I will provide a technical overview of applicable treatment technologies and approaches, and considerations for their application. Part II will comprise of Annexes which describe each of the technologies/approaches in detail, including mode of operation, design and operational aspects. This structure is based on the generic structure of the Handbook series. Part I will cover the following areas: — Overview of requirements for treatment of L&IL liquid wastes; — Waste inventory requirements for treatment of L&IL liquid waste; — Overview of applicable treatment technologies; — Technology selection considerations; — Implementation of preferred strategy — Conclusions and recommendations

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	Part II will include Annexes that will provide detailed information for each of the treatment technologies discussed in Part I. This information will include technology deployment configurations, system design and operational considerations. Note – only Part I of the document is planned to be published in print. Part II of this report will be available in electronic form only, i.e. on CD which will be included with the print version of Part I.

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15. Quality and Reliability Aspects in Nuclear Power Reactor Fuel Engineering (Rev.1)	The main objective of the publication is to provide guidance and best practices to improve fuel reliability and performance in water-cooled reactors. This publication will cover: • Design (e.g. simulation tools, design methodologies, safety limits, design process…), • Fabrication (e.g. QA process, fuel vendor surveillance, …), • Operation (e.g. monitoring of defected fuel, surveillance of the key parameters, water chemistry monitoring, fuel assembly distortion, sustainable power manoeuvring, pool side inspections, …), • Handling (e.g. distorted fuel assemblies for reuse, debris, transport to the reactor, loading into the reactor, discharge from the reactor…), • Spent fuel storage (e.g. no failure in "at reactor" spent fuel pool, testing for gamma radiation activity, pool-side inspection, PIE strategies, …).
16. Preparation of a Feasibility Study for New Nuclear Power Projects (Rev.1)	This publication is intended to update the previous IAEA publication "Preparation of a Feasibility Study for New Nuclear Power Projects (IAEA NG-T-3.3, 2014)" by aligning the activities with the current milestones approach, by reflecting the pre-feasibility study scope versus the feasibility study scope and by recent experiences from Member States. The review will also address the technical content of the described activities to reflect the actual experience and knowledge. The objective of the revised publication is to facilitate an understanding of the necessary activities to be performed during a feasibility study in the context of the Milestones approach for the introduction of a nuclear programme. The discussions are intended to be in context with the nuclear infrastructure development approach described in NG-G-3.1, 'Milestones in the Development of a National Infrastructure for Nuclear Power.' Rev 1. This revised publication will describe the responsibilities and activities related to the feasibility study by all stakeholders involved in the nuclear programme. This publication will define the objectives and scope of the pre-feasibility study performed in phase 1 and of the feasibility study in phase 2 and explain the key managerial and strategic elements of the latter. It will describe the various steps generally undertaken to prepare a feasibility study in relation to the prerequisites of a nuclear project. It will provide an effective guideline in support of prospective organizations of countries that are embarking on their first nuclear power project. Roles of stakeholders in the preparation of a feasibility study for the introduction of a nuclear project will be discussed. This publication will review the existing document for consistency with current experience from newcomers, and with technical developments in the areas covered by the feasibility study since the publication of the document in 2014. The publication is intended to support the countries in considering and applying suitable options for accelerated clean energy deployment.

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17. Milestones in the Development of a National Infrastructure for Nuclear Power (Rev. 2)	The main objectives of the revision are to: • incorporate the recent experience of advanced embarking countries, in particular those with advanced projects (Phase 3 countries) or that have already started operation (recent experiences of UAE and Belarus which started operation of the first units in 2020) • incorporate, when appropriate, considerations to programmes with SMRs instead of large nuclear power reactors. A Technical Meeting held in 2020 on this particular issue, concluded that the 19 issues of the Milestones approach apply as well to programmes based on SMRs; however some aspects of the infrastructure could be implemented or considered differently. Among others, this is the case of the issues related to financing, regulatory framework, emergency planning, siting, and industrial involvement. • refer, in more detail, to the potential use of non-electric applications, such as district heating and desalination, and their potential implication. These topics are already listed in the Milestones approach, but more considerations could be included. The scope of the document will be, to a large extent, maintained as it will not be impacted by the proposed considerations: This publication covers both the 'hard' infrastructure (i.e. electrical grid and sites, etc.) and 'soft' infrastructure (i.e. nuclear law, regulations, training, etc.) needed for a nuclear power programme. Infrastructure needs are discussed from the time a country first considers the nuclear power option, through decision making, planning, procurement, construction and preparations for commissioning. Subsequent steps — operation, decommissioning, spent fuel and radioactive waste management — are addressed only to the degree necessary for planning purposes prior to commissioning and operation. They are included because all stages, including operation and decommissioning, as well as spent fuel and radioactive waste management, should be considered when the decision is made to proceed with nuclear power and because planning for these stages should be in progress by the time specifications for the plant are set. By the time the country is ready to commission and operate a nuclear power plant, it should be ready to manage the longer-term commitments associated with operation, spent fuel and radioactive waste management, and decommissioning.

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18. Design Control in Nuclear Power Plants and Projects: a Structured Process for the Development, Review and Approval of Design and Design Modifications	This publication will aim to provide a generic implementation level guidance, based on the experience and current knowledge, for design control, i.e. for developing, establishing, implementing, assessing, and continually improving a structured preparation, review, acceptance, approval and modification of NPP project and plant designs and associated responsibilities, including the cases of new NPP designs, changes to the existing NPP designs and redesign of NPPs. It will address relevant aspects of performing effective design (and the modifications to it) development, review and approval in support of decision making on nuclear project/plant safety and performance by providing a common understanding of the design activities and their implementation throughout the NPP lifecycle. It may also serve as a roadmap towards capacity building in countries embarking on nuclear power programmes by describing forthcoming design development acceptance, control and maintenance activities and associated skills. The publication intends to disseminate the observations gained, the lessons learned and the conclusions drawn from good practices for defining and maintaining fundamental elements, roles, responsibilities and interfacing requirements for NPP owner/operating organizations and nuclear power plant/project entities concerning the acceptance and utilisation of initial facility design (and the changes to it thereafter). As such, it provides a set of descriptive and practiced processes that integrate safety, performance and economical aspects to achieve safe, reliable, and efficient nuclear electricity and energy generation with an emphasis on strengthening the design decision making capabilities supported by adequate and timely maintenance and control of the NPP design. This publication will describe the specific design process stages, elements and associated design control activities and roles that are applied throughout NPP lifecycle by the decision makers of a NPP or a NPP project. In order to provide guidance for a structured and rigorous design control process, this publication will develop an understanding of fundamental and specific definitions, phases and techniques, interfaces and assessment methods of the design control process towards design decision making capabilities on the NPP design at various stages of its lifetime to maintain the design integrity. The scope will not include the design control process during the development of a technology (e.g. design of a generic/standard reactor design) that is performed by the technology owners, i.e. nuclear steam supply system (NSSS) vendors/responsible designers. However, the publication will discuss necessary actions by the purchaser of the technology to ensure that the technology owner/designer has an established and appropriate design control and assurance processes.

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19. Strengthening Organizational Resilience in the Nuclear Organization	This publication is intended to offer guidance on how to elicit and strengthen resilient performance at the individual, group, and institutional levels to optimize nuclear safety, security, and performance and create institutional strength in depth. This document will cover the following content: - Cognitive and behavioural agility - Adaptive capacity - Decision-making, both risk-based and naturalistic (e.g., emergent) - Navigating in complex and complicated environments - Risk analysis and success path formation.

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20. Guidance for Preparing Generic User Requirements and Criteria Documents for Small Modular Reactors and their Applications	To serve as a guidance document that provides a framework to cover any near-term deployable SMR designs, basing on identify identified specific requirements and criteria associated with the need of SMR technologies for various energy market niches, by considering key technology attributes of SMRs and Member States' specific needs and conditions, with feedbacks from Member States by conducting exchange of information, sharing experience and expertise, and discussions on the development of guidance on preparing generic user requirements and top-tier criteria for small modular reactor technology for near term deployment. The scope of Guidance for Preparing Generic User Requirements and Criteria Documents for Small Modular Reactors and their Applications herein is for developing a comprehensive statement which reflects key policy of a Member State on the expectations of its user/owner/operator on SMR technology. This publication places emphasis on the standing points of users/owners/operators who drive the demand and requirements for the reactor designs. It also provides a basis for designers/developers to offer a licensed SMR product that addresses/incorporates specific needs of embarking countries, and for strong investor confidence that risks associated with the initial investment to complete and operate the first SMR can be minimized. The publication is divided into three parts: **Part I** is to establish the background, objective, scope and structure of the guidance for preparing GURC documents for SMR and their applications. **Part II** is to introduce GURC and to provide a generic structure and main contents that need to be addressed for the GURC document. The generic structure includes national nuclear energy programme, national scenario of energy for electricity and other applications, overall safety performance objectives, technical considerations, general plant performance, economic requirements, deployment scenario, infrastructure development, considerations on deployment models, safeguards, proliferation resistance, security, and microreactors options. **Part III** is to summarise and give a set of recommendations. The Appendix A shows the status of SMRs for near-term deployment. The Appendix B lists the IAEA's Safety Standards for readers' reference. The Annex provides an example of GURC Document respectively of an embarking country and of an expanding country, only on the aspect of top-tier requirements.
21. Status and Trends in Spent Fuel and Radioactive Waste Management	The report should provide an analysis of the current status and forward trends in spent fuel and radioactive waste management, and include information on current inventories, expected future arisings and estimation of facilities for the long-term management of these materials. The report is intended to serve as a comprehensive and authoritative reference on the world-wide situation, compatible with the information provided for the reports provided under the Joint Convention and EC Directive. The information provided in this publication is based primarily on the data submitted by each of the participating Member States to Spent Fuel and Radioactive Waste Information System and data presented in the reports to the Seventh Review Meeting of the Contracting Parties to the Joint Convention (meeting will be held June-July

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	2022, with all relevant data as at Dec 2019). It includes an analysis of national arrangements and programmes for spent fuel and radioactive waste management. International achievements and challenges are also addressed. The first Status and Trends in Spent Fuel and Radioactive Waste Management was published by the IAEA in January 2018 with the reference date 31st December 2013. The second one in January 2022 with the reference date 31st December 2016. The intent is to publish new report every 3 years, in line with the reporting schedule for the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.
22. Considerations for closure of near surface repositories	The objective of the publication is to summarize information on approaches to ensuring adequate closure of near surface disposal facilities, specifically in consideration of the period of institutional control common to these types of facilities. To this end the publication will examine current best practices based on facilities which have been designed and licensed by IAEA Member States in developing sufficiently passive closure systems, which provide for minimal maintenance or intervention needs throughout the period of institutional control. The document will further capture best practices and considerations for designing and monitoring cover systems; planning and preparedness for potential incidents, which may occur that could affect the capping systems performance during the closure period; consideration of future land usage; financial planning responsibilities for closure over the period of institutional control; and records retention aspects related to closure of near surface repositories. The publication will incorporate case studies in way of examples and lessons learned upon which the discussion and conclusions will be based. This publication focuses on near surface disposal facilities and discusses mainly technical and some socio-economic issues that need to be considered in the planning and implementation of repository closure. It will present examples from licensed facilities in Member States on both operational, technical and social- economic aspects of repository closure. The scope will be limited to radioactive waste management aspects of near surface disposal of low level waste (LLW). The document will not discuss aspects of radioactive waste disposal specific to the disposal of Intermediate Level Waste (ILW), High Level Waste (HLW) and/or spent nuclear fuel (SNF) when classified as waste.
23. Roadmap for the Commercial Deployment of Nuclear Hydrogen Production	The publication will provide a useful management tool for evaluating, planning and strategizing the development of nuclear hydrogen projects by interested Member States, taking into account the TRL and time to market of different technologies. The publication will cover the current status of development and deployment of different nuclear hydrogen production projects and technology roadmaps, as well as prospects, impediments, markets, competitive landscape, deployment indicators and stakeholders. The publication will also address integration—in the context of hydrogen

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	production from NPPs in operation today—and the main infrastructure issues related to the production, distribution, storage and use of hydrogen.

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24. Model Curriculum on Strategic Planning for Sustainable Nuclear Energy Development	This publication is intended to provide a model curriculum for a master's degree course covering topics related to the strategic planning for sustainable nuclear energy development. The publication can be used and or adopted by university curriculum developers as well as faculty and instructors from academic and other educational institutions, including centres of excellence and vocational education, that are implementing or considering educational programmes on the long-term planning for sustainable nuclear energy development. The objectives of such a course of study is to update students on the current status of electricity generation in the world with emphasis on pros and cons of all possible industrial energy sources non-renewable including nuclear power as well as renewable, provide independent overview of current status and future developments in nuclear-power industry of the world including advanced large power-reactors, SMR concepts, and Generation-IV reactor concepts, and corresponding to that nuclear power plants of today and of tomorrow and deliver assessment capabilities of the INPRO methodologies, which can be applied to all reactors and nuclear power plants. They will learn about the context of these approaches, why they were developed and how they can be useful to Member States and key organizations in Member States to reach informed decisions on nuclear. The course is structured to provide sufficient breadth and depth so that students can utilize the inform on INPRO but provide the context and guidance so they can explore INPRO methodologies in more detail. It will be a basis for them to ultimately become specialists and even subject matter experts for roles they may have in their careers. The course aims to support capacity building and national human resource development in the nuclear energy sector and intended for Master level students of Nuclear Science, Nuclear Technology and Nuclear Engineering. This publication offers a framework for a master's degree course in strategic planning for sustainable nuclear energy development. Prerequisite for the proposed course is a bachelor's degree in nuclear sciences or engineering. It is recommended that the course be included in the master programme, when a basic or intermediate level of nuclear knowledge has been acquired. At this point the student should be able to comprehend the value of managing this knowledge as asset. More specifically the prerequisites are discussed for each module of the syllabus. The scope of this publication covers the following topics: - Planning and energy strategies for sustainable development. - Planning for nuclear energy sustainability. - Innovations in nuclear energy sector in meeting sustainable energy development challenges. - IAEA INPRO methodology and tools for sustainability assessment of nuclear energy system. - Methods and tools for planning sustainable energy development.

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	- Methods and tools for modelling and analysis of nuclear energy systems. - Practical application of tools for planning and assessment of energy systems.

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25. Roadmap for Implementing a Geological Disposal Programme	The document is expected to provide MSs with a good understanding of how geological disposal solutions are developed by identifying the key phases and activities that contribute to the development of a geological disposal facility as the disposal programme evolves from an early research and development phase to later phases such as construction, operation, and closure. The role of URLs in the development of the disposal programme will be described. The report will try to be as complete as possible by providing an envelope of activities that can be included in a geological disposal program. This does not mean that all activities need to be included, and some Member States will see that certain items are not relevant to their national programme. It, however, seems useful to develop a roadmap that is as complete and widely applicable as possible. The report will cover a wide range of aspects of the disposal programme such as the strategy and policy the regulatory framework and licenses, science and engineering, financing, stakeholder engagement, safeguards and security, etc. This information will be arranged in the form of a matrix comprising rows and columns, where the rows are key activities and the columns are the phases or milestones in the disposal development timeline. Disposal development requires a solid and robust technical and scientific basis. This basis is built by RD&D providing the data and information for: 1. characterising the natural environment, understanding of its features, events and processes likely to provide for and impact on safety 2. engineering the disposal system, understanding of its features, events and processes likely to provide for and impact on safety 3. the safety assessment (and possibly environmental impact assessment) of the disposal system As part of this overall, generic guidance on how to develop a geological disposal programme, some specific activities may be analysed in more detail, in particular the requirements involved as well as the specific role and contribution of these activities to different phases of implementation of the disposal programme. One such example is the research, development and demonstration work conducted in underground research laboratories. Another is the iterative development of disposal system performance assessment. As yet another example we may cite the development and maintenance of a disposal system requirements management tool. The report will take under advisement the developments in the report “Costing methods and financing schemes for radioactive waste disposal programmes” that is currently being developed. As a disposal programme contains a whole range of activities and can become very extensive, assessing its cost can only be done once all the activities or items that need to be done in a disposal programme are identified. That is where a Work Breakdown Structure (WBS) of a disposal programme can be useful as it lists the activities and items of a disposal programme and structures them in a logical way. This WBS evidently needs to be consistent with the roadmap

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26. Preparing a Request for Information on Nuclear Power Reactors	The objective is to give member states a clear guide to structure their RFI and conduct the process flawlesslyso that they can better understand what the vendors can offer and how it fits their needs. The guidance should go beyond listing criteria and focus instead on the process itself, drawing on the experience of Member States which actually conducted an RFI in the last few years. The objective is to allow Members States to gather useful information, applicable to their countries and helpful in implementing their nuclear power programmes, with the aim to enter negotiation at the end of Phase 2 of the Milestone Approach. This publication places emphasis on the standing points of users/owners/operators who drive the demand as well as on the requirements for the reactor designs and support services (operation, maintenance, training, fuel supply, etc.). It also provides the Member States with a basis for getting relevant information from technology providers, which allows them to further define their nuclear power programme, considering what is available on the market.
27. Optimization of Research Reactor Availability and Reliability: Recommended Practices	The objective of this publication is to review the existing publication NP-T-5.4. by including latest developments in enhancing availability and reliability of research reactors including associated challenges, experiences and good practices and harmonizing the publication with the current OMARR guidelines and other related IAEA publications. This publication will contain the main part and selected case studies from Member States as examples of successful implementation of programs and good practices in optimization of research reactor availability and reliability. The main part will contain the methodological part, including several chapters that will emphasize the necessary steps to be followed in order to establish and implement a successful program considering the IAEA Safety Standards.

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28. Stakeholder Engagement in a New Nuclear Power Programme	The publication will provide guidance on stakeholder engagement for each phase of the IAEA Milestones Approach, providing examples of activities relevant for each phase of nuclear infrastructure development. The roles and responsibilities of the key organizations in nuclear power programme development will also be discussed in the context of the phased approach. The publication will include operations-level examples on the contents and modalities of stakeholder engagement, including public communication, in the context of newcomer states planning and implementing a new nuclear power programme. The guidance may also be useful to those states intending to expand their existing power programmes. The guidance will link closely stakeholder engagement activities to the development of the nuclear power programme/project, highlighting some of the options that countries face in the different phases. The publication will provide countries considering nuclear power with ideas for activities to foster stakeholder engagement and communication taking into account the lack of resources and budget that is often observed in the initial phase. The publication will then guide organizations moving forward with the programme to scale up their activities and capacities to fit the next phases. The document is not intended as prescriptive guidance, but as a starting point to support countries develop their own strategies and plans. The publication will describe good practices in a new nuclear power programme, highlighting the options available in the area of stakeholder engagement and communication to countries considering, planning or implementing new nuclear power programmes/projects. The document will follow the Milestones Approach and provide and discuss examples in the framework of the three phases, including how stakeholder engagement relates to other nuclear infrastructure development issues. The publication will not provide: - Information on stakeholder engagement in non-nuclear power facility activities. - Information on stakeholder engagement in other life cycle phases (i.e. operation, decommissioning) though it will emphasize why effective stakeholder engagement during nuclear infrastructure development builds an important foundation, including for emergency planning (one of the 19 infrastructure issues). - Wording for key messages, which are to be developed at national or organizational levels.

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29. Managing Environmental Impact Assessment for Construction and Operation in New Nuclear Power Programmes (Rev. 1)	The objective of this revised publication is to provide comprehensive guidance on the environmental protection issues in different phases of the Milestones Approach. Consistent with the Milestone Approach, the publication will: - For Phase 1, provide guidance in: (i) identifying areas of environmental focus that require regulating or regulatory amendments - such as specialized environmental analysis, (ii) identifying the responsibilities of national environmental agencies, (iii) planning the timeline and collection of site baseline information, and (iv) establishing guidelines for environmental reports such as Environmental Impact Assessments, etc. - In Phase 2, provide guidance on how to: (i) prepare for an effective environmental impact assessment evaluation with a holistic approach, (ii) identify and evaluate the meaning of critical environmental sensitivities that must be included in the assessment throughout the life cycle of NPP, (iii) analyse possibilities for environmental impact prevention and mitigation, (iv) developing an environmental management plan, and (v) include environmental aspects in Bid Specifications. - For Phase 3, guide newcomer countries in (i) implementing an environmental management plan during construction and developing the equivalent plan for the operational phase, (ii) planning of the monitoring and auditing programme, and (iii) ensuring an effective link between monitoring/auditing and corrective actions The revised publication is intended to cover all the topics deemed to be useful to Member States in the process of addressing the environmental protection issues in implementing nuclear power programmes. The revised publication will highlight typical environmental implications for nuclear power technology. Awareness of the environmental aspects specific to nuclear power is important for the key organizations, including the national environmental regulatory authorities to understand the unique aspects of implementing a nuclear power programme whilst protecting the environment.
30. The use of Controls for Contaminated Land Management	The objective of the report is to document the key principles, concepts, and Member State experience in the use of controls for contaminated land sites. This will include recording the types of controls that can be used with their benefits and detriments. The publication will present Member State case studies and highlight the good practices, successes, and challenges. All sites where land contamination is present (e.g. NNP, fuel cycle sites, research sites, mining and mineral processing, NORM, former weapons and defence, etc. All sites planning controls or under controls prior or following remedial activities to address land contamination.

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31. Leadership in Nuclear Organizations	This publication is intended to gather and disseminate good leadership strategies and practices for its establishment and development in Member States to: • Raise the awareness of the positive impact of leadership development and strong organizational cultures for safety, security, safeguards, environment, human health and the organizational economics performance; • Benefit future leadership and organizational culture development programmes to be launched or ongoing across Member States; together with its evaluation processes; • Disseminate an understanding of the needs of nuclear leadership in the pursuit of nuclear energy sustainability. This publication provides an insight on the best guidance to address leadership, its development programmes, phases and organisational aspects, and the evaluations within the nuclear facilities and activities; in line with previous IAEA publications related to the topic, together with the experience and good practices from IAEA Member States and international leadership practitioners.

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32. Synergies in Technology Development between Nuclear Fission and Fusion for Energy Production	Taking recent developments into consideration, and in order to identify and explore the synergies between advance nuclear fission technologies and nuclear fusion technologies, this nuclear energy series publication will highlight critical challenges and opportunities that can support the fusion community in its effort to accelerate the technology development and deployment of nuclear fusion systems for energy production. Therefore, the high level objective of this publication is to identify - with an international perspective beyond ITER and towards DEMO and industrial deployment of nuclear fusion - all possible synergies between nuclear fission and fusion in term of technology development, transfer of knowledge and know-how, and common infrastructure. Specific objectives of the publication are: o Promote and facilitate the exchange of information on synergies between advanced nuclear fission and fusion technologies; o Summarize the current status of cooperation between fission and fusion technology development; o Discuss and identify areas of development to bridge the gap to deployment and to assess requirements in the field, leading to more focused efforts in specific areas; o Document the discussions and major findings among subject matter experts to support Member States to better understand and benefit from such synergies; o Serve as a technical reference for key technological aspects and related economic and human resource factors. The final goal is to support the fusion community in its effort to accelerate the technology development and deployment of nuclear fusion systems for energy production, including the early identification of possible showstoppers in the areas of: • Technology development and qualification of Structures, Systems and Components • Waste management and fuel cycle; • Economics; • HR development, capacity building and infrastructure development; • 3S i.e. safety, security and safeguards. The NES publication will provide insight on all these areas as well as examples of good practices and lessons learned, and will offer suggestions to accelerate the transfer of technology, knowledge and know-how from fission to fusion..

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33. Evaluation of a Management System for Nuclear Facilities	The objective of this publication is to offer guidance with good practices for the conduct of assessment, evaluation and review (denoted as evaluations) of an integrated management system or its parts of nuclear organizations owning or operating a nuclear power plant (NPP) or its project. This practical guidance will provide generic approaches, and examples where applicable. There are different types of nuclear organizations and evaluation cases and, consequently, one evaluation scope or approach may not fit all. The publication may be used together with NG-T-1.3 which includes guidance about developing a management system. This information is intended to help all people involved in evaluating the elements of the management system for which they have responsibility, which they are part of, or which they have been requested to evaluate. It should help to find out if a management system is useful for its purpose and uses The publication will provide guidance, practical examples and good practices for the different types of evaluations of the management system including self-assessment. All levels of an integrated management system or its parts (corporate level, NPP level, strategy level, processes and their indicators, etc.) are foreseen to belong to the scope. All life cycle phases of a NPP from the project development (milestone phase 2) to the final shutdown are foreseen belong to the scope. The emphasis is in operating NPPs and the management systems of their organizations, but other phases, other organizations (e.g. nuclear regulatory bodies) and other types of nuclear facilities may also benefit from the publication. GSR Part 2, GS-G-3.1 and 3.5, and other documents mentioned under 7 discuss and present requirements to management systems and their parts especially dealing with safety. This publication DPP scope includes all the vital objectives of an organization owning and operating a NPP (not limited to safety). Also, the management system is expected to develop in different NPP life cycle phases, and its evaluation needs to take this into account. The preliminary table of contents manifests the ideas identified as potentially important for different evaluations.

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34. Nuclear Hydrogen Business Case – Evaluation of Factors for Deployment	Given the variables which decision-making will have to consider as well as their correlation, it would be of great interest to identify the factors seen by the utilities as crucial for the business case of nuclear hydrogen production and the market circumstances in which they are selected. This could be of great help to Member States considering an expanded role of nuclear power, especially in the context of effective economy decarbonization. Equally important, and of great interest to Utilities, it could highlight the potential for improved economics of nuclear power by developing additional revenue streams. More specifically, this publication will include case studies and discuss among other (1) how to build the business case, critical components, (2) the rationale for nuclear hydrogen production, (3) the specific market conditions, (4) the preferred technologies such as low or high temperature electrolysis, thermochemical cycles, steam reforming etc. as well as relevant context, (5) competing and long-term alternatives, (5) the approaches for optimizing the revenues, and (6) need for environmental premiums. These are the factors that influence the business case for nuclear hydrogen, though their importance can vary in specific market conditions. Correctly assessing the business case, the elements of which are discussed here, can lead to increased competitiveness of both, nuclear power and hydrogen generation. The scope of the publication encompasses Utility and user industry perspectives on what constitutes a sustainable business case for nuclear hydrogen production. It will therefore include Utility and user rationale for nuclear hydrogen production, technology considerations with relevant licensing and cost implications, supply chains, markets and relevant incentives as well as business case optimization approaches.
35. Local Stakeholder Involvement in Nuclear Programmes	To provide practical guidance relevant to stakeholder engagement at the local level for all nuclear facilities and activities. Practical guidance for stakeholder involvement at the local level concerning all nuclear facilities and activities, except for topics relevant to communication with the public in a nuclear or radiological emergency; and details relevant to specific types of nuclear facilities or activities.

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36. International Safeguards in the Design of Facilities for Radioactive Waste Management	The objective of this publication is three-fold. First, inform waste management professionals (ideally, at the design stage) of the safeguards obligations that exist around nuclear materials declared as waste during the complete lifecycle of the waste. In some cases, the waste professionals may not be cognizant of what restrictions may be imposed on the waste forms, e.g., verification needs, tracking needs, termination criteria, etc. Second, inform Member State safeguards officials of the general needs and processes utilized by radioactive waste management professionals. There may be a lack of technical understanding by the safeguards professional about the processes used to process, condition, and package waste materials for eventual storage and disposal. The physical realities surrounding these packages may influence the specific safeguards techniques that may need to be applied. Third, provide an accurate and consolidated set of information from the departments of NE and SG on this topic to serve as a basis for continued discussion on this topic with Member States. In both departments, there is a need to involve the other as soon as reasonable in discussions on this topic to ensure all obligations are being met by the state with respect to safeguards and that sound practices in radioactive waste management are followed This document will cover two major topics: a general overview of IAEA safeguards and how safeguards are incorporated into waste management practices. The former topic will be very similar to text in previous entries in this series (e.g., NF-T-3.1). Each member in this series ("International Safeguards in the Design of…") includes a short chapter that gives the relevant background information on safeguards for non-safeguards professionals. Preservation of this structure is ideal as it makes the volume standalone with enough general information to be useful while simultaneously pointing to expanded reading materials. The latter will include a general overview of waste management practices and techniques as well as where safeguards would need to be integrated. A series of examples (based on real situations encountered by the Agency and Member States) will be presented as an ANNEX to the publication that will serve to reinforce concepts.

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37. Methodology for Nuclear Energy Cost Analysis	The main objective of the publication is to address nuclear newcomer countries needs in terms of approaches for cost estimation and management of cost estimates. Nuclear newcomers are interested primarily in infrastructure development and on the construction – and operation – of their first nuclear power plant. The report is intended to be periodically updated (e.g., every 2-4 years) to update information and accommodate additional topics of interest to IAEA Member States. The first release of this publication will focus on activities such as infrastructure development (both "soft" and physical infrastructure), reactor construction and operation (the focus will be on the present generation of nuclear reactors (Generation III and III+) and on the Small Modular Reactor (SMR) likely to be deployed within the next 10-20 years), reactor decommissioning, and management of spent nuclear fuel and radioactive waste. Estimating the costs attached to each activity, identifying their drivers, and exploring ways to reduce them, will be the main topics to be developed. The cost estimating techniques used in the conventional power industry derive from existing practices in large infrastructure projects and the process (chemical and petrochemical) industry. These approaches, described, for example, in AACEI's publications (AACEI stands for *Association for the Advancement of Cost Engineering International*), can be adjusted to the nuclear industry. Other potential references, and starting points, to frame cost estimating for nuclear plants, could be the US GOA *Cost Estimating and Assessment Guide*, the UK HM Treasury *Green Book (Appraisal and Evaluation in Central Government)*, the US NASA *Cost Estimating Handbook*, and the US DOE *Advanced Fuel Cycle Cost Basis* report. The *table of contents*, in Annex, suggests an outline for the publication. The outline of the report is designed so that future report revisions can provide updated content and include additional cost areas (e.g., innovative nuclear power and fuel cycle technologies).
38. Costs Assessment Methodologies for the Back End of the Fuel Cycle	The objective is to develop a **guidance** document on developing the back end of the fuel cycle (BEFC) cost elements. It is proposed to structure the document in a manner whereby it can be readily updated. The main body of the document will be generic high level guidance and the appendices will contain reference information which will evolve with time. Reference information to include tools for making decisions (matrix, map) including: risks and uncertainties valuation; approach/methodology for comparing options; and case studies and appropriate use of base data.

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39. Financing NPP in the Liberalised Market (Reference Report)	Provides case-by-case information on the financial models and contract approaches used or proposed by vendors/ host countries for building NPPs. The objective is to provide examples, therefore it's a financial cases database/ reference book Ensures practical application of financial approaches (cases and examples) and help Member States with practical understanding of financing theories (what was used, how it was used, what's the outcomes, what's the challenges). Covers all the world's cases (all cases of building and planning NPPs) – the uniqueness of the report is pulling all the cases together. • Provides information about financing of the most cases of NPP construction (if the information is available from public sources). Includes the update on market reforms for the countries which have, build (in process), or propose (plan) to build NPPs, and the impact of the market reform on the model. • Also includes information about government incentives and subsidies for supporting nuclear (current and under construction) in the liberalized market.
40. Existing and Advanced Nuclear Fuel Cycle Technical Options for Waste Burden Minimization	The document aims at providing policy and decision makers with information about how different Fuel Cycle strategies can minimise the burden of generated waste in order to help them to make informed decisions. The objective is to write a high-level document, "easy to read", for policy and decision makers using the detailed information already existing in the literature, not duplicating this effort. The document aims at reviewing and updating the technological developments in current and advanced fuel cycles leading to minimization of waste burden at disposal as well as to identify key issues related to hydro and pyro processing technologies for waste burden reduction. To provide full spectrum of available and/or future options for Spent Nuclear Fuel Management, with emphasis on waste burden minimisation, structured in an increasing order of sophistication and performances. The spectrum can provide appropriate options for Member States having different environmental and safety constraints.

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41. Development of waste acceptance criteria for low and intermediate level waste	The objective of the document is to provide background information and advice on the development, implementation and use of radioactive waste acceptance criteria in all stages of the radioactive waste management. The quantitative or qualitative requirements shall be identified, associated operational parameters proposed and relevant testing or measuring procedures described. Non-conformity procedures shall be outlined and adequate formal and technical action explained. The document will provide a brief specification of typical waste package types and relevant handling, transportation, storage and disposal systems for low and intermediate level waste. With respect to this, needs for waste acceptance procedures will be determined and principles for their application explained. Waste acceptance criteria for interfaces among particular waste management operations (transport, storage and disposal) will be listed and characterised respecting their division in the safety, technical and administrative categories. Information regarding each criterion will include bases for its formulation/development, parameter(s) suitable for its quantification, suitable measuring method(s) and control procedures during takeover of a waste package. Specific features of different waste packages will be respected. Specific space will be devoted to the problem of determination of preliminary waste acceptance criteria for countries without disposal system: potential approaches and solutions will be discussed. Finally, the document will deal with management of non-conformities. In particular, relevant procedures, decision making, potential actions and principles for their selecting will be described.

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42. Industrial Involvement to Support a National Nuclear Power Programme (Rev.1)	The objective of this revised publication is to update the current IAEA publication “Industrial Involvement to Support a National Nuclear Power Programme (IAEA NE Series No. NG-T-3.4)” by providing comprehensive guidance on the industrial involvement in respective phases of the Milestones Approach. It will include updates of current trends in the area and incorporate case studies with good examples from Member States as well as the relations between industrial involvement and SMRs. Industrial involvement of the recipient country can contribute to the macro-economic impact of the project and prepare the country in the long run to localize some elements of the supply chain or services associated to the project. This publication is to facilitate better understanding of overall industrial involvement and its core topics crucial for deployment of nuclear power plants by identifying specific actions necessary to achieve milestones in respective phases and providing live experience in the real world, whether it is good or not good, with Member States in reference to countries that successfully deployed nuclear power plants. The objective of this revised publication is to update the current IAEA publication “Industrial Involvement to Support a National Nuclear Power Programme (IAEA NE Series No. NG-T-3.4)” by providing comprehensive guidance on the industrial involvement in respective phases of the Milestones Approach. It will include updates of current trends in the area and incorporate case studies with good examples from Member States as well as the relations between industrial involvement and SMRs. Industrial involvement of the recipient country can contribute to the macro-economic impact of the project and prepare the country in the long run to localize some elements of the supply chain or services associated to the project. This publication is to facilitate better understanding of overall industrial involvement and its core topics crucial for deployment of nuclear power plants by identifying specific actions necessary to achieve milestones in respective phases and providing live experience in the real world, whether it is good or not good, with Member States in reference to countries that successfully deployed nuclear power plants.

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43. Guidelines for an Ageing Management, Modernization and Refurbishment Programme for a Research Reactor	The objective of this publication is to provide guidance in establishing, implementing and improving ageing management, refurbishment and modernization programme for a research reactor planned or under construction or in operation taking into consideration the requirements in SSR-3 and the accompanying guidance in Specific Safety Guide (SSG-10). The publication will contain all aspects, necessary steps in the preparation of the programmes, a collection of selected papers describing Ageing Management, Refurbishment and Modernization (AMRM) programmes and their implementation at different RRs, as presented in IAEA meetings; specifically: • Joint IGORR 2013 & IAEA Technical Meeting, 13-18 October 2013, Daejeon, Korea. • Joint TRTR 2015 & IAEA TM 49631 on Research Reactor Ageing Management, Refurbishment and Modernization 5-9 October 2015, Brewster, MA – USA. • IAEA TM on Research Reactor Ageing Management, Refurbishment and Modernization, 29 October to 2 November 2017; Austria, Vienna. • IAEA Consultancy Meeting on Guidelines to establish and implement an Ageing Management Programme for Research Reactors"; 3-6 September 2019. IAEA Headquarters Vienna, Austria. • Joint IGORR and IAEA TM on Research Reactor Ageing Management, Refurbishment and Modernization, 31 August to 4 September 2020, Kazan, Russian Federation. It is important to mention that this publication assumes a decision to modernize or refurbish has been made with sound and strategic justification. The motivation, project scope, complexity, means of implementation, and lessons learned are diverse; as are the size, age, organizational complexity and utilization of the facilities involved. Participants in the related meetings contributed to general discussions of RR specific considerations for large capital project management. For the large number of relatively aged reactors, ageing management programmes have arisen from routine inspection, corrective maintenance and system overhaul, resulting in thorough analyses of SSC degradation under natural wear and reactor level conditions of temperature, pressure and radiation. Through the provision of the proposed technical guide, as well as networking and cooperation among organizations within the international RRs community, strategies for managing similar systems, components and tools for monitoring degradation and auditing programmes will be made available to be an important contributor to operating life extension of the facility. This publication will contain the main part and selected case studies from Member States as examples of successful implementation of ageing management, refurbishment and modernization programmes and good practices. The main part will contain the methodological part, including several chapters that will emphasize the necessary steps to be followed in order to establish and implement an ageing management programme based on the IAEA Safety Standard SSG-10.

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44. Nuclear Power Plant Project Engineering	Several organizations internationally offer engineering management knowledge basis; however, the specifics requirements of nuclear projects may not be reflected completely within existing resources. The objective of this publication is to develop guidance on engineering management for the nuclear power plant projects to: • Support owners for preparation and implementation of nuclear power plant construction and subsequent operation. • Help owners develop their technical support organization (TSO). • Centralize (vs site specific) engineering management. • Share good practices and present experiences related to engineering management. • Build a knowledge base for nuclear power plant project engineering management. This publication is intended primarily for providing practical information about various management approaches necessary to manage nuclear project engineering activities during nuclear power plant construction, commissioning and operation. A coordinated approach is presented, facilitating compliance with national and major international legislative and regulatory requirements and standards. IAEA publications are referred to, where appropriate, for more detailed information and guidance on specific aspects.
45. Industrial Involvement to Support a National Nuclear Power Programme	The objective of this revised publication is to update the current IAEA publication "Industrial Involvement to Support a National Nuclear Power Programme (IAEA NE Series No. NG-T-3.4)" by providing comprehensive guidance on the industrial involvement in respective phases of the Milestones Approach. It will include updates of current trends in the area and incorporate case studies with good examples from Member States as well as the relations between industrial involvement and SMRs. Industrial involvement of the recipient country can contribute to the macro economic impact of the project and prepare the country in the long run to localize some elements of the supply chain or services associated to the project. This publication is to facilitate better understanding of overall industrial involvement and its core topics crucial for deployment of nuclear power plants by identifying specific actions necessary to achieve milestones in respective phases and providing live experience in the real world, whether it is good or not good, with Member States in reference to countries that successfully deployed nuclear power plants. The revised publication will highlight implications to national/local industry, the government, and public organizations in terms of introducing or expanding the nuclear power programmes. And it will also focus on actions in each phase and address newly raised issues such as SMRs and case studies of other Member States.

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