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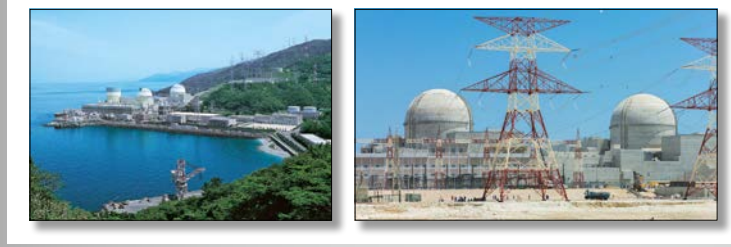
Nuclear Law Bulletin No. 100

Volume 2018/1



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60th anniversary
NEA
NUCLEAR ENERGY AGENCY

Legal Affairs

Nuclear Law Bulletin
No. 100

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NUCLEAR ENERGY AGENCY
ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT

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NUCLEAR ENERGY AGENCY

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The mission of the NEA is:

- to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes;
- to provide authoritative assessments and to forge common understandings on key issues as input to government decisions on nuclear energy policy and to broader OECD analyses in areas such as energy and the sustainable development of low-carbon economies.

Specific areas of competence of the NEA include the safety and regulation of nuclear activities, radioactive waste management, radiological protection, nuclear science, economic and technical analyses of the nuclear fuel cycle, nuclear law and liability, and public information. The NEA Data Bank provides nuclear data and computer program services for participating countries.

Also available in French under the title:
Bulletin de droit nucléaire n° 100

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Foreword

In 1968, the European Nuclear Energy Agency (ENEA), the predecessor organisation to today's OECD Nuclear Energy Agency (NEA), published the first edition of the *Nuclear Law Bulletin* (NLB). Fifty years later, the 100th edition is now being published. While much has changed in the field of nuclear energy over the past 50 years, the NLB has remained a reliable reference for comprehensive information on nuclear law developments.

What started as an "information only" publication has now become the primary source for legal experts to share their scholarly writing on the important subjects of the day – whether it is nuclear liability, nuclear safety, radioactive waste management or any of the other many interesting topics in this field. Almost 200 articles have been published since the first one appeared in 1970. Reading through a list of article titles over time provides a rare glimpse into the history of nuclear energy and the evolution of nuclear law in particular. As mentioned by others in this edition, the nuclear community needs legal professionals and academics to keep contributing their critical analyses for the NLB to carry on for another 50 years.

As stressed in the Foreword to the first edition, it must be mentioned again that the *Nuclear Law Bulletin* would not be possible without the co-operation of the many correspondents from NEA member and non-member countries, the International Atomic Energy Agency, the European Commission, the United Nations and the many other international organisations that have contributed over the years. The NLB would cease to exist without these regular contributions of case law, legislative and regulatory activities updates, documents, legal texts, and news briefs. Thank you to all of the governments, ministries, agencies, organisations and individual correspondents for 50 years of commitment. This edition of the NLB is dedicated to you.

William D. Magwood, IV

June 2018
Boulogne-Billancourt, France

Acknowledgements

In addition to the authors of the articles and studies, the Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA) would like to thank the following individuals for their contributions to this edition of the *Nuclear Law Bulletin*: G. Chen (China), F. Touïtou-Durand (France), M. Ono (Japan), U. Adomaitytė (Lithuania), A. Dantas and M. Sousa Ferro (Portugal), K. Kasnar and A. Skraban (Slovenia), S. Knopp Pisi (Switzerland), J. Scro (United States), A. Popov (European Commission) and A. P. Chirtes (International Atomic Energy Agency).

The NEA would also like to thank the following individuals for their special contribution to the 100th issue of the *Nuclear Law Bulletin*: S. G. Burns, R. Dussart-Desart, N. Pelzer, P. Reyners, J. Schwartz and P. Strohl.

The information submitted to the NEA by these individuals represents the opinions of the authors alone and does not purport to represent the official views or the policies of their governments or any other entity.

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100TH EDITION SPECIAL FEATURE

Nuclear Law Bulletin: A look back at the past 50 years

First published:	1968
Original colour:	orange
Current colour:	grey
Editions published:	100
Supplements published:	60
Shortest edition:	NLB No. 5 (32 pages)
Longest edition:	NLB No. 90 (281 pages)
Average edition length:	102 pages
Total pages published:	10 140
First article published:	"Civil Liability and Nuclear Law", by José María Lopez Olaciregui, NLB No. 5, 1970
Total articles published:	196
Average number of articles per edition:	2
Most popular subject for articles:	liability and compensation
Individual authors published (articles):	176
Most published author:	Professor Norbert Pelzer (9 articles published)
Total studies published:	25
Individual authors published (studies):	12
Correspondents:	92 (as of 1 May 2018) from 58 countries and 2 international organisations
First offered for free online as of the date of publication:	NLB No. 93 (2014)

Foreword to the 1st issue *Nuclear Law Bulletin* No. 1 (1968)

FOREWORD

The increasing number of nuclear installations now being commissioned, often for industrial operation, has given rise to problems of growing importance in the application of nuclear law. In various countries, laws and regulations are being prepared or revised. Generally, these texts are designed to interpret and apply, on a national basis, the uniform rules and recommendations which have been adopted internationally. It would be unfortunate if their implementation, which obviously depends on particular national circumstances, should result in maintaining or aggravating the differences which were meant to be avoided.

Therefore it seems useful to provide as much information as possible, to administrative and industrial circles, on legislation and case law in other countries having the same interests and similar concepts, as well as on the work of international organisations. This information should facilitate the continuing efforts for harmonisation which remain necessary.

With this object in mind, ENEA has undertaken publication of a Nuclear Law Bulletin. This Bulletin will include information only, taken whenever possible from official sources, without however expressing any doctrinal views. As far as possible, accounts of legislative work and case decisions will be completed by "in extenso" publication, in English and French, of the most important texts.

Regular publication of the Nuclear Law Bulletin can be achieved only with the kind co-operation of correspondents from competent departments in the different countries or international organisations. The network of these correspondents needs to be enlarged still further. We should like to thank most sincerely the many lawyers who have enabled us to publish the first issue of the Bulletin.

The frequency of publication of the Bulletin will depend on the amount of information and texts relating to nuclear law. It is expected that two to four issues per year will be published.

– 5 –

Foreword to the 5th anniversary edition *Nuclear Law Bulletin* No. 10 (1972)

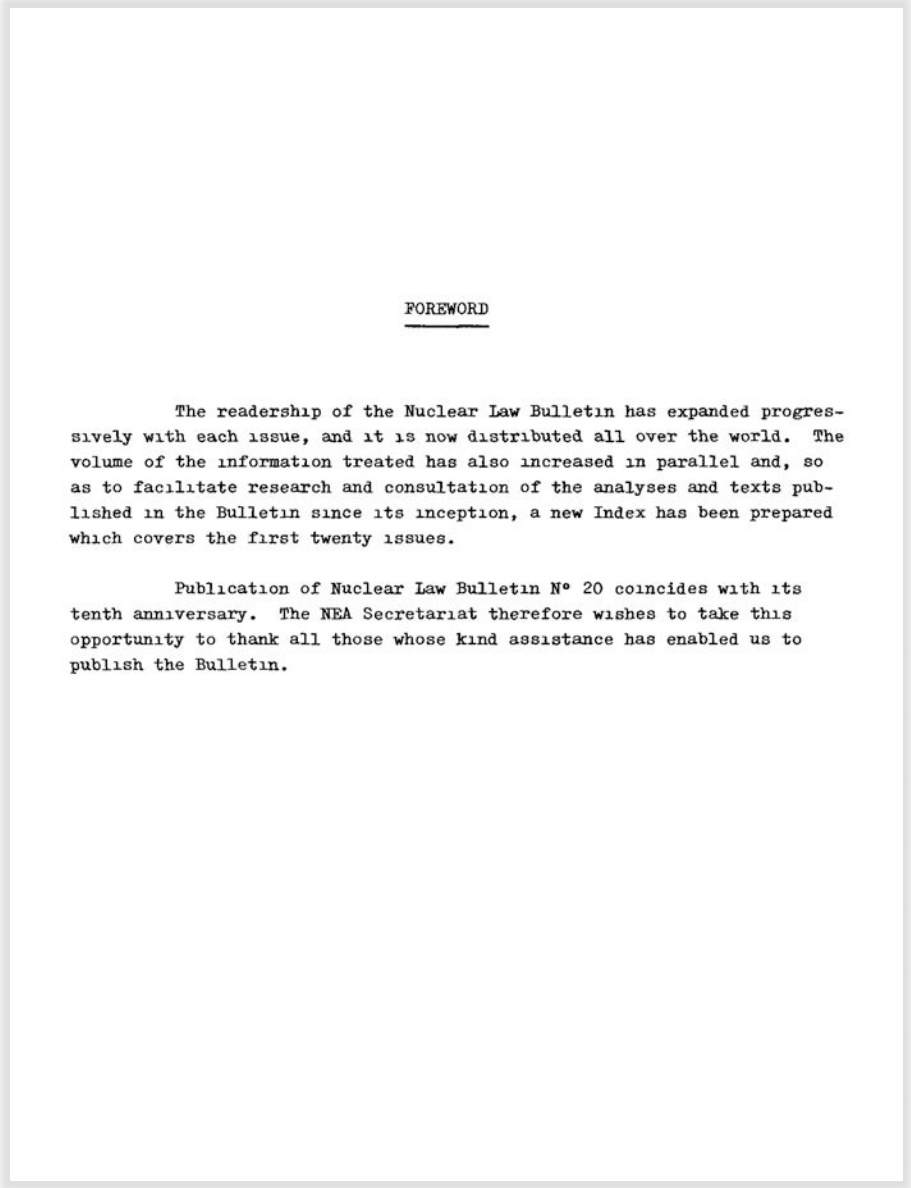
FOREWORD

With its 10th issue, the Nuclear Law Bulletin rounds off its first five years of existence and, issue after issue, its circle of readers has steadily been increasing. We should like to take this opportunity to thank our correspondents, whose kind assistance has made the publication of this Bulletin possible.

For some time now, readers have been suggesting that we should establish an Index to facilitate research and consultation of the information and texts published in the Bulletin since its inception. This issue is therefore accompanied by an index of the contents of the first ten Bulletins, in addition to its usual supplement. The Index will be updated at regular intervals.

- 3 -

Foreword to the 10th anniversary edition *Nuclear Law Bulletin* No. 20 (1977)



FOREWORD

The readership of the Nuclear Law Bulletin has expanded progressively with each issue, and it is now distributed all over the world. The volume of the information treated has also increased in parallel and, so as to facilitate research and consultation of the analyses and texts published in the Bulletin since its inception, a new Index has been prepared which covers the first twenty issues.

Publication of Nuclear Law Bulletin N° 20 coincides with its tenth anniversary. The NEA Secretariat therefore wishes to take this opportunity to thank all those whose kind assistance has enabled us to publish the Bulletin.

Foreword to the 20th anniversary edition *Nuclear Law Bulletin* No. 40 (1987)

FOREWORD

Almost twenty years have gone by since the Nuclear Law Bulletin was first published Its aim then as now was to disseminate information from authorised sources on acts, regulations, case-law and international agreements, all making up the legislation on nuclear energy. Along the years, the contents of the Bulletin have expanded, and today it also covers the work of the competent international organisations and books on nuclear law, in addition to publishing articles by specialists Its readership is constantly expanding and includes subscribers from more than fifty countries.

The difficulties experienced at present with the use of nuclear energy, in a climate overcast by the Chernobyl accident, further enhances the importance of regulatory questions Therefore, the Bulletin will continue to provide, as completely as possible, information on the latest developments, reflecting at the same time with particular attention the concerns of lawmakers in this field In this connection, the three articles in this issue clearly demonstrate that there are still novel aspects of the problematics of nuclear law to be explored.

A new Analytical Index comes with Bulletin No 40, covering the forty issues already published, and supersedes the previous Index

The NEA Secretariat wishes to take this opportunity to thank all those whose kind assistance has made it possible to continue publishing the Bulletin

- 3 -

Foreword to the 30th anniversary edition *Nuclear Law Bulletin* No. 60 (1997)

Foreword

This 60th edition of the *Nuclear Law Bulletin* marks the 30th year of publication of this legal periodical which initially appeared in February 1968. That particular date marked in turn another anniversary: the creation in February 1958 of what was then called the European Nuclear Energy Agency. We would like to take this opportunity to thank readers for their support.

In 1997, significant steps were taken in the field of international nuclear energy law. This issue of the *Bulletin* provides details of the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage as well as the Convention on Supplementary Compensation for Nuclear Damage, both of which were adopted in September 1997. Another highlight of this issue is an article on the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management, also adopted in September.

The *Supplement* to this *Bulletin* reproduces the texts of three recently enacted pieces of legislation, which, respectively, govern nuclear activities in Canada, Hungary and Lithuania.

Finally, it should be noted that this *Bulletin* provides information on several Central and Eastern European countries. For a more comprehensive review of nuclear law in such countries, readers are referred to this year's revised and expanded edition of the *Overview of Nuclear Legislation in Eastern Europe*, which will soon be available through the OECD Publications Service.

3

Foreword to the last *Nuclear Law Bulletin* published under the direction of Patrick Reyners *Nuclear Law Bulletin* No. 74 (2004)

FOREWORD

As our regular readers are aware, the Nuclear Law Bulletin does not usually comprise a foreword. However, this is a very special edition as it is the last Bulletin published under the direction of Patrick Reyners, Head of Legal Affairs of the Nuclear Energy Agency, who shall retire from this post early in 2005.

Patrick has in fact been overseeing the Nuclear Law Bulletin since its inception in 1968, and therefore the number of this issue – NLB No. 74 – gives you an exact indication of how many editions have benefited from his invaluable contribution.

His colleagues at the NEA who contribute to the preparation of this publication would like to take this opportunity to thank him for his candour, integrity and unfailing guidance, which have helped make the Nuclear Law Bulletin a publication of international renown. They express their warmest wishes to him for the future.

The NLB Editorial Team.

3

Foreword to the 40th anniversary edition *Nuclear Law Bulletin* No. 82 (2008)

FOREWORD

This issue of the *Nuclear Law Bulletin* coincides with the 50th anniversary of the OECD Nuclear Energy Agency under whose auspices we have been proudly publishing the Bulletin for 40 years now.

According to Article 1 of its Statute, the purpose of the Agency is to "…further the development of the production and uses of nuclear energy, including applications of ionising radiations, for peaceful purposes by the participating countries, through co-operation between those countries and a harmonisation of measures taken at the national level".

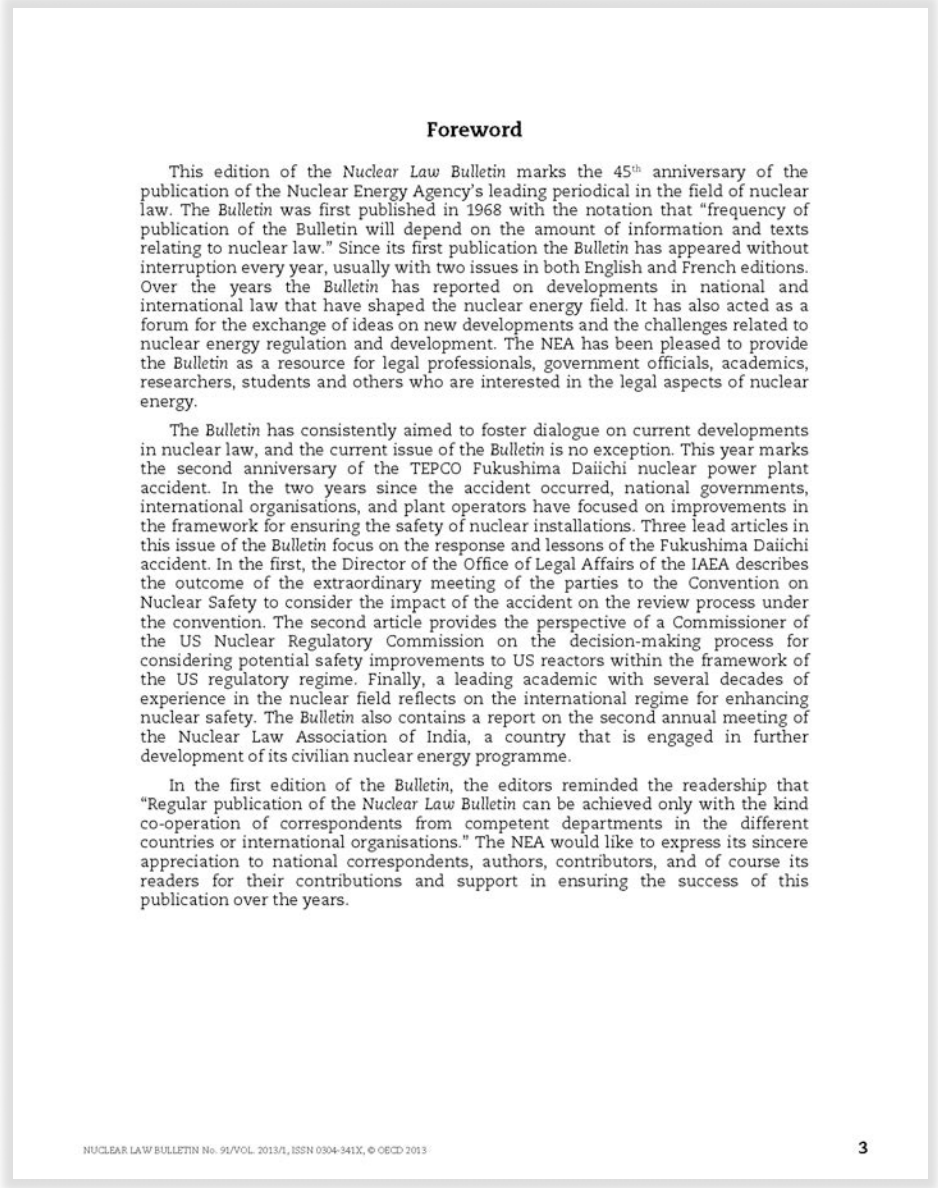
Initially, the NEA's activities focused on laying the foundation for nuclear co-operation, including the establishment of joint R&D undertakings such as the Halden and Dragon reactor projects, and the Eurochemic prototype plant for reprocessing spent nuclear fuel. Later on, the Agency's role evolved into a forum for co-operation among member countries' national nuclear programmes, particularly in the health, safety and regulatory areas. In the early 1990s, the NEA also engaged in a limited outreach programme with countries of Central and Eastern Europe. Its current mission is to assist its member countries in maintaining and further developing, through international co-operation, the scientific, technological and legal bases required for the safe, environmentally friendly and economical use of nuclear energy for peaceful purposes.

Throughout its history, the NEA has benefitted significantly from the homogeneity of its membership, its flexible working methods, the depth and quality of its technical work, and its small size and cost-effectiveness. These features will continue to be the key to the role that the Agency plays in the future, as the role of nuclear power itself evolves.

The NLB Editorial Team
December 2008

3

Foreword to the 45th anniversary edition *Nuclear Law Bulletin* No. 91 (2013)



Foreword

This edition of the *Nuclear Law Bulletin* marks the 45th anniversary of the publication of the Nuclear Energy Agency's leading periodical in the field of nuclear law. The *Bulletin* was first published in 1968 with the notation that "frequency of publication of the Bulletin will depend on the amount of information and texts relating to nuclear law." Since its first publication the *Bulletin* has appeared without interruption every year, usually with two issues in both English and French editions. Over the years the *Bulletin* has reported on developments in national and international law that have shaped the nuclear energy field. It has also acted as a forum for the exchange of ideas on new developments and the challenges related to nuclear energy regulation and development. The NEA has been pleased to provide the *Bulletin* as a resource for legal professionals, government officials, academics, researchers, students and others who are interested in the legal aspects of nuclear energy.

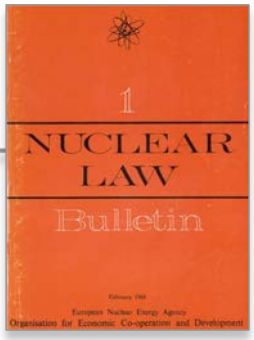
The *Bulletin* has consistently aimed to foster dialogue on current developments in nuclear law, and the current issue of the *Bulletin* is no exception. This year marks the second anniversary of the TEPCO Fukushima Daiichi nuclear power plant accident. In the two years since the accident occurred, national governments, international organisations, and plant operators have focused on improvements in the framework for ensuring the safety of nuclear installations. Three lead articles in this issue of the *Bulletin* focus on the response and lessons of the Fukushima Daiichi accident. In the first, the Director of the Office of Legal Affairs of the IAEA describes the outcome of the extraordinary meeting of the parties to the Convention on Nuclear Safety to consider the impact of the accident on the review process under the convention. The second article provides the perspective of a Commissioner of the US Nuclear Regulatory Commission on the decision-making process for considering potential safety improvements to US reactors within the framework of the US regulatory regime. Finally, a leading academic with several decades of experience in the nuclear field reflects on the international regime for enhancing nuclear safety. The *Bulletin* also contains a report on the second annual meeting of the Nuclear Law Association of India, a country that is engaged in further development of its civilian nuclear energy programme.

In the first edition of the *Bulletin*, the editors reminded the readership that "Regular publication of the *Nuclear Law Bulletin* can be achieved only with the kind co-operation of correspondents from competent departments in the different countries or international organisations." The NEA would like to express its sincere appreciation to national correspondents, authors, contributors, and of course its readers for their contributions and support in ensuring the success of this publication over the years.

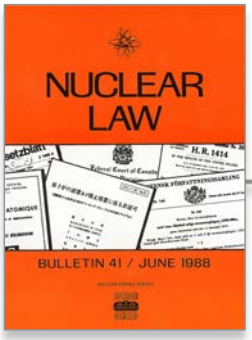
NUCLEAR LAW BULLETIN No. 91/VOL. 2013/1, ISSN 0304-341X, © OECD 2013

Nuclear Law Bulletin: Publication covers through time

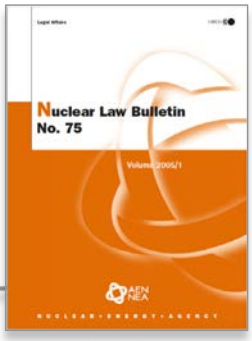
1968
NLB No. 1



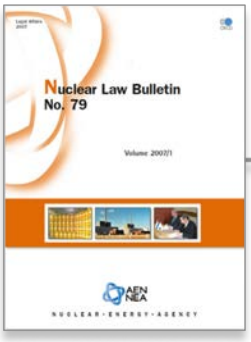
1988
NLB No. 41



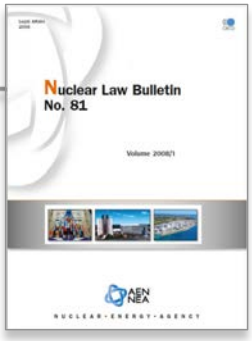
2005
NLB No. 75



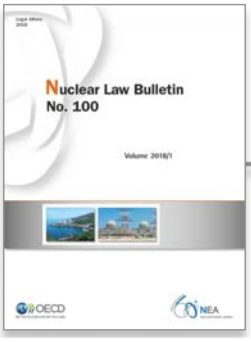
2007
NLB No. 79



2008
NLB No. 81



2018
NLB No. 100



Reflections on the *Nuclear Law Bulletin*

As told by the Head of the Office of Legal Counsel and the Heads of predecessor offices: the Legal and External Relations Division of the ENEA and NEA Legal Affairs

Pierre Strohl

Former Head, ENEA Legal and External Relations Division (1966-1974)

The first issue of the *Nuclear Law Bulletin* (NLB) was published in February 1968, shortly before the infamous student riots of May 1968 in France. Obviously, the two events were not related, other than perhaps a shared desire at the time to do something new – or at least to do things differently.

Joking aside, the original idea for the NLB first arose from an already long-standing observation that the use of nuclear energy made it highly desirable to have a special legal regime for scientific and industrial activities in the nuclear field. The purpose of this regime would be to supplement, if not to a large extent replace, the common law in force. Provisions on major issues such as radiological protection, the safety of installations, and liability for damage caused would be derived from conventions and international recommendations, regardless of the fact that laws and regulations directly applicable in individual countries were in any case published in their official journals and in consequence readily accessible.

There was another reason behind my idea of launching a joint publication about nuclear law, namely to facilitate efforts to harmonise national legislations, as stated in the Foreword to the first issue. This initiative was linked to the Nuclear Energy Agency's mission of fostering the harmonisation of national measures for the development of nuclear energy, and in particular the legislation of participating countries. It was with this in mind that the *Nuclear Law Bulletin* was designed to serve as a source of information, which could be particularly useful when determining and changing national laws.

The first issue of the *Bulletin* was a modest affair, and its chosen title equally humble. The intention from the outset was to err on the side of diplomacy and caution and solely publish national texts, but two years later the *Bulletin* started to include comments and articles on the substance of national laws. Accordingly, its content became more substantial and it is likely that the *Bulletin* played a role in formulating a doctrine expressing the particularities of nuclear law.

While a glance at how the *Bulletin* has developed reveals a certain degree of continuity, the most striking change lies in the major progress made in terms of content. The continuity is reflected in the frequency of publication, still two issues a year; the general format; and the use of national correspondents. However, the advances that have been made in terms of the volume and range of published texts, their presentation and the quality of the analyses are even more remarkable. I must also admit that the initial appearance of the *Bulletin* based on my choice of colour

and cover design, which were not to everyone's taste at the time, is no match for the elegance of the current issue. I am delighted to see the hundredth edition of the *Nuclear Law Bulletin* now available on the news stands, and would like to sincerely congratulate my present-day colleagues for the quality of this publication.

Patrick Reyners

Former Head, NEA Legal Affairs (1978-2005)

Pierre Strohl and Norbert Pelzer, in particular, have offered in this anniversary issue a detailed and learned account of the history of the *Nuclear Law Bulletin* (NLB). Julia Schwartz, Stephen Burns and Ximena Vásquez-Maignan have added their testimony to the commemoration. Therefore, I would rather like to share with the readers some recollections about what has actually been an important part of my professional life. Perhaps some will remember.

As one knows, the initial idea to create a journal dedicated to the still nascent law governing the uses of nuclear energy come from Pierre always inventive mind, at the time the European Nuclear Energy Agency's (ENEA) Legal Director. His other fateful decision was to designate me, a most junior and inexperienced member of the legal section, as "implementor" of the project. Retrospectively, my satisfaction at being assigned this responsibility would probably have been mitigated, had I known that *de facto* I would remain the editor of this publication from its first issue (1968) until NLB No. 75 (2005) when I finally retired. I still remember that the first manifestation of independence of my dear ex-colleagues was to change immediately the cover of the *Bulletin*, before remaining stubbornly orange.

Launching the *Bulletin* was also a sort of gamble: would there be enough material to allow a semestrial publication in such a narrow field? Also, in the 1960s, it was unusual for an intergovernmental organisation to have a legal journal sold on subscription, open to the public. That may explain why the editorial policy was initially quite restrictive, consisting of neutral analyses of laws and regulations, and the odd international agreement. This required an "NLB-mind-set": collecting every scrap of available information in the field, thanks notably to a network of benevolent correspondents as well as the many colleagues over the years who laboured with me on this task, to whom I express my gratitude. Working then on the *Bulletin* (in that pre-Internet period) was a bit akin to the life of Middle-Age monk copyists.

As noted by others, the *Bulletin* over the years has progressively become more diversified and richer in substance (and fatter…). I am proud to see that it continues for the nuclear law community to serve as the most authoritative source of information in this domain. As a former editor and also on behalf of the International Nuclear Law Association, I wish it a long life.

Julia Schwartz

Former Head, NEA Legal Affairs (2005-2011)

Over the course of its 50-year history, the *Nuclear Law Bulletin* (NLB) has come to be regarded as the standard reference publication within the international nuclear law community. Covering a wide range of nuclear law related issues, the NLB is an important mechanism for implementing the Nuclear Energy Agency's (NEA) mandate to broadly disseminate the results of its own activities as well as information on the conventions and agreements, guidelines, standards and good practices that have been agreed to by its member countries.

It also constitutes an important mechanism by which member countries of the NEA in particular can benefit from that part of the NEA's mission to assist in "maintaining and further developing, through international co-operation, the … legal bases required for a safe, environmentally sound and economical use of nuclear energy for peaceful purposes". In fact, as Pierre Strohl, the founding father of the NLB, has pointed out in his reflection, the initiative to produce this publication flowed from the mandate contained in an earlier version of the NEA's mission, this being "to contribute to the harmonisation of national measures for the development of nuclear energy, and in particular the harmonisation of member countries' legislation in the nuclear field."

From its rather modest beginnings back in 1968, the NLB has continually evolved in an effort to address, in a timely manner, both national and international developments in nuclear law as well as important changes to technology that have made access to information much simpler and yet much more comprehensive. To do so, it has always relied heavily upon the NEA's network of national contributors who play an essential role in providing the NEA Secretariat with up-to-date information; the Secretariat has also counted on the co-operation of correspondents at other international organisations such as the International Atomic Energy Agency and the European Commission for information on actions or activities in their spheres of interest that could impact the nuclear law community.

Probably the most visible of changes that occurred while I was editor of the NLB was in the design and colour of its cover – from a strong orange background with only the title and number of the edition in black to a more muted white background with grey details that was more in keeping with the times and certainly with the "new look" of all NEA publications, which became colour coded according to the work area of the publication. The choice of grey as the contrast colour was mine alone, however.

Another change was the cessation of the NLB companion known as the "Supplement", which, since the NLB's inception, contained the texts of nuclear law acts or regulations in countries worldwide with a focus on those of NEA member countries; those texts were simply incorporated into the body of the NLB itself under the section that is now called "Documents and Legal Texts". A further change was the inclusion of tables indicating international participation in various conventions and agreements in the nuclear field, which we tried to keep as up-to-date as possible.[1]

1. I note that in the NLB's continuing evolution with technology, the table on multilateral agreements was transitioned to the NEA's website in 2014 with NLB No. 94 (www.oecd-nea.org/law/multilateral-agreements).

I would like to take this opportunity to express my gratitude to, and admiration of, all those who have worked so arduously over the years to create, maintain and enhance this most useful publication and to congratulate the members of the NEA Office of Legal Counsel on producing an outstanding 100th issue in celebration of the NLB's 50th anniversary.

Stephen G. Burns

Former Head, NEA Legal Affairs (2011-2014)

My first engagement with the *Nuclear Law Bulletin* (NLB or *Bulletin*) was as an author and correspondent. I had followed for some time the reporting in the NLB on national and international developments in nuclear law and became the correspondent to the NLB for the US Nuclear Regulatory Commission (NRC) in 2007, long before I contemplated the move to Paris to work for the Nuclear Energy Agency (NEA). I had come to know two of my predecessors as Head of Legal Affairs for the NEA, Patrick Reyners and Julia Schwartz, through the International Nuclear Law Association (INLA) and the Inter Jura congresses in Portorož, Slovenia, and Brussels, Belgium. With Julia's encouragement, I contributed an article in 2008 reviewing the changes in the licensing process for new reactors in the United States.[2] While I hoped that my article would help an international audience understand the process and challenges we faced in licensing in the United States, I found the experience of writing deepened my own understanding of the history, political debate, technical considerations and legal approaches that had shaped the approach to licensing nuclear installations in the United States since the advent of civilian nuclear power in the 1950s. With the encouragement of my former colleagues at the NEA, I recently published a reflection on my earlier piece in light of the budding enthusiasm for advanced reactor development and the demand in some quarters for further regulatory reformation.[3]

My experience as a contributor to the *Bulletin* certainly helped prepare me for the responsibility of pulling together and publishing new issues when I arrived in Paris in April 2012. What impressed me is that the work of putting out a new edition of the NLB was accomplished with minimal resources, yet the quality and relevance of the NLB to nuclear law was high. The work was handled largely by just three of us in Legal Affairs: a lawyer to solicit and manage the content, an administrative staffer to hammer out the manuscript into publishable form, and me as, effectively, the editor-in-chief to review the content and approve publication.

Our job entailed more than merely sitting back and waiting for reports on new legal developments or articles to arrive on our desks. We actively communicated with our list of correspondents on their reports or about new legal texts from their countries that would be worth sharing with a larger audience. We sought clarification to ensure our readership would understand the context of their reports and worked through questions on the accuracy of translations of their reports or legislative texts into English or French. With the authors of articles, we took a hard look at the sources relied upon as well as the substance of each article; suggested changes for

2. Burns, S. (2008), "Looking Backward, Moving Forward: Licensing New Reactors in the United States", *Nuclear Law Bulletin*, No. 81, OECD, Paris, pp. 7-29.
3. Burns, S. (2017), "Reformed and reforming: Adapting the licensing process to meet new challenges", *Nuclear Law Bulletin*, No. 99, OECD, Paris, pp. 7-30.

the author to clarify or expand upon; and worked the article into the editorial style necessary to achieve consistency with the *Bulletin*'s overall presentation, content and citation format. This was no small task, and I can recall some vigorous debates and negotiations with authors. Our objective was to ensure that the articles reflected the author's voice but at the same time met our publishing standards.

Accurate translation was one of my biggest concerns and challenges. For a number of languages – obviously French and English but also some others – we had native speakers on staff (though I had to adjust my spelling to British English to meet OECD publishing requirements – something I still tend to do even now to the puzzlement of my colleagues here in the United States!). I give high praise to our correspondents who submitted their reports in English or French when those were not their native languages, and I appreciated their patience and effort with us to prepare their contributions for publication. I used to say that I was a dabbler in many languages but a master of none as I tried to work through our correspondents' reports, legal texts and articles, and ensure that what we published was as true as it could be to the intention of the authors and the original legal texts. In a number of instances, such as the publication of legal texts related to the Japanese liability and compensation system, we enjoyed the active support of Japan's mission to the OECD in obtaining translations of key documents that supported publication in the *Bulletin* as well as our special publication *Japan's Compensation System for Nuclear Damage*.[4]

In reflecting on the content of the *Nuclear Law Bulletin*, I would suggest that the most important material falls, in no particular order, into three categories: 1) reports on case law, legislative and regulatory developments; 2) original legal texts or documents issued by countries or multilateral organisations; and 3) the articles submitted by practitioners, scholars and experts on nuclear law topics. The first two categories have been at the core of the content of the *Bulletin* from its earliest days. In looking back at the issues for which I was responsible during my time at the NEA, I noted that 35 countries submitted reports or texts to be published in the *Bulletin* in addition to contributions from the NEA, the International Atomic Energy Agency and the European Atomic Energy Community. Importantly, the submissions covered countries engaged across the range of issues relevant to the use of nuclear energy and radioactive materials, whether the safety of nuclear power plants, radioactive waste management, security of radioactive sources, liability and compensation, government infrastructure, or national policies for new build or disengagement from nuclear power programmes.

Each issue of the *Nuclear Law Bulletin* reflects the *Zeitgeist* of nuclear law – as it should. Nowhere is this more evident than in the articles published in each issue, which may not only discuss the state of the law, but also may provide a vision of how we can improve the framework for the safe use of nuclear energy and radioactive material. In my time at the NEA, the major issues in nuclear law focused primarily on improving the assurance of nuclear safety in the aftermath of the Fukushima Daiichi nuclear power plant accident; the heightened focus on the nuclear liability and compensation regimes resulting from the accident; progress by countries pursuing new nuclear energy production; and a continued emphasis on security and safeguards obligations. The articles in the *Bulletin* for which I was responsible (NLB Nos. 89-94) reflected these themes, and we were able to share the thinking and insights of officials with international and national organisations, lawyers who were engaged in their day-to-day work with the practical implementation of international and national instruments, and scholars who addressed the complexities – and sometimes the follies or failings – of the legal system.

4. NEA (2012), *Japan's Compensation System for Nuclear Damage as Related to the TEPCO Fukushima Daiichi Nuclear Accident*, OECD, Paris.

Publishing the *Nuclear Law Bulletin* was among the most satisfying of my responsibilities during my time as Head of Legal Affairs. We produced a tangible product of our work at the NEA, something that was not always easy to achieve in our other work supporting the NEA committees, where it might take us years to achieve consensus on particular policies. Moreover, the *Bulletin* remains important as a clearinghouse for developments in nuclear law and for thinking about where the law is headed or needs to be directed. It is the only journal that brings together the global community on nuclear law. I am proud of the work that my predecessors as well as my colleagues did and that the current staff does to produce this important journal. Let another 100 issues bloom!

Ximena Vásquez-Maignan

Head, NEA Office of Legal Counsel (2014-present)

When I took up the position as Head of the NEA Office of Legal Counsel (OLC) after several years as a Senior Legal Adviser, I knew that I would have the responsibility of ensuring that the *Nuclear Law Bulletin* (NLB) continues to be one of the NEA's most read publications and to carry on the unbroken tradition of high standards set up by my predecessors. The current OLC team has big shoes to fill!

As mentioned in the foreword of the first issue, at the time the NLB was launched, construction of nuclear power plants was increasing and the need to create an appropriate legal framework, at national and international levels, for this new industrial activity was crucial. Providing up-to-date information on legislative and regulatory activities, case law and administrative decisions, international organisations and agreements, as well as texts of national legislation was an excellent initiative to assist the then-European Nuclear Energy Agency member and non-member countries. After 50 years, this work remains just as critical.

While the "nuclear renaissance" of the early 2000s did not necessarily come to pass, reactors continue to be built and "newcomer" countries continue to launch new nuclear power programmes. Evolutionary and revolutionary reactor designs are being developed, constructed and considered around the world. Some, like small modular reactors and floating nuclear power plants, were not foreseen when the international conventions were drafted. Skilled legal experts will be needed to respond to new legal challenges but also to address outstanding legal questions. This is true as well for countries that have decided to maintain nuclear power programmes, and possibly consider extending the lifetime of certain reactors, or to phase-out others. Questions regarding decommissioning and the management of spent fuel and radioactive waste will require substantial legal and technical expertise. Regardless of whether a country is ramping up or slowing down or just preserving the status quo, there are still many challenging legal issues around nuclear energy.

Several generations of nuclear lawyers have already gone by and as mentioned by Carlton Stoiber in his article, it will soon be time for the lawyers who participated in the post-Chernobyl drafting of international nuclear instruments "to pass the torch onto the next generation". Countries, whether nuclear or not, as well as the nuclear industry will need to encourage and train the future generations of nuclear law experts. Maintaining a stable force of knowledgeable, inquisitive and dedicated nuclear lawyers is critical not only at a national level, but also at an international level. Without these nuclear law experts, the legal framework required for "a safe,

environmentally sound and economical use of nuclear energy"[5] will have difficulties to adapt and evolve.

The initial purpose of the NLB is therefore more relevant than ever. We must continue to provide easy access to information on legal developments in the nuclear field that take place around the world to learn from each other. We must enable students, lawyers and policymakers to confront issues by providing analytical articles by experts from governments, academia, international organisations and the private sector to contribute to the development, strengthening and harmonisation of nuclear legislation worldwide. And we must strive to ensure that the NLB remains a reliable, accessible and valuable source of information, with the assistance of all the NEA member countries and the many correspondents worldwide.

5. NEA (2016), *The Strategic Plan of the Nuclear Energy Agency: 2017-2022*, OECD, Paris, p. 15.

Commentaries on the *Nuclear Law Bulletin*

100 issues of the *Nuclear Law Bulletin*

by Roland Dussart-Desart[*]

The *Nuclear Law Bulletin* (NLB) is celebrating its 100th issue in fifty years. By the grace of our decimal system and its bountiful roundness, number 100 strikes the imagination, arouses admiration, gives cause for celebrations and mutual congratulations. Let's not deny ourselves this pleasure!

The NLB is not only an exemplary model of regularity, as illustrated by a remarkable consistency in substance and a subtle evolution in form, but it now occupies a place in the field of law that reflects the legal aspects of the domain it comments upon and describes. Indeed, beyond the studies, controversies and considerations of news issues, what other branch of law has its experts worrying about the fate of humankind in the millennia to come, or dealing with subjects and concepts so technical as to put off lawyers normally more versed in social sciences?

Contrary to a growing number of publications, the NLB has happily survived the dematerialization process. This should not be seen as a symptom of the conservatism sometimes ascribed to the discipline that the NLB inspires and describes. A printed book will always be a better tool for comparison and reflection than a virtual tool. And yet, given nuclear law's international and transboundary aspects, it is also a subject matter that demands a detailed reciprocal understanding of institutions and legal regimes applicable in different countries.

The contributors to this series of tributes detail the history and evolution of the NLB; no need for me to dwell on these. I would rather add a forward-looking perspective. Could the table of contents of each issue not be mentioned at the Nuclear Law Committee (NLC)? Would it not be beneficial for the NLB to adopt a less austere presentation? Don't the newest aspects of nuclear law deserve more attention, as reflected by the creation of new working groups under the auspices of the NLC? Many avenues could be explored by authors, including radioactive waste repositories, transport, legal aspects of nuclear safety or decommissioning. Indeed, there are enough topics to fill more than 100 additional issues.

* Roland Dussart-Desart is the Head of the Legal Division of the Belgian FPS (Ministry) dealing with Economy, SMEs, Self-Employed and Energy. His first participation in the Nuclear Energy Agency's (NEA) Nuclear Law Committee (NLC) took place in 1987. He was elected Vice-Chairman of the NLC in 2002 and has served as the Chairman of the NLC since 2003.

The *Nuclear Law Bulletin*: Source of informing on, and instrument of developing, nuclear law

Hommage à un journal juridique

by Norbert Pelzer[*]

> The Nuclear Law Bulletin is a unique international publication for both professionals and academics in the field of nuclear law. It provides readers with authoritative and comprehensive information on nuclear law developments. Published free online twice a year in both English and French, it features topical articles written by renowned legal experts, covers legislative developments worldwide and reports on relevant case law, bilateral and international agreements as well as regulatory activities of international organisations.

This description found on the back of every edition of the *Nuclear Law Bulletin* (NLB) since 2010[1] reveals an officially propagated and proud self-conception by the NLB's publishers and editors that it is "a unique international publication". This, indeed, is a demanding assessment. But is it justified?

I.

Nuclear law is a branch of law where national and international law form a symbiosis. National nuclear legislation is strongly influenced or even governed by international instruments while, on the other hand, international law is a result of its state lawmakers. Due to the potential detrimental transboundary effects of nuclear incidents, internationalisation is a basic feature of nuclear energy[2] and this applies to nuclear law, too. It follows that a journal designed to provide "authoritative and comprehensive information on nuclear law developments" has to deal with the national and international aspects of nuclear law. In particular, the interaction of these fields of law requires reliable information and analysis on the comparative aspects of nuclear law. The publishers of the NLB have been aware of this situation from the beginning.

The first edition of the NLB was published in February 1968. Its original Foreword reads, in part:[3]

> The increasing number of nuclear installations now being commissioned, often for industrial operation, has given rise to problems of growing importance in the application of nuclear law. In various countries, laws and regulations are being prepared or revised. Generally, these texts are designed to interpret and apply, on a national basis, the uniform rules and recommendations which have been adopted internationally. It would be unfortunate if their implementation, which obviously depends on particular national circumstances, should result in maintaining or aggravating the differences which were meant to be avoided.

* Norbert Pelzer, Dr. jur. (Göttingen); Consultant; retired Academic; Institute of Public International Law; University of Göttingen, Germany; former Honorary Lecturer at the University of Dundee, Scotland.

1. Earlier descriptions differed slightly in the wording but not the substance. See e.g. NEA (2005), *Nuclear Law Bulletin*, No. 75, OECD, Paris.
2. Pelzer, N. (2013), "Safer nuclear energy through a higher degree of internationalisation? International involvement versus national sovereignty", *Nuclear Law Bulletin*, No. 91, OECD, Paris, pp. 43-88, 45.
3. NEA (1968), *Nuclear Law Bulletin*, No. 1, OECD, Paris, p. 5.

> Therefore it seems useful to provide as much information as possible, to administrative and industrial circles, on legislation and case law in other countries having the same interests and similar concepts, as well as on the work of international organisations. This information should facilitate the continuing efforts for harmonisation which remain necessary.

This introduction of the new publication clearly underlines that the focus of the journal will be a comparative view on national legislations and on the work of international organisations including relevant public international law sources. It thus contributes to facilitating "the continuing efforts for harmonisation which remains necessary." In implementing this concept, NLB No. 1 contains legislative and case law reports from the following counties: Austria, Belgium, France, Germany, Italy, Luxembourg, Norway, Spain, Sweden and the United States. This overview is complemented by activity reports of the European Atomic Energy Community (Euratom), the European Nuclear Energy Agency (ENEA) (the predecessor of the Nuclear Energy Agency (NEA)) and the International Atomic Energy Agency (IAEA). Finally, the issue reproduces an English translation of a French law while the Supplement to NLB No. 1 reproduces the 1965 UK Nuclear Installations Act and an English translation of the draft Norwegian Act on Uses of Atomic Energy.

The first issue of the NLB was therefore completely dedicated to exact and detailed information on national nuclear law developments. To collect the necessary information, the publishers recruited national correspondents from ENEA member and non-member countries. Building on national correspondents supports the reliability of the information provided, which therefore may be called quasi-authoritative. The 1968 list of correspondents comprises experts from 16 countries and 2 international organisations.[4] Today, that list has grown to include correspondents from 58 countries and 2 international organisations.[5] This represents a truly impressive basis for information from around the world.

II.

With issue No. 5 (1970), the NLB made a decisive step to change from a merely reporting journal to a forum of scientific discussion: the list of contents was augmented by a permanent chapter "Studies and Articles", which was placed at the end of the respective issue.[6] This formula was quickly accepted by the international community of nuclear lawyers. Of course, there were already other journals that published nuclear law articles and commentary, but they were all more or less restricted to national legal problems. Moreover, none was exclusively designed to deal with nuclear law. Thus, the new discussion medium was most welcome.

Among the first authors to be included in the new chapter were José María Lopez Olaciregui from Argentina (NLB No. 5, 1970); Poul A. Spleth from Denmark and Hans Fischerhof from Germany (NLB No. 6, 1970); Alfonso De Los Santos Lasurtegui from Spain (NLB No. 7, 1971); Jean-Claude Mayoux from France (NLB No. 8, 1971); Raffaele Albano, Fabrizio Nocera and Ferdinando Carbone from Italy (NLB No. 9, 1972); and Josef K. Pfaffelhuber from Germany (NLB No. 10, 1972). As of NLB No. 43 (1989), the chapter "Studies and Articles" was visibly upgraded by its move from the end of the issue to the beginning. The chapter now forms the main eye-catcher for the reader. By the end of 2017, 25 studies and 196 articles have been included in this section.[7] A total of 176 authors have presented their views on defined problems, thus contributing to further evolution of nuclear law.

4. NEA (1968), *Nuclear Law Bulletin*, No. 2, OECD, Paris, p. 5.
5. NEA (2017), *Nuclear Law Bulletin*, No. 99, OECD, Paris, pp. 117-119.
6. According to the Foreword to NLB No. 5, this new section is to contain "articles where legal problems concerning nuclear energy will be discussed, and points of doctrine explained." NEA (1970), *Nuclear Law Bulletin*, No. 5, OECD, Paris, p. 3.
7. NEA (2017), *Nuclear Law Bulletin Index: Nos. 1 to 99*, OECD, Paris, pp. 269-282.

The combination of the chapter on "Studies and Articles" with the chapters on reports of national legislations and international treaty making provide an abundance of information on the entire field of nuclear law on a regular basis.

III.

The publishers and editors of the NLB classify the material published in accordance with a permanent scheme that facilitates quick access to the information needed.

The main key to make accessible the national reports is the "classification by country", which currently covers 103 countries and is supplemented by a list of 18 international organisations.[8] This main structure is refined by a sub-classification: legislative and regulatory activities; case law; administrative decisions; and agreements. The topic "legislative and regulatory activities" obviously is most important, and it is therefore further sub-divided as follows:

- environmental protection;
- food irradiation;
- general legislation, regulations and instruments;
- international co-operation;
- liability and compensation;
- licensing and regulatory infrastructure;
- nuclear installations;
- nuclear safety and radiological protection (including nuclear emergency planning);
- nuclear security;
- nuclear trade (including non-proliferation);
- nuclear-powered ships;
- organisation and structure;
- radioactive materials (including physical protection);
- radioactive waste management; and
- transport of radioactive materials.[9]

A nearly identical sub-division applies to the chapter "Articles".[10]

IV.

The detailed classification of the chapters of the NLB emphasises the journal's demand to fully cover all aspects of nuclear law. The numbers of articles listed under the respective chapter demonstrate where the main focus of the authors is. At the top of the authors' interest are:

- liability and compensation: 51 articles;
- nuclear trade (including non-proliferation): 31 articles;

8. *Ibid.*, pp. 5-8.
9. *Ibid.*, pp. 11.
10. *Ibid.*, pp. 271-282.

- general legislation, regulations and instruments: 29 articles;
- nuclear safety and radiological protection (including nuclear emergency planning): 23 articles.

This ranking is not surprising because the chapters deal with core issues of nuclear law. On the other hand, it does surprise that the chapter "Transport of radioactive materials", which is of highest practical interest, attracted only one author to deal with this subject.[11] However, transport is dealt with probably in other chapters.

V.

2018 is the year of the NLB's 50th anniversary. The colleagues of the European Nuclear Energy Agency who founded the NLB in 1968 equipped the new journal with a stable basis and an appropriate structure that from the beginning until today provide an excellent forum to introduce and to discuss advanced nuclear law problems. In particular the international background of the journal satisfies the requirements of the internationalisation of the use of nuclear energy. The NLB is a useful and necessary tool of information for nuclear lawyers, and at the same time it is a privilege to publish in the journal. Indeed, the NLB is "a unique international publication".

11. Sousa Ferro, M. (2006), "Right of innocent passage of ships carrying ultra-hazardous cargoes", *Nuclear Law Bulletin*, No. 78, OECD, Paris, pp. 7-18.

NUCLEAR LAW BULLETIN No. 100

Legal challenges to the operation of nuclear reactors in Japan

by Hiroyuki Hase[*]

I. Introduction

In the aftermath of the accident that occurred at the Tokyo Electric Power Company (TEPCO) Fukushima Daiichi nuclear power plant (NPP) on 11 March 2011 (hereinafter referred to as the "Fukushima Daiichi NPP accident"), the Japanese Nuclear Regulation Authority (NRA) amended the regulatory standards for nuclear reactors based on the lessons learnt from the accident. All the reactors in Japan were shut down and they are allowed to restart operations only after the NRA has reviewed their conformity to the new regulatory standards. As of April 2018, seven reactors have completed all the necessary safety reviews and inspections, and have restarted their operations. However, local residents sought injunctions to stop the operation of these reactors, which were approved by some lower courts.[1] This is a remarkable change considering the fact that in the over 50 years of commercial use of nuclear energy prior to the Fukushima Daiichi NPP accident, there were only two instances where a Japanese court revoked the construction licence for a nuclear reactor or granted an injunction against operation. Thus, in Japan, the operation of nuclear power reactors is significantly impacted by not only the licensing process but now also by the judicial process.

Nevertheless, the court decisions on judicial challenges to the operation of nuclear reactors in Japan have not been widely reported internationally. In Japan, legal challenges to the operation of nuclear reactors involve two types of cases: administrative and civil. Plaintiffs may sue the government to revoke its licensing decision in administrative cases; in civil cases, they may sue the operator to shut down its reactor. Both types of cases play an important role in judicial challenges. And while in both administrative and civil cases the courts have only on the rarest occasion granted injunctions against the operation of nuclear reactors, some lower courts have begun to question the safety of nuclear reactors in civil cases after the Fukushima Daiichi NPP accident. These decisions show examples where a severe accident has had an impact on judges' attitudes towards the operation of nuclear reactors.

Although the particularities of natural hazards in Japan (e.g. earthquakes, tsunami and volcanos) are often major factors in court decisions, this article focuses on two issues: (1) how all citizens are ensured access to the courts and (2) how judges, who are legal rather than technical experts, review the licensing decisions or safety of nuclear reactors, a subject that requires a deep understanding of nuclear technology. Section II provides an overview of the regulations for the construction and operation of nuclear reactors, which is necessary to understand the court

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1. Lower courts include both district courts and high courts. The highest court and court of final instance in Japan is the Supreme Court.

decisions.[2] Section III summarises the legal framework concerning access to the courts in both administrative and civil cases. Sections IV and V describe the standards of judicial review applied to licensing decisions and safety of nuclear reactors. Although the Supreme Court established its standards of judicial review in administrative cases, it has not yet handed down any important decision in a civil case. Accordingly, lower court decisions are split in civil cases: some courts follow the approach in administrative cases, while others do not, particularly after the Fukushima Daiichi NPP accident. Section IV first describes the Supreme Court's standards of review for administrative cases and then Section V shows the different approaches in civil cases.

II. Overview of the nuclear safety regulations

1. *Safety regulation authority*

Before the Fukushima Daiichi NPP accident, the Ministry of Education, Culture, Sports, Science and Technology (MEXT) and the Ministry of Economy, Trade and Industry (METI), whose missions included both the promotion and regulation of nuclear energy, were responsible for issuing licences for nuclear installations. The Nuclear Safety Commission (NSC), under the Cabinet Office, provided technical opinions concerning regulatory activities to the MEXT and METI. The Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors[3] provided that the NSC's opinions should be respected by the ministers. Before the establishment of MEXT, METI and the NSC, the Prime Minister (as head of the Science and Technology Agency) was responsible for safety regulation, and the Atomic Energy Commission (AEC) and the Reactor Safety Examination Committee (RSEC) under the AEC provided technical opinions.

However, in 2012, following the Fukushima Daiichi NPP accident, the Act for Establishment of the Nuclear Regulation Authority[4] was enacted to establish the NRA. While affiliated with the Ministry of Environment, the NRA is classified as an organisation under Article 3 of the National Government Organisation Act,[5] which means it enjoys the same status as other ministries. This status allows the NRA to be removed from any ministers' control and to make its own, independent decisions. The NRA's executives are composed of a Chairman and Commissioners who can be dismissed only on limited grounds[6] and who perform their duties independently.[7] However, the Cabinet and the Diet exercise some control over the NRA: the Chairman and Commissioners are appointed by the Prime Minister, subject to approval by the Diet;[8] the Cabinet decides the budget proposals, including the NRA's budget, and submits related legislation to the Diet;[9] and the human resource management of NRA officials is subject to the control of the Cabinet Bureau of

2. For more detail about nuclear safety regulation in Japan, see NEA (2017), Nuclear Legislation in OECD and NEA countries: Japan, Regulatory and Institutional Framework for Nuclear Activities, available at www.oecd-nea.org/law/legislation/japan.pdf.
3. Act on the Regulation of Nuclear Source Material, Nuclear Fuel Material and Reactors, Act No. 166 of 10 June 1957 (Regulation Act). An English translation of the Regulation Act is available at: www.nsr.go.jp/data/000067232.pdf.
4. Act for Establishment of the Nuclear Regulation Authority, Act No. 47 of 27 June 2012 (NRA Establishment Act). An English translation of the NRC Establishment Act is available at: www.nsr.go.jp/data/000067231.pdf.
5. National Government Organisation Act, Act No. 120 of 10 July 1948.
6. NRA Establishment Act, *supra* note 4, Articles 7 and 9.
7. *Ibid.*, Article 5.
8. *Ibid.*, Article 7.
9. National Government Organisation Act, Article 11; Public Finance Act, Act No. 34 of 1947, Articles 17 and 18.

Personnel Affairs and other regulations. Thus, while the NRA enjoys independence from other ministries, it is subject to some control by the Cabinet and Diet.

Following the establishment of the NRA and the amendments to the relevant laws, MEXT, METI and the NSC lost their power over safety regulations and the NRA now assumes all responsibility. The licences issued by MEXT and METI prior to the establishment of the NRA are deemed to have been issued by the NRA,[10] and therefore the NRA must respond to litigation concerning such licences.

2. Safety regulation procedures

The Regulation Act provides the legal framework for nuclear installation safety regulation. This Act covers the construction, operation and decommissioning of nuclear reactors as well as other activities, such as nuclear fuel fabrication, enrichment, reprocessing and radioactive waste disposal. Since the Regulation Act provides almost identical procedures for nuclear power reactors and other activities, and most of the court decisions concern nuclear power reactors, the following paragraphs describe the regulations concerning nuclear power reactors.

A person who intends to construct a nuclear power reactor must submit an application to the NRA and obtain a licence. The NRA must not issue a construction licence unless it finds that the application conforms to all of the following items:

(i) the reactor shall not be utilised for non-peaceful purposes;

(ii) the applicant shall have sufficient technical capability and the financial basis necessary for constructing the reactor;

(iii) the applicant shall have the technical capability required for taking measures necessary for preventing the occurrence and expansion of a severe accident and has other technical capabilities sufficient for operating the power reactors properly;

(iv) the location, structure and equipment of the nuclear reactor shall conform to the standards specified by the Ordinances of the NRA so that they are able to prevent disasters resulting from the reactor, nuclear fuel or material contaminated by nuclear fuel.[11]

Following the granting of the construction licence, the detailed design and construction methods must be approved by the NRA.[12] Then, once the reactor has passed the inspections, it may commence operations.[13] During operation, the reactors must pass periodic inspections.[14] Where there are any changes to the basic design, the operator must obtain a permit for the change.[15] In addition to the regulations on facilities, the operator must obtain approval for operational safety programmes (including safety education on operation of the reactor, self-inspections on welding and periodic self-inspections) and undergo a periodic inspection by the NRA to determine compliance with the safety programmes.[16] Before a reactor is decommissioned, the decommissioning plan must be approved by the NRA.[17]

10. NRA Establishment Act, *supra* note 4, Article 3 of the supplementary provisions.
11. Regulation Act, *supra* note 3, Article 43-3-6.
12. *Ibid.*, Article 43-3-9.
13. *Ibid.*, Article 43-3-11.
14. *Ibid.*, Articles 43-3-15 and 43-3-16.
15. *Ibid.*, Article 43-3-8.
16. *Ibid.*, Article 43-3-24.
17. *Ibid.*, Article 43-3-33.

After the Fukushima Daiichi NPP accident, the NRA established new regulatory standards and strengthened safety requirements.[18] The amended Regulation Act clearly stipulates the operators' obligation to maintain reactors so that they conform to the latest technical standards[19] and the NRA's authority to order suspension of reactor operations or other necessary measures in case of any breach of this obligation.[20] According to these amendments, no reactor is allowed to operate unless it conforms to the latest technical standards. The operators must strengthen safety measures to conform to the new safety requirements and go through the permit process for basic design change, approval of detailed design and construction methods, approval of the amended operational safety programmes, and inspections. Reactor operations must be suspended during all of these procedures and the reactors are allowed to resume operations only after their completion. As of April 2018, seven reactors have been authorised to restart operations.[21] Though, as described in Section V, the restarting of operations is being challenged in recent civil cases.

In addition, according to the amended Regulation Act, power reactors may operate for 40 years, and this period may be extended only once and only up to 20 years by obtaining the NRA's approval.[22] The approvals have been granted to three reactors as of April 2018, though there is no court decision yet on this issue.

3. *Public participation*

There is no specific legal framework for public participation in the construction and operation of nuclear reactors. However, according to Supreme Court decisions, the lack of a legal framework for public participation does not constitute a breach of the Constitution. The Supreme Court stated:

> … even in the case where the guarantee under … Article [31 of the Constitution][23] should be considered to be applicable, since administrative procedures are generally different from criminal procedures in nature and vary greatly depending on the administrative purposes, whether or not it is necessary to provide a party subject to an administrative disposition with an opportunity to receive a prior notice, provide an explanation, or raise a defense should be determined by comprehensively comparing various factors including the content and nature of the right or interest to be restricted by the administrative disposition, the extent of the restrictions, and the content,

18. *Ibid*., Article 43-3-6, para. 1, item 4 and Article 43-3-14. Based on these provisions, the NRA amended the Ordinance concerning the Installation, Operation, etc. of Commercial Nuclear Power Reactors (Ordinance of Ministry of International Trade and Industry No. 77 of 1978) and other related regulations.
19. Regulation Act, *supra* note 3, Article 43-3-14.
20. *Ibid*., Article 43-3-23.
21. In addition, another seven reactors have already been granted permits and are now under the subsequent reviews and inspections as of April 2018.
22. Regulation Act, *supra* note 3, Article 43-3-32.
23. Article 31 provides as follows: "No person shall be deprived of life or liberty, nor shall any other criminal penalty be imposed, except according to procedure established by law." This article ensures due process of criminal procedure, but it is understood that Article 31 also applies to administrative procedure. On this point, the Supreme Court stated: "The guarantee of due process of law prescribed in Article 31 of the Constitution directly pertains to criminal procedures. However, it is inappropriate to consider that all administrative procedures are automatically excluded from the scope of the guarantee under said Article just because they are not criminal procedures." Supreme Court decision of 1 July 1992, *Minsyu*, Vol. 46, No. 5, p. 437 (New Tokyo International Airport Supreme Court decision). *Minsyu* is the legal reporter for Supreme Court decisions. A provisional translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=1464 (accessed 4 May 2018).

> degree, urgency, etc. of the public interest that the administrative disposition aims to protect. Therefore, it is appropriate to construe that such opportunity is not always required to be provided.[24]

Although the case in question concerned an administrative procedure for a recipient of an administrative decision, it is understood to be a general rule of administrative procedure. Citing this decision, the Supreme Court decision on the construction licensing for the Shikoku Electric Power Company's Ikata NPP stated:

> The examination as to whether or not an application for permission for installation of reactors meets the criteria prescribed in the items of Article 24, paragraph (1) of the Regulation Act requires a considerably high level of expert technical assessments relating to the conformity to the plan on development and use of reactors and the safety of reactor facilities. Accordingly, paragraph (2) of said Article provides that when granting such permission, it is necessary to hear the opinion of the Atomic Energy Commission, which consists of persons with knowledge and experience in the relevant specialized fields, and respect such opinion. In view of this, although the Basic Act [on Atomic Energy] and the Regulation Act do not provide for procedures to allow residents living near the planned site of reactors to participate in the reactor installation permission procedures, or the disclosure of applications for installation and other documents, it cannot be said, only because of this fact, that these two Acts are contrary to the legislative purpose of Article 31 of the Constitution. Nor can it be said that it is contrary to the legislative purpose of said Article that the appellants, who are residents living near the planned site, were not given the opportunity to receive notice and be heard during the process of issuing the administrative disposition to grant permission for the installation of reactors disputed in this case.[25]

Following this decision, public participation in the licensing of nuclear reactors has not been a major issue in court decisions.

Regardless of the fact that public participation is not required by law, public participation procedures in the licensing process for nuclear reactors are implemented in practice. Public hearings are organised by the government and the operator before issuing a construction licence, and the operators must disclose information about their NPPs. In addition, agreements exist between the operators and municipalities or prefectures where the nuclear reactors are located whereby operators must obtain the consent of the municipalities and prefectures before resuming operation of a nuclear reactor following a basic design change or unexpected shutdown caused by certain incidents. The consents are often preceded by debates at local assemblies or discussions with local residents. These agreements are not based on any legal framework and there is no established conclusion as to their enforceability. Nevertheless, they are considered to be an important vehicle to facilitate the understanding of the local people and these agreements play a significant role in the operation of nuclear reactors. Based on the agreements, operators must obtain the consent of municipalities and prefectures before resuming operations following basic design changes to meet the new regulatory standards after the Fukushima Daiichi NPP accident. Various issues, including the strengthened safety measures and evacuation plans, are discussed in this process, which usually takes considerable time.

24. New Tokyo International Airport Supreme Court decision, *supra* note 23.
25. Supreme Court decision of 29 October 1992, *Minsyu*, Vol. 46, No. 7, p. 1174 (Ikata Supreme Court decision). A provisional translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=1399 (accessed 4 May 2018).

Disclosure requirements applicable to governmental bodies also apply to national research institutes (e.g. the Japan Atomic Energy Agency), but not electric power companies, all of which are private companies. Although 50% of the shares in TEPCO are owned by the Nuclear Damage Compensation and Decommissioning Facilitation Corporation,[26] this ownership does not affect the scope of the disclosure requirements, which do not apply to TEPCO.

III. Access to the courts

Although administrative courts existed before World War II, no extraordinary court can be established under the present Constitution (Article 76, paragraph 2), which means that only one single court system exists. And this court system handles all cases concerning public and private law. District courts, high courts and the Supreme Court have jurisdiction for both civil and administrative cases as, respectively, the courts of first, second and final instance.[27] The Code of Civil Procedure[28] applies to both civil and administrative cases, and the Administrative Case Litigation Act[29] provides for some specific matters.[30]

1. *Administrative cases*

i) Procedure

Litigation to challenge licensing decisions may include several types of actions, among which are actions for revocation and declaration of nullity of administrative decisions. These two actions are the most widely used to challenge the licensing of nuclear reactor construction.

In administrative cases, the defendant is not an individual ministry but rather the Japanese Government or a local government entity that has jurisdiction over the administrative decision in question.[31] The Japanese Government is the defendant in cases where licensing decisions for nuclear reactors are challenged, since the NRA is responsible for the decision. Although individual ministries/agencies were once the defendants, this provision was amended to decrease the burden on plaintiffs to identify the responsible ministry/agency, which is not always clear for citizens. The officers of the Ministry of Justice and the responsible ministry/agency represent the Japanese Government in the proceedings.

The court of the district where the administrative body that made the decision is located has jurisdiction in the first instance. Where the Japanese Government is the defendant, jurisdiction can also be based on the location of plaintiff's general venue (i.e. domicile).[32]

26. Act on Compensation for Nuclear Damage, Act No. 147 of 17 June 1961 (Compensation Act).
27. Only these three types of courts have jurisdiction over the actions for revocation of administrative decisions or actions for injunction based on personal rights; summary courts and family courts do not.
28. Code of Civil Procedure, Act No. 109 of 26 June 1996.
29. Administrative Case Litigation Act, Act No. 139 of 16 May 1962.
30. English translations of Japanese laws are available at the Ministry of Justice's website at: www.japaneselawtranslation.go.jp.
31. Administrative Case Litigation Act, *supra* note 29, Article 11, para. 1.
32. *Ibid.*, Article 12, para 4. In Japan there are eight high courts in eight different locations (Fukuoka, Hiroshima, Nagoya, Osaka, Sapporo, Sendai, Takamatsu and Tokyo). In contrast, there are 50 district courts with at least 1 in each of the 47 different prefectures in Japan. Thus, each high court has jurisdiction over multiple district courts. In this instance, a plaintiff can bring suit in the district court for the prefecture where the high court that has jurisdiction over the plaintiff's domicile is located.

The action for revocation of an administrative decision means an action seeking revocation of an administrative decision[33] when it involves any illegality. Any action for revocation of an administrative decision must be filed within six months of the day on which the person who seeks revocation became aware of the fact that the administrative decision was made; or within one year of the date of the administrative decision.[34] An action for declaration of nullity[35] can be filed when the administrative action in question involves a serious breach of administrative laws and such illegality is obvious.[36] Actions for declaration of nullity can be filed at any time (i.e. without any time limits).

A person may request the administrative agency to review its decision under the administrative appeal procedure.[37] However, an action for revocation or declaration of nullity of an administrative decision can be filed without going through the administrative appeal procedure, unless otherwise specified in the related laws.[38] Since the Regulation Act does not preclude the immediate filing of actions concerning construction licensing, the actions can be filed without going through the administrative appeal procedure.

In addition to revocation and declaration of nullity, the following types of actions and provisional orders are provided by the 2004 amendment to the Administrative Case Litigation Act: mandamus action; action for injunctive order; provisional order of mandamus; and provisional injunctive order. They are expected to be used when the regulatory authority does not exercise its power or before the regulatory authority makes its decision. However, these types of action have not been used effectively so far since their conditions are quite limited.[39]

ii) Standing to sue

An action for revocation of an administrative decision may be filed only by "a person who has legal interest" in seeking the revocation,[40] which the court judges taking

33. *Ibid*., Article 3, para. 2.
34. *Ibid*., Article 14.
35. *Ibid*., Article 3, para. 4.
36. Supreme Court decision of 22 September 1959, *Minsyu*, No. 13, Vol. 11, p. 1426.
37. Administrative Appeal Act, Act No. 68 of 2014.
38. Administrative Case Litigation Act, *supra* note 29, Article 8, para. 1.
39. "Mandamus action": An action seeking an order to require an administrative agency to make a specific administrative decision when such a decision has not been made. Administrative Case Litigation Act, Article 3, para. 6. A mandamus action is admitted only when serious damage is likely to be caused if the specific administrative decision is not made and there are no other appropriate means to avoid such damage. *Ibid*., Article 37-2, para. 1.
"Action for an injunctive order": An action seeking an order to prevent an administrative agency from making a specific administrative decision when it is about to make a decision that it should not make. Administrative Case Litigation Act, Article 3, para. 7. An action for an injunctive order is admitted only when serious damage is likely to be caused if the specific administrative decision is made. *Ibid*., Article 37-4, para. 1.
"Provisional order of mandamus": An action seeking an order to require an administrative agency to make a specific administrative decision on a provisional basis, when a mandamus action is filed. An action for provisional order of mandamus is admitted only when there is an urgent necessity in order to avoid damage that cannot be compensated, which would be caused due to the specific administrative decision not being made, and the action on the merits seems well-grounded. *Ibid*., Article 37-5, para. 1.
"Provisional injunctive order": An action seeking an order to prevent an administrative agency from making a specific administrative decision on a provisional basis when an action for an injunctive order is filed. An action for provisional injunctive order is admitted only when there is an urgent necessity in order to avoid any damage that cannot be compensated, which would be caused due to the specific administrative decision being made, and the action on the merits seems well-grounded. *Ibid*., Article 37-5, para. 2.
40. *Ibid*., Article 9, para. 1.

into account the purposes and objectives of each law as well as the content and nature of the interest in question.[41]

With regard to the standing to sue concerning the construction licensing of nuclear reactors, the Supreme Court decision concerning the Fast Breeder Reactor (FBR) Monju stated:

> In light of such matters as the reason why [Article 24, para. 1,] item (iii) (limited to the part concerning technical capability) and item (iv) [of the Regulation Act] have been established, and the nature of the damage that is taken into consideration under these items, it is appropriate to construe that these items are intended to protect not only the safety of the lives and health of the public and their interest in the environment as a general public interest, but also intended to protect the safety of the lives and health, etc. of the scope of residents who are living near the reactor facilities and are likely to suffer more direct and serious damage resulting from a possible disaster that could be caused by such an accident, etc., as an individual interest of each of these residents.
>
> The issue as to whether or not the area where these residents are living is an area where the residents are likely to suffer more direct and serious damage in the event of such a disaster that could be caused by a reactor accident, etc. as mentioned above should be determined rationally in light of socially accepted ideas, while taking into consideration specific conditions regarding the reactors concerned (e.g. the type, structure and scale) and focusing on the distance between the area where those residents are living and the location of the reactors.[42]

The standing to sue is thus judged mainly based on the distance between the plaintiffs' domiciles and the location of the nuclear reactor in question. The 1992 Monju FBR Supreme Court decision found standing to sue for the residents living within a distance of 58 km from the nuclear reactor.

On the other hand, standing to sue is established only for "a person who has legal interest", and, therefore, legal interests that do not belong to any specific person (e.g. protection of the environment) are not taken into account. For example, an environmental group does not have standing only for the purpose of protection of the environment. Nevertheless, the court tends to judge individual standing more flexibly than before, particularly after the 2004 amendments to the Administrative Case Litigation Act. In practice, some residents living close to a nuclear reactor file actions as plaintiffs[43] and various other people and groups provide them with support. As a result, a wide range of people and groups are often involved in an action. In addition, 1992 Monju FBR Supreme Court decision established the clear rule on standing to sue for the cases where the construction licensing of a nuclear reactor is disputed. Although the standing to sue can still be disputed, in recent

41. *Ibid.*, Article 9, para. 2.
42. Supreme Court decision of 22 September 1992, *Minsyu*, No. 46, Vol. 6, p. 571 (1992 Monju FBR Supreme Court decision). A provisional translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=1406 (accessed 4 May 2018). In this case, the Supreme Court handed down two decisions separately. This decision only dealt with the standing to sue, and the merit of this case was judged separately in 2005. The second decision will be cited in Section IV.
43. Considering the density of population in the area surrounding nuclear reactors, a large number of people may have standing. For example, according to the documents posted on the Japan Cabinet Office website, 210 000 people and 180 000 people live within a 30 km radius of Sendai NPP and Takahama NPP, respectively. "Support for regional disaster prevention plan and evacuation plan formulation", www8.cao.go.jp/genshiryoku_bousai/keikaku/keikaku.html (in Japanese) (accessed 4 May 2018).

times, it does not constitute a major issue that determines the conclusion of a decision concerning construction licensing of a nuclear reactor.

2. Civil cases

i) Injunction based on "personal rights"

Plaintiffs may sue an operator to shut down its nuclear reactor according to the Code of Civil Procedure by claiming that the operation of a nuclear reactor infringes on plaintiffs' "personal rights". Injunctions based on "personal rights" were first admitted by the court in cases concerning publications violating privacy and then came to be used in the environmental field. Injunction based on "personal rights" is not clearly provided for in positive law but has been developed through court decisions and academics. For example, a high court decision concerning an injunction on the noise levels of an airport explained the idea of personal rights as follows:

> There is no doubt that lives and health and freedom of intellectual activity are fundamental for human beings and shall be the supreme consideration in legislation. All the people shall live in peace, liberty and dignity as human beings and such lives shall be absolutely respected. These thoughts are the basis of Article 13 of the Constitution[44] and also supported by Article 25 of the Constitution[45] in other ways. These interests concerning lives, health or psychological safety and privacy constitute the basis of human beings. These collective interests can be called "personal rights". No one may infringe on these personal rights without reason, and one shall have the right to defend his/her personal rights from infringement. Accordingly, one can claim a cessation of the actions that may cause physical damage (such as diseases) as well as serious mental anguish or privacy concerns. Even when damage has not yet actually arisen, one may claim prevention of potential harmful actions if there is actual risk of damage. The rights to suspend and prevent nuisance based on personal rights can be the basis of injunction under the civil procedure.[46]

"Personal rights" are thus understood as individuals' rights concerning physical and psychological safety. It is, therefore, distinguished from public interest (e.g. protection of the environment) and is only admitted for individuals (i.e. organisations and groups do not have personal rights).

ii) Procedure

An action for an injunction based on "personal rights" is subject to the jurisdiction of the court in the location of the defendant's principal office or business office,[47] as well as in the place where the tort took place (in this case, the location of plaintiffs' domiciles).[48] District courts exist in every prefecture, and they have jurisdiction in the prefecture where they are located. Therefore, it is possible that more than one court could have jurisdiction over cases involving the same NPP.

44. Japanese Constitution, Article 13: All of the people shall be respected as individuals. Their right to life, liberty, and the pursuit of happiness shall, to the extent that it does not interfere with the public welfare, be the supreme consideration in legislation and in other governmental affairs.
45. *Ibid.*, Article 25, para. 1: All people shall have the right to maintain the minimum standards of wholesome and cultured living.
46. Osaka High Court decision of 27 November 1975, *Hanreijihou*, No. 797, p. 36. *Hanreijihou* is a law report published by a private company.
47. Code of Civil Procedure, *supra* note 28, Article 4, paras. 1 and 4.
48. *Ibid.*, Article 5.

In civil cases, plaintiffs sue an operator to shut down its nuclear reactor and the licensing decision is not directly attacked. Accordingly, civil cases have no relationship with the administrative appeal procedure and plaintiffs may file an action with the court without going through the administrative appeal procedure. In addition, there is no time limit to file an action following the licensing decision for the nuclear reactor in question. Plaintiffs may bring an action at any time as long as the nuclear reactor is in operation.

Since court procedures usually take time and rights may be damaged by the passage of time, the Civil Provisional Remedies Act[49] provides provisional remedies to protect the rights of the parties.[50] The court may issue an order to take certain actions or to prohibit parties from taking certain actions, or issue any other order as necessary.[51] A provisional order may be issued when there is a likelihood that it will be impossible or extremely difficult for the plaintiff to exercise its rights due to any changes to the existing state of the matter.[52]

The proceedings concerning provisional remedy are simplified compared to the proceedings concerning the merits of civil cases. The plaintiff is only required to provide *prima facie* evidence on: i) existence of its rights and ii) necessity of preserving those rights through a provisional remedy.[53] With regard to the necessity of provisional remedy, for example, a lower court decision concerning the restarting of a nuclear reactor stated:

> The operator is not likely to immediately restart nuclear reactor operations, at least not before the NRA issues a permit for basic design change. Therefore necessity of provisional remedy is not recognised unless the plaintiffs provide *prima facie* evidence on the specific circumstances where the nuclear reactor must be immediately shut down to avoid significant damage or imminent danger.[54]

An objection to an order for a provisional remedy may be filed with the court that issued the order,[55] and an appeal concerning the judgment on the objection may be filed with the higher court.[56] However, the filing of an objection or appeal on its own does not suspend the execution of the order for a provisional remedy. Once a lower court has issued an order for a provisional injunction on a nuclear reactor, which is one type of provisional remedy, it must be temporarily shut down unless the provisional order is revoked through an objection or appeal. This was the case with Kansai Electric Power Company's Takahama NPP following the provisional injunctive order by Fukui District Court, as explained in Section V.[57]

iii) Standing to sue

Plaintiffs may establish their standing to sue in civil cases when they have legal interests to be protected by a decision in their favour. In practice, this judgment overlaps with the decision on whether the operation of a nuclear reactor infringes on plaintiffs' personal rights. Accordingly, whether a plaintiff has standing to sue is not a major issue that determines the outcome of cases where an injunction against

49. Civil Provisional Remedies Act, Act No. 91 of 1989.
50. Provisional remedies are widely used, as explained in Section V.
51. Civil Provisional Remedies Act, *supra* note 49, Article 24.
52. *Ibid*., Article 23, para. 1.
53. *Ibid*., Article 13.
54. Fukui District Court decision of 24 December 2015, *Hanreijihou*, No. 2290, p. 73. This decision revoked its earlier provisional injunctive order regarding the Ohi NPP.
55. Civil Provisional Remedies Act, *supra* note 49, Article 26.
56. *Ibid*., Article 41, para. 1.
57. However, the provisional injunctive order was revoked in the objection to the Fukui District Court. Fukui District Court decision of 24 December 2015, *Hanreijihou*, No. 2290, p. 29.

the operation of a nuclear reactor is sought. However, as personal rights are only admitted for individuals, organisations and groups do not have standing to sue in actions for injunction based on personal rights.

Class actions do not exist in Japanese law except in a specific field, and this does not apply to nuclear energy.[58] Although tens or sometimes hundreds of plaintiffs are involved in an action where an injunction against the operation of a nuclear reactor is disputed, this is not through a class action procedure but rather because each plaintiff claims protection of their own personal rights.

3. Summary

The following table summarises the procedures for administrative and civil cases, which are meant to ensure citizen access to the courts.

	Administrative case	Civil case
Claim	(1) revocation or (2) declaration of nullity of licensing decision	injunction against operation of nuclear reactors
Plaintiff	only individuals; no organisations or groups	only individuals; no organisations or groups
Standing to sue	A person must have a legal interest in the matter. The main consideration in determining the legal interest is the distance of the person's domicile from the nuclear reactor in question.	A person must have legal interest to be protected. In practice, this judgment overlaps with the judgment on the infringement of a plaintiff's personal rights.
Defendant	Japanese Government	Nuclear operator
Jurisdiction of the district court	(1) location of the administrative agency; or (2) location of the high court that has jurisdiction over the plaintiff's domicile	(1) location of the defendant's principal office or business office; or (2) location of the plaintiff's domicile
Time limit	Revocation: must be filed within (1) six months of the day on which the person who seeks revocation became aware of the fact that the administrative decision was made; or (2) one year of the date of the administrative decision Declaration of nullity: No time limit	No time limit
Administrative appeal procedure before filing an action to the court	Optional	Not applicable

As mentioned, only individuals have standing to sue in both administrative and civil cases, since actions for injunction based on personal rights as well as actions for revocation or declaration of nullity of administrative decision are based on an individual's legal interests. But, in practice, courts tend to interpret standing more flexibly than before and various groups often provide support to the residents living close to a nuclear reactor. As a result, a wide range of people and groups are involved in actions concerning nuclear reactors.

In both civil and administrative cases, the residents living in the prefecture where an NPP is located as well as in the neighbouring prefectures may bring actions in the district courts. This means that multiple actions can be filed in different prefectures concerning one nuclear reactor (though each individual plaintiff has to choose a single court when bringing an action). Thus, actions on one nuclear reactor can be filed multiple times by different plaintiffs without any time limit (except actions for revocation of administrative decision).

58. Act on Special Measures Concerning Civil Court Proceedings for the Collective Redress for Property Damage Incurred by Consumers, Act No. 96 of 2013.

IV. Standards of judicial review for administrative cases

This section summarises the leading cases where the Supreme Court established its standards of judicial review for administrative cases.

As a general rule, administrative agencies have discretionary power in their decision-making, but the court may revoke an administrative decision when it involves illegality. According to the Supreme Court:

> Instances where the decision becomes unlawful are limited to cases where the decision was made in excess of the discretionary power granted by law or where there was an abuse of discretion. Only in such cases may the court annul the decision. […]
>
> However, since the reason, purpose, and scope of discretion granted by law to an administrative agency differ, and circumstances in which the decision is found unlawful for excess or abuse of discretion vary, each kind of decision has to be examined individually.[59]

This is the general principle in actions for revocation and declaration of nullity of administrative decisions. Then, how does the court, which only has expertise in law, judge illegality in the licensing decisions for nuclear reactors, a subject that requires scientific and technological expertise? The Ikata Supreme Court decision established the standards of judicial review for administrative cases on this issue.

1. The Ikata Supreme Court decision

The decision first described the features of the regulatory authority's safety review as follows:

> The examination on the safety of reactor facilities including the technical capabilities as mentioned above is to study, from a multifaceted and comprehensive perspective, matters such as the engineering safety of the reactor facilities themselves, the radiation effect on the workers, neighboring residents and surrounding environment when the reactors are in normal operation, and the effect on the neighboring areas in the event of an accident, in connection with natural conditions of the planned site of reactors (e.g. the land features, nature of the soil, and weather), social conditions (e.g. population distribution), and the abovementioned technological capabilities of the person who is to install reactors. This examination also covers matters concerning future forecasts. Thus, it is obvious that said examination requires comprehensive assessment based on the latest scientific, expert technical knowledge of a considerably high level not only in the field of nuclear engineering but also across a wide range of fields. Article 24, paragraph (2) of the Regulation Act provides that in granting permission for the installation of reactors, the Prime Minister must hear in advance the opinion of the Atomic Energy Commission with respect to the application of the criteria provided in paragraph (1), item (iii) of said Article (limited to the part concerning technical capabilities) and in item (iv) of said paragraph, and respect such opinion.[60] It is appropriate to construe that the purpose of this provision is to, in consideration of such characteristics of the

59. Supreme Court decision of 4 October 1978, *Minsyu*, Vol. 32, No. 7, p. 1223. A provisional translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=56 (accessed 4 May 2018).
60. These provisions were in existence at the time of the licensing decision. Now these articles correspond to the ones cited in Section II, sub-section 2. In addition, the Prime Minister (as head of the Science and Technology Agency) and the Atomic Energy Commission were responsible for the safety regulation at that time.

> examination on the safety of reactor facilities as explained above, leave the issue of conformity to the criteria provided in these items to the reasonable assessment to be made by the Prime Minister while respecting the opinion based on scientific, expert technical knowledge of the Atomic Energy Commission, which consists of persons with knowledge and experience in the relevant specialized fields.[61]

A Supreme Court Counsellor explained this point as follows:

> Machines and equipment developed by utilising advanced scientific and technological knowledge can never be absolutely safe, but always have some risk of accidents. However, when such risks are recognised as socially acceptable or almost controllable by humans, we deem such machines and equipment safe and utilise them by comparing their risk level and benefits. It can be said that this idea of relative safety has been generally accepted. […]
>
> Although people have a different understanding of safety levels, the responsible authority for licensing of nuclear reactors determines the safety level as licensing standards; i.e., it determines the requirements for licensing and reviews conformity to such requirements. Such decision and review must be based on the latest scientific knowledge and take into consideration the risk levels that are deemed acceptable in our society.[62]

A licensing decision of a nuclear reactor requires the latest scientific and technological expertise of which the court has only limited knowledge. It also requires a kind of political choice concerning the socially acceptable risk level of nuclear technology. Considering these features, the Regulation Act lets the regulatory authority, which is the administrative agency with the scientific and technological expertise, determine the regulatory standards and review conformity to the standards.

Following these considerations, the Ikata Supreme Court decision stated that the court shall review the regulatory authority's licensing decision using the following standards.

i) Rationality of regulatory standards and review process

The Ikata Supreme Court decision stated:

> Taking these points into consideration, when the court examines and makes a determination on a dispute in an action filed to seek revocation of an administrative disposition to grant permission for the installation of reactors, in which the point in dispute is appropriateness of the defendant administrative agency's assessment on the safety of the reactor facilities, the court should focus on whether or not there are unreasonable aspects in the assessment that the defendant administrative agency has made on the basis of the expert technical investigation, deliberation and assessment by the Atomic Energy Commission or the Reactor Safety Examination Committee. If, in light of the current science and technology standards, it is found that there are unreasonable aspects in the specific examination criteria employed in that investigation and deliberation, or there are errors or omissions that cannot be overlooked in the investigation, deliberation or assessment process through which the Atomic Energy Commission or the Reactor Safety Examination Committee assessed the relevant reactor facilities to be in

61. Ikata Supreme Court decision, *supra* note 25.
62. Toshifumi Takahashi (1992), "Commentary", *Commentaries of the Supreme Court Decisions (civil cases)*, 1992 edition, *Housoukai*, p. 418. Counsellors of the Supreme Court publish commentaries on major Supreme Court decisions. Although these commentaries do not have any official status, they are useful for understanding Supreme Court decisions.

> conformity to said specific examination criteria, and the defendant administrative agency is deemed to have relied on these factors when making its assessment, the defendant administrative agency's assessment should be held to include unreasonable aspects, and therefore the administrative disposition to grant permission for the installation of reactors that has been issued based on that assessment should be considered to be illegal.[63]

In reaching its determination, the court focused on whether the regulatory standards used in the decision were rational or not, as well as whether the regulatory authority's decision-making process involved any significant error or fault. Thus, rather than reviewing the conformity of the administrative decision to the regulatory standards from the regulatory authority's viewpoint and possibly overriding the administrative decision, the Supreme Court reviewed the administrative decision with some deference.

The next sub-section will explain this approach in greater detail.

ii) The latest scientific knowledge

The Ikata Supreme Court decision stated that the regulatory standards and decision-making process must be reviewed based on the "latest scientific knowledge". The aforementioned Supreme Court Counsellor explained this point as follows:

> Even if the safety measures included in the basic design were considered sufficient based on the scientific knowledge of that time, the authority's licensing decision regarding the safety of the nuclear reactor shall be considered illegal and be revoked if the latest and widely accepted scientific knowledge at the time of the proceedings of the action for revocation of the licensing decision has revealed that the safety measures are insufficient and the nuclear reactor involves significant risk of severe accident once it is constructed and operated as specified in the basic design.[64]

iii) Scope of judicial review

The Ikata Supreme Court decision stated:

> … it is appropriate to construe that the safety examination to be conducted in the stage of granting permission for the installation of reactors does not cover all the matters concerning the safety of the reactor facilities, but only covers matters concerning the safety of their basic design.[65]

Accordingly, the judicial review on the licensing decision for construction of a nuclear reactor may only deal with the basic design and cannot address issues concerning detailed design and construction methods, operations, etc. Those issues should be disputed in separate actions challenging the specific administrative decisions.

In addition, the second Monju FBR Supreme Court decision stated:

> … it should be construed that the competent minister is also authorized to make a reasonable judgment, while giving due consideration to opinions of the Nuclear Safety Commission, regarding what matters fall under the scope of matters concerning the basic design of the nuclear plant which should be subjected to safety examination at the stage of granting permission for the

63. Ikata Supreme Court decision, *supra* note 25.
64. Takahashi (1992), "Commentary", *supra* note 62, pp. 423-424.
65. Ikata Supreme Court decision, *supra* note 25.

establishment of the nuclear reactor, in the course of making a judgment on the compliance with the standards.[66]

Thus, the regulatory authority has a kind of discretionary power to determine the scope of the "basic design" of a nuclear reactor in the safety review for the construction licensing.

iv) Burden of proof

In principle, the plaintiffs shall bear the burden of proof to show that an administrative decision involves an abuse or excess of discretionary power in actions for revocation and declaration of nullity of administrative decisions.[67] While the Ikata Supreme Court decision applied this principle, it required the defendant administrative agency to first offer sufficient evidence and documents and provide an explanation showing that there are no unreasonable aspects in the specific regulatory standards employed in the investigation and deliberation by the Atomic Energy Commission or the Reactor Safety Examination Committee or the investigation, deliberation and assessment process, etc. which the defendant administrative agency relied on. If the defendant administrative agency fails to offer sufficient evidence and explanation on this issue, it is practically presumed that the defendant administrative agency's assessment includes unreasonable aspects.

v) Summary

The framework just described was confirmed by a subsequent Supreme Court decision, handed down on the same day as the Ikata Supreme Court decision, on the construction licensing of the TEPCO Fukushima Daini NPP.[68] In addition, lower courts have applied the same standards in cases related to nuclear fuel manufacturing facilities,[69] radioactive waste management facilities,[70] etc., which means the judicial review standards of the Ikata Supreme Court decision are well established in administrative cases.

However, the Ikata Supreme Court decision only briefly explained why the regulatory standards and decision-making process in question were rational and did not clearly indicate the factors to be focused on when analysing those issues. The High Court and the Supreme Court decisions concerning the construction licensing for the Monju FBR more closely reviewed the rationality of the regulatory standards and the regulatory authority's decision-making process, which are addressed next.

2. *The Nagoya High Court and the Supreme Court decisions concerning the construction licensing for the Monju FBR*

In this case, the Nagoya High Court and the Supreme Court both cited the Ikata Supreme Court decision, but reached different conclusions: the High Court determined the licensing decision to be illegal,[71] while the Supreme Court found it to

66. Supreme Court decision of 30 May 2005, *Minsyu*, Vol. 59, No. 4, p. 671 (2005 Monju FBR Supreme Court decision). A provision translation of this decision is available on the Supreme Court website at: www.courts.go.jp/app/hanrei_en/detail?id=749 (accessed 4 May 2018). This is the second decision concerning the construction licensing of the Monju FBR, and this decision addressed the merits of this case. The next sub-section will explain this decision in greater detail.
67. Supreme Court decision of 7 April 1967, *Minsyu*, Vol. 21, No. 3, p. 572.
68. Supreme Court decision of 29 October 1992, *Hanreijihou*, No. 1441, p. 50.
69. Aomori District Court decision of 15 March 2002 and Sendai High Court decision of 9 May 2006.
70. Aomori District Court decision of 16 June 2006 and Sendai High Court decision of 22 January 2008.
71. Kanazawa branch, Nagoya High Court, decision of 27 January 2003, *Hanreijihou*, No. 1818, p. 3.

be legal.[72] This case is considered somewhat special since the reactor in question was an FBR (not a typical power reactor) and the plaintiffs claimed declaration of nullity, which must involve more serious illegality than revocation. However, it is the only case where the conclusions of the High Court and Supreme Court were split, and it has enhanced the understanding of the judicial review standards established by the Ikata Supreme Court decision.

Three major technical issues were at the centre of the two decisions. The Nagoya High Court concluded that the regulatory standards and decision-making process held significant error or fault. In analysing the three issues, the Nagoya High Court found that: the safety review for the construction licensing of the Monju FBR did not take into account what it considered to be necessary technical specifications for the steel liner; the accident analysis did not include a necessary scenario; and an accident scenario analysis required a more conservative approach. The Supreme Court, on the other hand, found no error or fault concerning the above-mentioned three issues and reversed the Nagoya High Court decision.

Under the judicial review standards of the Ikata Supreme Court decision, the judges should investigate each stage of the decision-making process and review the rationality of the process, i.e. whether the regulatory authority took into account all facts (e.g. necessary technical specifications or scenarios) that should have been considered and whether the analysis of each factor was reasonably conducted. The judges should not put themselves in the regulatory authority's position to determine conformity to the regulatory standards as such a determination requires extensive scientific and technological expertise. Rather, the judges should indirectly review the rationality of the regulatory authority's decision by focusing on its process. This type of judicial review is generally understood by academics as "judicial control over the decision-making process of the administrative agency". In this way, the standards set out in the Ikata Supreme Court decision avoid conflict with the scientific and technological decisions of the regulatory authority while exercising some legal control over administrative decisions.

3. Summary

The Ikata Supreme Court decision established the judicial review standards for administrative cases where the licensing decision for construction of nuclear installations is disputed:

1. the court reviews whether the standards set by the regulatory authority are rational or not, and whether the review and decision-making process of regulatory authority has any significant error or fault, i.e. whether the regulatory authority took into account all facts that should have been considered and whether the analysis of each factor was reasonably conducted;
2. the court reviews the licensing decision based on the latest scientific knowledge; and
3. the review of the licensing decision only deals with the basic design of a nuclear installation.[73]

The court does not conduct the same review of conformity to the regulatory standards as the regulatory authority does, but indirectly reviews the rationality of the regulatory authority's decision by focusing on its decision-making process. In this regard, the framework established by the Ikata Supreme Court decision is somewhat deferential to the scientific and technological decisions of the regulatory

72. 2005 Monju FBR Supreme Court decision, *supra* note 66.
73. Ikata Supreme Court decision, *supra* note 25.

authority,[74] but still tries to exercise some legal control over the administrative decisions.

In addition, the Ikata Supreme Court decision balances the equities between both parties by requiring that while the plaintiffs bear the burden of proof on excess or abuse of discretionary power of the regulatory authority, the defendant must first offer sufficient evidence and documents and provide an explanation of the rationality of the regulatory standards and decision-making process.

Since there has not been any major court decision in administrative cases following the Fukushima Daiichi NPP accident, it is not yet clear whether there will be any changes in the standards of judicial review following a severe accident. In civil cases, however, there have been important court decisions since the Fukushima Daiichi NPP accident. The next section will examine the standards of judicial review for civil cases by comparing them with the Ikata Supreme Court decision.

V. Standards of judicial review for civil cases

While the illegality of licensing decisions is the issue in administrative cases, the existence of an actual risk to personal rights is the issue in civil cases. Therefore, the standards of judicial review established in the Ikata Supreme Court decision cannot be directly applied to civil cases. No Supreme Court decision has yet established the standard to determine when a nuclear reactor presents an actual risk to personal rights and whether an injunction to cease its operation can be issued. Different approaches to this issue exist in lower court decisions, and the conclusions also differ.

The following sub-sections illustrate the differences between the lower court decisions that dismissed claims for injunction and those decisions that granted them.

1. Lower court decisions that dismissed claims for injunction

The leading case is the Sendai District Court decision concerning Tohoku Electric Power Company's Onagawa NPP,[75] which mostly applied the Ikata Supreme Court decision's approach to a civil case. Both before and after the Fukushima Daiichi NPP accident, most lower court decisions basically followed the framework of the Onagawa NPP decision when dismissing claims for an injunction against the operation of a nuclear reactor. The Fukuoka High Court decision concerning Kyusyu Electric Power Company's Sendai NPP[76] is one such example that explained the legal framework in more detail as well as why the High Court applied the judicial review standards of an administrative case framework to a civil case. The following paragraphs summarise the High Court decision.

i) Standards of judicial review

The Fukuoka High Court said:

74. While the Ikata Supreme Court decision mentioned the scientific and technological expertise of the regulatory authority, it did not say anything about the independence of the regulatory authority. This is, supposedly, because the regulatory authority was placed under the Science and Technology Agency and the AEC, which were responsible for promotion of nuclear energy, and independence of the regulatory authority did not constitute a major issue at that time. However, recent lower court decisions in civil cases after the establishment of the NRA emphasise independence of the regulatory authority as well as its scientific and technological expertise.
75. Sendai District Court decision of 31 January 1994, *Hanreijihou*, No. 1482, p. 3 (Onagawa NPP decision).
76. Miyazaki branch, Fukuoka High Court, decision of 6 April 2016, *Hanreijihou*, No. 2290, p. 90 (Fukuoka High Court decision).

> … in an action for injunction against the operation of a nuclear reactor to prevent infringement of personal rights, the safety level to be ensured in a nuclear reactor shall be judged according to the level of safety that is acceptable for our society: in other words, it shall be judged considering the risk level that is acceptable for our society, i.e., according to social convention.[77]

Then the question to be answered is: what is the socially acceptable level of risk, i.e. what is the social convention? The court looked to the amended Regulation Act for the answer:

> … the amended Regulation Act is based on lessons learnt from the Fukushima Daiichi NPP accident and requires that the safety regulation of a nuclear reactor shall reflect the latest expertise and the nuclear reactor shall conform to the regulatory standards, which are based on the latest scientific and technical expertise. In addition, having regard to the limit of scientific and technological expertise, the amended Regulation Act has also strengthened severe accident management measures to prevent any severe accident causing dispersion of radioactive substances to the area even in an unexpected event where the safety functions of a nuclear reactor are damaged. Considering these purposes and objectives of the amended Regulation Act, it is recognised that the Act requires achieving safety of a nuclear reactor so that it is well prepared for natural disasters that are reasonably predicted by the latest scientific and technological expertise. The term "large scale natural disasters" provided in Article 1 of the said Act[78] shall be understood as meaning the above-mentioned natural disaster. There are no grounds showing that the Act requires ensuring the safety level argued by the plaintiffs.[79] This regulatory framework provided by the amended Regulation Act is considered to reflect the understanding of the social convention in our country concerning the safety level of nuclear reactors to be prepared for natural disasters.[80]

Thus, according to the High Court, social convention does not call for zero risk; instead, the risk of a nuclear reactor is socially acceptable if it is well prepared for reasonably predicted natural disasters.[81]

However, the Regulation Act itself does not specify what a reasonably predicted natural disaster is. The High Court considered that according to the amended Regulation Act, it should be specified through the regulatory standards and the regulatory authority's safety review. The High Court said:

> The latest scientific and technological expertise is needed in order to identify potential natural events. Under the amended Regulation Act, these potential natural events are one of the elements concerning the safety of the basic design and are taken into account in the regulatory standards on location,

77. *Ibid.*
78. Article 1 of the Regulation Act provides the objectives of the Act: "This Act is enacted for the purposes of providing necessary regulations … on the installation, operation, etc. of reactors, while taking into consideration the possibility of large scale natural disasters …". Regulation Act, *supra* note 3.
79. According to the court decision, the plaintiffs claimed, "nuclear power reactors must achieve the safety level, equal to absolute safety where they can prevent any disasters that the latest scientific and technological expertise cannot reasonably predict" or "the safety measure must take into account every natural disaster unless the possibility of occurrence is nil or just about nil".
80. Fukuoka High Court decision, *supra* note 76.
81. The court specifically mentioned natural disasters since the major issues in this case were safety measures for natural disasters.

> structure and equipment of nuclear reactors provided by the Ordinances of the NRA and other detailed regulatory standards used in the NRA's safety review for construction licensing of a nuclear reactor. As mentioned above, the latest and advanced scientific and technological expertise in various fields is needed in order to set the regulatory standards and to review conformity to the standards, which include identification of potential natural events that may damage the safety function of a nuclear reactor. In addition, the NRA's executives are composed of a Chairman and Commissioners who are highly experienced or have academic standing on the safety of nuclear energy use. The Chairman and Commissioners perform their duties independently and neutrally, based on their expertise.[82]

Taking these circumstances into account, the court stated that where the NRA has issued a permit or approval for construction, basic design change, construction methods, etc., of the defendant's nuclear reactor according to the Regulation Act, and the NRA has decided that the nuclear reactor conforms to the NRA's detailed regulatory standards, the defendant is only required to offer sufficient evidence and documents and provide an explanation that the NRA's detailed regulatory standards and its decision on conformity to the detailed regulatory standards do not involve any irrational points and the decision-making process does not involve any significant error or faults. As a result, according to social convention, the operation of a nuclear reactor does not involve actual risk if it conforms to the regulatory standards under the Regulation Act and if the standards, as well as the regulatory authority's decision-making process, are deemed rational.

In this way, the High Court judges the actual risk of a nuclear reactor through the rationality of the NRA's regulatory standards and decision-making process. Although this framework limits the scope of judicial review to these points, the High Court explained that it is an "intrinsic constraint of the judicial system":

> The latest and advanced scientific and technological expertise in various fields are needed in order to set the detailed regulatory standards and to review conformity to the standards. The current judicial system including the civil procedure has some arrangements to complement expertise, such as expert testimony and participation of technical advisors. However, it does not mean that the court judges the rationality of scientific and technical decisions from the same viewpoint as the regulatory authority … In addition, having regard to the aforementioned nature of the NRA as a regulatory authority, … the court has no choice but to review whether any irrational points exist in the detailed regulatory standards set and used by the NRA, whether any irrational points exist in the NRA's decision on conformity to the detailed regulatory standards and whether the NRA's review and decision-making process involves any error or faults.[83]

Thus, the Fukuoka High Court adopted almost the same judicial review standards as the Ikata Supreme Court decision.

Although this decision does not clearly mention "the latest scientific knowledge", it is generally understood that in civil cases the court judges the safety of a nuclear reactor based on the latest scientific knowledge at the time of the proceedings. However, in civil cases, the court does evaluate the risk of a nuclear reactor, and accordingly, in civil cases, the scope of judicial review is not limited to the basic design. Instead, the court may find the existence of risk if there is any irrationality in the detailed design, construction methods or operation etc.

82. Fukuoka High Court decision, *supra* note 76.
83. *Ibid*.

ii) Burden of proof

In addressing the burden of proof in a civil case, the Fukuoka High Court said:

> … the burden of proof on their rights to be protected or the existence of aforementioned actual risk shall be borne, in principle, by the plaintiffs. Nevertheless, … the operator of the nuclear installation in question apparently has knowledge and documents on whether the contents of the new regulatory standards set by the NRA are rational or not, and whether the NRA's decision that the nuclear installation in question conformed to the regulatory standards is rational. On the other hand, if a nuclear power reactor is objectively recognised as not ensuring safety, residents living in the area closest to the nuclear reactor are more likely to be damaged by radiation exposure in an accident causing dispersion of radioactive substances to the area, and their health and lives would be directly and seriously damaged … [84]

Taking these circumstances into account, the court stated that even in an action for injunction on operation of a nuclear reactor to prevent infringement of personal rights, when the plaintiffs live in areas where their health and lives would be directly and seriously damaged by an accident causing dispersion of radioactive substances to the area due to a lack of safety of the nuclear reactor, the operator who is responsible for construction and operation of the reactor shall offer sufficient evidence and documents and provide an explanation showing that there is no actual risk of events where radioactive substances would be dispersed to the area due to operation of the reactor and the health and lives of the residents living in the vicinity of the reactor are likely to be directly and seriously damaged. If the defendant does not sufficiently provide explanation and evidence, the existence of actual risk is practically presumed.

Thus, while the plaintiffs bear the burden of proof, in principle, the defendant must first offer evidence and documents and provide a sufficient explanation showing that there is no actual risk of the reactor. In this way, the Fukuoka High Court balances the equities between the parties just as the Ikata Supreme Court decision did.

Although the lower court decisions that dismissed claims differ in the details, they broadly used the above-mentioned framework. On the other hand, the lower court decisions that granted injunctions used different approaches.

2. Lower court decisions that granted injunctions

Four decisions granted injunctions following the Fukushima Daiichi NPP accident as of April 2018.[85] The Otsu District Court decision concerning Kansai Electric Power Company's Takahama NPP is one such example. In this case, the residents living within 70 km of the Takahama NPP filed a claim for an injunction. The Otsu District Court granted the injunction by pointing out the lack of a convincing explanation regarding how safety measures were strengthened after the Fukushima Daiichi NPP accident:

> … since now we have actually experienced the risk of nuclear reactors in the Fukushima Daiichi NPP accident following the earthquake off the Pacific coast of Tohoku, the risk of the nuclear reactor operation to infringe on plaintiffs' personal rights is practically presumed unless the defendant provides sufficient explanation and *prima facie* evidence showing how the

84. *Ibid.*

85. Although there is one district court decision that granted an injunction before the Fukushima Daiichi NPP accident (Kanazawa District Court decision of 24 March 2006, *Hanreijihou*, No. 1930, p. 25), this sub-section focuses on the decisions after the accident to specifically address the post-accident circumstances.

> regulations on design and operation of the nuclear reactor have been strengthened and how the defendant has responded to the new regulations. We have learned lessons from the Fukushima Daiichi NPP accident, but nevertheless the nuclear reactor in this case is considered as having problems in the design concept for severe accident management based on the experience of the Fukushima Daiichi NPP accident, the emergency response measures which largely rely on external power sources and the design basis earthquake ground motion to specify seismic performance. The appropriateness of countermeasures for tsunami and evacuation plans still remains in question. Thus, the nuclear reactor is considered as having significant risk to plaintiffs' personal rights, but the defendant did not sufficiently provide explanation and *prima facie* evidence showing that safety of the nuclear reactor is ensured …[86]

Thus, the court considered that the experience of the Fukushima Daiichi NPP accident clearly showed the risk of the nuclear reactor operation to personal rights; therefore, such risk is practically presumed unless the defendant sufficiently provides explanation and evidence showing how the operator and the regulatory authority has strengthened the safety of the nuclear reactor.

The Fukui District Court decision that granted an injunction against the Kansai Electric Power Company's Ohi NPP directly evaluated whether the nuclear reactor presented an actual risk without looking at the rationality of the NRA's safety review. The court stated:

> Our society will not progress unless we accept the potential risk of new technology. If the nature and extent of risks associated with a new technology is not evident, it is extremely difficult for the court to decide whether an injunction to ban such technology should be granted or not. However, when the nature of risks and the extent of damage arising from a technology are evident, those who introduce such technology are required to ensure a safety level responding to the nature of the risk and the extent of damage. Accordingly, the court should just review whether the safety level is ensured or not, without worrying about conflicts between the development of our society and potential risk of the technology. The Fukushima Daiichi NPP accident clearly showed the nature of the risk associated with nuclear technology for power generation and the extent of damage arising from the risk. In this case, the court should review whether the nuclear reactor in question involves any actual risk of such accident …[87]

According to the Fukui District Court, as the risk of nuclear reactors is now evident because of the Fukushima Daiichi NPP accident, the court is able to directly judge the existence of the actual risk of a nuclear reactor without looking at the regulatory standards or the regulatory authority's safety review.

The Fukui District Court decision that granted an injunction against the Takahama NPP also directly evaluated whether the nuclear reactor presented an actual risk without looking at the rationality of the NRA's safety review. It also denied the rationality of the regulatory standards, by saying:

> …the new regulatory standards are recognised as rational when they are strict enough to prevent any risk of severe accident of the nuclear reactor as long as it conforms to them. However, the new regulatory standards are too lax and the safety cannot be ensured even if the nuclear reactor meets them.

86. Otsu District Court decision of 9 March 2016, *Hanreijihou*, No. 2290, p. 75. This decision was revoked by the Osaka High Court decision of 28 March 2017.
87. Fukui District Court decision of 21 May 2014, *Hanreijihou*, No. 2228, p. 72 (Fukui District Court Ohi decision). This decision was revoked by the Fukui District Court, *supra* note 54.

> […] The regulatory standards are not rational, and, therefore, actual risks to plaintiffs' personal rights can be admitted without reviewing whether the nuclear reactor conforms to the regulatory standards or not.[88]

There is no consistent judicial standard of review in these cases, but based on the experience of the Fukushima Daiichi NPP accident, the courts either requested more convincing explanations on safety improvements or made its own safety review without looking at the regulatory standards and the regulatory authority's decision-making process.[89]

3. Summary

As mentioned in Section IV, since the court's scientific and technical expertise is limited and the decision concerning the socially acceptable level of risk of nuclear technology is more or less associated with a kind of political choice, the Ikata Supreme Court decision respected, to some extent, the decision-making of the regulatory authority, an administrative agency with extensive scientific and technological expertise. However, the Fukushima Daiichi NPP accident was caused by nuclear reactors that met the regulatory standards and held a licence issued by the regulatory authority, and now courts are not easily convinced by the fact that the NRA has reviewed the safety and then issued a licence for the nuclear reactors. These circumstances might explain recent court decisions that did not follow the Ikata Supreme Court decision.

Even those decisions that dismissed claims for injunctions pointed out that the NRA should work to improve public confidence in its decisions and have a process to achieve public understanding of its safety targets and requirements. For example, the Kagoshima District Court stated in its decision:

> The safety targets set by the NRA did not go through national debate and cannot be recognised as social consensus. Thus they were not agreed upon as criteria to decide a publicly acceptable level of risk associated with the construction and operation of a nuclear installation. […] Needless to say, the acceptable level of risk in nuclear power use should be continuously discussed, not only within the NRA but also by the Diet and various other actors in the society.[90]

Additionally, the Fukui District Court decision revoking its earlier decision regarding the Takahama NPP stated:[91]

> Nuclear operators are required to assess risks of nuclear reactors and to ensure safety based on the latest and advanced scientific and technological

88. Fukui District Court decision of 14 April 2015, *Hanreijihou*, No. 2290, p. 13 (Fukui District Court Takahama decision). This decision was revoked by the Fukui District Court, *supra* note 57.
89. In addition to the three district court decisions described in sub-section 2, the Hiroshima High Court has recently granted a provisional injunction against the operation of the Ikata NPP, pointing out that the defendant did not provide sufficient explanation and evidence showing the rationale of the NRA's decision regarding conformity to the regulatory standards: the regulatory standard required that the probability of event be sufficiently small where volcanic activities may affect the NPP over its operational period and the design of the NPP cannot prevent the consequence of such event. Hiroshima High Court decision of 13 December 2017, *Hanreijihou*, No. 2357/2358, p. 300.
90. Kagoshima District Court decision of 22 April 2015, *Hanreijihou*, No. 2290, p. 147. This is the original decision of the Fukuoka High Court decision discussed in sub-section 1 (*supra* note 76).
91. Fukui District Court decision, *supra* note 57. District Courts in Japan can hear an appeal to an injunctive order issued in the same court and revoke it. Although unusual, it is still possible because the judges are different in each case and they may reach different decisions in highly controversial cases.

expertise in various fields. In addition, the NRA, whose executives are composed of a Chairman and Commissioner of high moral standing who are highly experienced or have academic standing on nuclear safety, reviews the safety measures based on their expertise and from independent, neutral and scientific viewpoints. The new regulatory standards can be recognised as rational only when the objective of this system works well; if misconduct exists, the new regulatory standards will lose their rationality. The defendant and the NRA must deny the "myth" that nuclear reactors are absolutely safe and never forget the deep remorse of the Fukushima Daiichi NPP accident. With this attitude, they are required to make continuous effort to update their scientific and technological expertise and to ensure safety at a high level.

VI. Conclusion

This article has summarised Japan's legal framework concerning access to the courts as well as recent court decisions concerning the operation of nuclear reactors. In Japan, only individuals have standing to sue; organisations and groups cannot establish standing. In practice, however, the court tends to admit standing for individuals more flexibly than before and a wide range of people are involved in actions concerning nuclear reactors. In addition, actions for one nuclear reactor can be filed multiple times without any time limit. These overall features ensure access to the courts for ordinary citizens.

The Ikata Supreme Court decision established the framework for administrative cases where a licensing decision for the construction of a nuclear installation is disputed. The judgment, to some extent, respects the scientific and technical decisions of the regulatory authority, the administrative agency with extensive scientific and technological expertise, but tries to exercise some legal control by focusing on the regulatory standards and decision-making process.

There is not yet a Supreme Court decision outlining the framework for civil cases. Some lower court decisions followed the Ikata Supreme Court decision while others did not. In all decisions, however, the NRA's licensing decisions were no longer easily accepted by the court in the aftermath of the Fukushima Daiichi NPP accident. As mentioned above, the Ikata Supreme Court decision respects the expert decisions of the regulatory authority, but the experience of the severe accident has undermined confidence in the regulatory authority, which may affect judges' attitudes towards the NRA's safety review.

The judicial review standards of the Ikata Supreme Court decision will continue to be applicable only if public confidence in the regulatory authority's expert decisions is maintained in our society. As suggested by some recent court decisions, new safety targets and regulatory standards set by the NRA, as well as its restart review process, should help it regain the confidence of our society. Although public participation and information disclosure have not been regarded as major legal issues in construction licensing, these aspects should now attract more concern in the Japanese legal framework.

Inside nuclear baseball: Reflections on the development of the safety conventions

*by Carlton Stoiber**

For many years, I have been lecturing about the conventions and instruments in nuclear law. These lectures have primarily been dedicated to explaining the conventions and instruments section by section and how they relate to nuclear law in practice. Only occasionally is there time to mention some of the background history as to why and how the conventions and instruments emerged as they did.

Very soon, those of us who were involved in the drafting and negotiating process will have to pass the torch onto the next generation, and indeed the next generation after that, of nuclear law experts. But these stories should not be lost to history. Countless legal and technical experts from all over the world were involved in the development of the conventions and instruments in nuclear law and all of us likely experienced and remember it differently.[1] What follows therefore is one person's brief "inside baseball"[2] reflection on the development of the early safety conventions.

1986 Early Notification and Assistance Conventions

In April of 1986, the nuclear world was confronted by the disaster at the Chernobyl reactor in Ukraine, in the former Soviet Union. In response, the IAEA Director-General called for the negotiation of a convention on nuclear safety. The Soviet Union, however, resisted such an initiative, largely because it was felt that the debates would focus on alleged inferiority of the Soviet reactor design. Instead, the nuclear community was able to gain approval to negotiate two legal instruments of a

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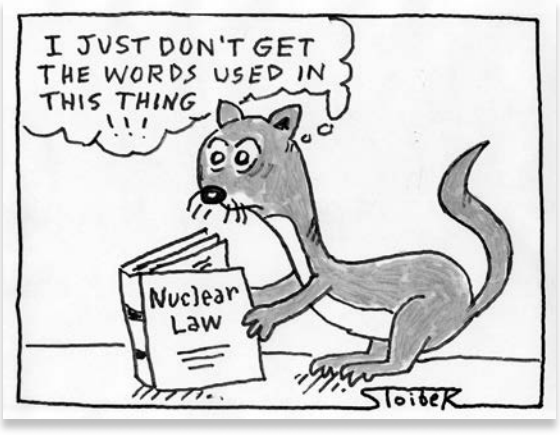
1. It cannot be overstated that this is just one account of many that can be told. People like Wolfram Tonhauser, Dr Odette Jankowitsch-Prevor and Maria de Lourdes Vez Carmona of the International Atomic Energy Agency (IAEA), as well as Julia Schwartz and Patrick Reyners of the OECD Nuclear Energy Agency (NEA) would have many of their own stories to tell.
2. "Inside baseball" is a phrase intended to refer to detailed information that only specialists would be interested in, see e.g. Merriam-Webster (n.d.), "The Inside Scoop on 'Inside Baseball'", available at: www.merriam-webster.com/words-at-play/the-inside-scoop-on-inside-baseball?pagewanted=all&src=pm. Given the nature of the *Nuclear Law Bulletin* and the audience it attracts, this is exactly the place to convey these "inside baseball" accounts.

narrower focus, namely on early notification[3] and assistance in the case of a nuclear accident.[4]

Enforcement

The primary concern of many governments during the negotiations was how to manage the issue of "enforcement" of the obligations of the instruments that, unlike the non-proliferation instruments, would focus primarily on a state's internal nuclear programme. States did not want international bodies, like the IAEA, to be intervening in domestic matters, even in the case of a nuclear accident. States with nuclear power programmes, including the United States and Soviet Union, were particularly concerned about this. One result was the appearance in the text at various points of what some would call "weasel words" – words, like a sneaky weasel, that condition or limit the application of certain provisions. Common among these was the term "appropriate" or "as appropriate", which allows a state to make its own determination about what action to take or information to provide to other parties. The term appears six times in the Early Notification Convention (Articles 2, 5, 8 and 9) and nine times in the Assistance Convention (Articles 1, 2, 3, 5 and 11). Another "weasel" term that appeared is "where practicable" or "as far as reasonably practicable" (twice in both the Early Notification and Assistance Conventions).



Dispute settlement

Another issue of concern to many states was what procedures would be adopted for the settlement of disputes. Article 11 of the Early Notification Convention and Article 13 of the Assistance Convention are identical. The elaborate text sets forth a rather extensive set of procedures to be followed in the event of a dispute over application of the instrument, including consultation, arbitration and possible referral to the International Court of Justice. Another provision allows states, when signing the conventions, to "declare that it does not consider itself bound by either or both of the dispute settlement procedures".[5] So much for dispute resolution.

3. Convention on Early Notification of a Nuclear Accident (1986), IAEA Doc. INFCIRC/335, 1439 UNTS 276, entered into force 27 October 1986 (Early Notification Convention).
4. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986), IAEA Doc. INFCIRC/336, 1457 UNTS 134, entered into force 26 February 1987 (Assistance Convention).
5. Early Notification Convention, Article 11(3); Assistance Convention, Article 13(3).

Summary

All of these aspects – the narrower focus, lack of enforcement measures and weak dispute resolution procedures – provided for an almost harmless text to agree to. Thus, they were adopted quite quickly after negotiations began.[6] This being said, although it may be difficult for nuclear lawyers to recall it now, 30-plus years ago, these conventions represented a major step forward in international relations for nuclear energy. This is explained best by Professor Berthold Moser in his 1989 article on the conventions:

> The two IAEA conventions represent a considerable advance on the previous legal situation since early notification of a nuclear accident and assistance in the event of a nuclear accident or radiological emergency considerably reduce the risk to other countries and often make it easier to repair the damage. After the Chernobyl accident, the consent of the States affected was forthcoming only after great hesitation so that it was relatively late before the necessary protective measures could be taken. Nor did any prior arrangements exist for assistance from other countries, so that help from outside was the exception. Let us hope that the two IAEA conventions rarely have to be applied and that, should a nuclear accident or radiological emergency occur, it will be on a far smaller scale than the Chernobyl disaster.[7]

1994 Convention on Nuclear Safety (CNS)

Moving on from the more limited Early Notification and Assistance Conventions, the early 1990s saw a revival of interest in a broader nuclear safety convention by a large number of states, both those with nuclear programmes and those without such programmes. Two factors seem to have been at work. First, the collapse of the Soviet Union in December of 1991 reduced Russian resistance to a broader instrument. And second, the expanding nuclear programmes around the world caused states, particularly those non-nuclear states with facilities built or planned near their borders, to seek legal provisions enhancing safety, including their ability to participate in safety reviews.

In 1995 I wrote an article that touched on some aspects of the negotiations of what became the CNS that I delivered at that year's International Nuclear Law Association (INLA) Congress in Helsinki,[8] but I would like to expand on a few issues that we dealt with during the drafting and approval process for the CNS.

Scope of coverage

The first is a threshold issue that must be addressed in drafting any legal instrument; namely, what should be its scope of coverage. Although it was obvious

6. Entry into force for the conventions was quite quick as well and now the conventions currently have wide coverage with 121 parties, as of May 2018, for the Early Notification Convention and 116 parties for the Assistance Convention.
7. Moser, B. (1989), "The IAEA Conventions on Early Notification of a Nuclear Accident and on Assistance in the Case of a Nuclear Accident or Radiological Emergency", *Nuclear Law Bulletin*, No. 44, OECD, Paris, pp. 10-23, 21. The most recent test case was the Fukushima Daiichi nuclear power plant accident, and in this case, Japan did not invoke the Assistance Convention but did provide information in accordance with Article 3 of the Early Notification Convention. IAEA (2011), "IAEA Activities in Response to the Fukushima Accident: Report by the Director General", IAEA Doc. GOV/INF/2011/8, p.1, fn. 2.
8. Stoiber, C. (1995), "The Convention on Nuclear Safety: An Introduction", in INLA, *Nuclear Inter Jura '95: Nuclear Law as a Source of Confidence – Le Droit Nucléaire, Source de Confiance*, Helsinki, pp. 655-669, available at: http://aidn-inla.be/content/uploads/2014/03/1995-helsinki.pdf.

that the new convention should cover nuclear power reactors, a number of states – particularly those in the Nordic region, such as Sweden – also wanted the instrument to cover nuclear waste management. This was opposed by a number of other states, largely because of the impact of including the two complex subjects of the safety of both nuclear facilities and waste in the same instrument. It was expected that the CNS regime would involve a review conference (RevCon) process, like that in other instruments like the Nuclear Non-Proliferation Treaty.[9] Many states felt that trying to conduct a review of both complex subjects in one RevCon would be too difficult, costly and time-consuming.

The issue was resolved in two ways. First, the CNS definition of nuclear installation covers "storage, handling and treatment facilities for radioactive materials as are on the same site and are directly related to the operation of a nuclear power plant", presumably including materials considered to be waste.[10] Second, the CNS Preamble includes a political commitment that "development of current or future international instruments" "in connection with the safety of other parts of the nuclear fuel cycle" might be considered.[11] This commitment was, of course, implemented through the negotiation of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste.[12]

Type of facilities

Another important issue of scope that needed early resolution was what kind of nuclear facilities should be covered. This was very actively debated because some states wanted a rather broad scope covering several types of nuclear facilities (such

9. Treaty on the Non-Proliferation of Nuclear Weapons (1968), IAEA Doc. INFCIRC/140, 729 UNTS 169, entered into force 5 March 1970 (NPT).
10. CNS, Article 2(i).
11. CNS, Preamble para. (x).
12. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).

as research reactors, nuclear-powered ships, production reactors, military reactors, as well as civil power reactors). The issue was finally resolved in the definition of "nuclear installation" to cover "any land-based civil nuclear power plant under its jurisdiction".[13] Here again, this narrower scope was adopted to focus the review process on facilities that would pose the greatest safety risks.

Ensuring safety

Another hot topic involved the key role of regulatory bodies in ensuring the safety of nuclear installations. Because the structure and functions of regulatory bodies differed considerably among states, the issue was whether and how to define the so-called "independence" of regulatory bodies from other interested entities, particularly industry, but also including other governmental bodies with promotional roles.

First, we had to decide whether to include the term "independence" itself in the CNS text. Many states argued that the term was ambiguous, particularly when translated into languages other than English or French. The result was the adoption of text in CNS Article 8, "Regulatory Body" whereby "Each Contracting Party shall take the appropriate steps to ensure an effective separation between the functions of the regulatory body and those of any other body or organization concerned with the promotion or utilization of nuclear energy". No definition or explanation of what constitutes an "effective separation" was provided.

As noted above with regard to the Early Notification and Assistance Conventions, this provision includes the "weasel word" of "appropriate", in addition to others such as the "effective separation" of functions. Article 8(1) is broadly worded to permit different states to adopt different regulatory regimes by simply requiring that states establish a regulatory body "with adequate authority, competence and financial and human resources to fulfil its assigned responsibilities". Again, we see the "weasel word" of "adequate". Article 10 on Priority to Safety also "weasels" a bit by stating that "Each Contracting Party … shall establish policies that give due priority to nuclear safety", which is simply another way of saying "adequate priority".

Although it may feel inadequate, without this limiting language, it would have been difficult to gain consensus on the text of the CNS.

Enforcement

Another issue that arose in the negotiation of the CNS was its basic character. Several states wondered how they should describe the Convention's impact when it did not include the kind of enforcement measures contained in other nuclear instruments – for example, safeguards under the NPT. Late in the negotiations, the French delegation offered a solution that was readily accepted. The French felt the CNS should be considered an "incentive" instrument where states would be pressured to adopt and implement its provisions through the reporting and review meeting process.[14] States would not want to have their national reports criticised in

13. CNS, Article 2(i).
14. As explained by Dr Odette Jankowitsch-Prevor, "The term "incentive", though not defined, was inserted in the Preamble of the Convention and is not to be understood in a material sense, but rather as synonymous with "encouragement" or "emulation". Jankowitsch, O. (1994), "The Convention on Nuclear Safety", *Nuclear Law Bulletin*, No. 54, OECD, Paris, pp. 9-22, 13. Dr Jankowitsch-Prevor was also instrumental in the drafting of the CNS and her 1994 *Nuclear Law Bulletin* article provides interesting background information on the drafting and negotiation process. For further analysis of the incentive concept, see De Wright, T. (2007), "The 'Incentive' Concept as Developed in the Nuclear Safety Conventions and its Possible Extension to Other Sectors", *Nuclear Law Bulletin*, No. 80, OECD, Paris, pp. 29-47.

Review Meetings as inadequate or erroneous. So "incentive" became the adjective that now describes the basic character of the CNS.

Review meetings

After adoption of the CNS, the contracting parties then needed to proceed with the review process set forth in Chapter 3, "Meetings of the Contracting Parties". A key subject in this regard was how the review meeting should be organised to efficiently conduct a gathering of a large number of states with different legal and political systems, interests and nuclear activities. As with the NPT, it was clear that conducting the reviews of national reports on compliance with the CNS could not be practically conducted in large plenary sessions. So, the parties needed to determine how to implement Article 20(2) providing that sub-groups of the contracting parties "may be established and may function during the review meetings as deemed necessary for the purpose of reviewing specific subjects contained in the reports".

This language seemed to many states as mandating the establishment of groups addressing specific subjects in the Convention, such as emergency preparedness (Article 16) or siting (Article 17) or design and construction (Article 18) or operation (Article 19). From a different perspective, some states wanted sub-groups organised on a regional basis to involve neighbouring states. Others wanted sub-groups organised to address specific reactor types, such as those of American or Russian or European design. Others wanted the groups to be diverse, including states from different regions, utilising different designs and considering all the subjects in the CNS. At one of the preparatory conferences I suggested an approach that might achieve consensus that I somewhat jokingly called the "Tennis Seeding Method".

I took this from the way tennis players were assigned in competitions based on a formula, such as how many victories they had achieved in the previous year. My proposal was to determine how many working groups should practically be established at a RevCon to efficiently engage the total number of contracting parties in attendance. I suggested that parties be organised by the number of nuclear facilities they possessed and that the state with the largest number (at that time, the US) should be assigned to Group 1 and the state with the second largest number (France) should be assigned to Group 2, and so forth. After all the nuclear power states were assigned, the others should be assigned to various groups by pulling their names out of a hat or box. This would create diverse groups to review the entire scope of the CNS. To my surprise, the Tennis Seeding Method was

enthusiastically accepted by most contracting parties and has been used at Review Meetings since the first one.

Summary

In 1994, Dr Jankowitsch-Prevor ended her article on the CNS on a hopeful note, optimistic that

> [d]espite the apparent technical character of the Convention, the negotiators and drafters have achieved the establishment of an instrument that can be implemented by countries with very different industrial, regulatory and legal systems at different stages of development, and even with widely differing approaches to nuclear power.[15]

The CNS's 84 parties, over half of whom have no nuclear power plants in operation, includes virtually every country with at least one nuclear power plant.[16] Although the CNS may not have a strong enforcement mechanism, it is clear after the many debates and discussions, we were able to put together a convention where the scope of coverage, types of facilities covered, concepts of ensuring safety and review meeting process presented a robust format for many countries to come together to work towards the common objective "to achieve and maintain a high level of nuclear safety worldwide".[17]

1997 Joint Convention on Spent Fuel and Radioactive Waste Management

As with the CNS, difficult threshold issues of scope and definitions needed to be addressed in drafting the Joint Convention. Primary among these was whether the Joint Convention should cover spent fuel, which many states did not (and still do not) consider as "waste". It was finally decided to cover both spent fuel and nuclear

15. Jankowitsch, O. (1994), *supra* note 16, p. 19.
16. IAEA (2017), Status, Convention on Nuclear Safety, available at: www.iaea.org/Publications/Documents/Conventions/nuclearsafety_status.pdf (accessed 2 May 2018).
17. CNS, Article 1(1).

material considered to be waste by a contracting party.[18] Also, given that waste management in most countries is managed by the government, rather than private companies, relevant provisions refer to the state as having ultimate responsibility for ensuring safety.[19] And, as in the CNS, military and defence activities are excluded in Preamble, although materials in those activities should be "managed in accordance with the objectives" of the Joint Convention.[20]

An interesting difference, however, between the CNS and the Joint Convention was the agreement to specifically reference the term "independence" in Article 20(2) on the Regulatory Body.[21] The term is used instead of "separation" of regulatory functions from other organisations involved in spent fuel or waste management. The basic reason for this difference is that in some states, the same governmental organisation involved in waste management also includes a division or office dealing with safety. But, like the CNS, weasel words like "effective" and "appropriate" still found their way in.

A very strongly debated provision in the Joint Convention is contained in paragraph xii of the Preamble stating that "any State has the right to ban import into its territory of foreign spent fuel and radioactive waste". Some states argued that this rather political statement was not necessary to include in the Convention because it only recognises an inherent right of state sovereignty. However, it was agreed to include it, but only in the Preamble, as a means of persuading non-nuclear states to adhere to the Convention.

Otherwise, it is of interest that the Joint Convention's procedural articles basically reproduce those of the CNS. These include the provisions related to reporting and participation in review meetings. It was felt that the two instruments should be basically consistent on these matters, to avoid confusion about how the two conventions were to be implemented.

Unlike her earlier article on the CNS, Dr Jankowitsch-Prevor's foundational article with Mr Tonhauser on the Joint Convention ended with a less confident outlook. To the authors, the adoption of the Notification and Assistance Conventions, along with the CNS and Joint Convention, were great steps forward in completing a "*corpus juris*" on "the international law of nuclear safety", but these are by no means the final steps.[22] More work would be needed, and in fact still is, to give these instruments their full potential.[23]

18. This issue, as well as others mentioned in this section, are addressed in greater detail in the excellent 1997 article by Wolfram Tonhauser and Dr Jankowitsch-Prevor in *Nuclear Law Bulletin* No. 60, "The Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management", OECD, Paris, pp. 9-22.
19. Joint Convention, Preamble para. (vi) reaffirms "that the ultimate responsibility for ensuring the safety of spent fuel and radioactive waste management rests with the State", while Article 21 states that "Each Contracting Party shall ensure that prime responsibility for the safety of spent fuel or radioactive waste management rests with the holder of the relevant licence and shall take the appropriate steps to ensure that each such licence holder meets its responsibility" and that "[i]f there is no such licence holder or other responsible party, the responsibility rests with the Contracting Party which has jurisdiction over the spent fuel or over the radioactive waste."
20. Joint Convention, Preamble para. (viii).
21. "Each Contracting Party, in accordance with its legislative and regulatory framework, shall take the appropriate steps to ensure the effective independence of the regulatory functions from other functions where organizations are involved in both spent fuel or radioactive waste management and in their regulation."
22. Tonhauser and Jankowitsch (1997), *supra* note 19, p. 22.
23. See id.

Some Lessons Learnt

Given that our work in this field is not done, it is beneficial to review the lessons learnt in the drafting and negotiation process of the safety conventions. With each, a basic process emerged that is still highly relevant to this day. In my view, the following ten points are the main elements of a successful process for the creation of nuclear law instruments:

1. *Identify the problem(s) or subject to be addressed.*

   For example, these could include safety, security, waste management, transport, transboundary impacts, environmental impacts, financing, liability for damage, just to name some of the more obvious. I have discussed some of the examples of sorting out the subject or subjects of an instrument. The most obvious was the debate about whether to cover both reactor safety and waste management in the CNS and whether to include both spent fuel and radioactive waste managements in what became the Joint Convention.

2. *Assess the context of the existing legal framework and need for additional or supplementary instruments, arrangements or amendments to address gaps or weaknesses in the legal structure.*

   One example of this is the adoption the Vienna Declaration on Nuclear Safety by a majority of the CNS parties in 2015,[24] which is a *de facto* amendment to the Convention.

3. *Consult with a broad range of interested parties: national governments; relevant international organisations; industry; non-governmental organisations; press; members of the public; other relevant stakeholders.*

   The development of the CNS is an example of how broad consultation was essential in achieving an acceptable text. In that process, the consultation included industry; regulatory bodies; environmental organisations; states with nuclear power facilities, as well as those planning such facilities, and neighbouring states. Major international organisations that could be consulted in future nuclear law initiatives include: the World Nuclear Association (WNA) (for industry);[25] the International Nuclear Regulators' Association (INRA);[26] INLA;[27] the World Institute for Nuclear Security (WINS);[28] and, of course, the IAEA and the NEA.

24. IAEA (2015), "Vienna Declaration on Nuclear Safety: On principles for the implementation of the objective of the Convention on Nuclear Safety to prevent accidents and mitigate radiological consequences", IAEA Doc. INFCIRC/872.
25. The WNA is an organisation with members representing the entire fuel cycle with a mission "to promote a wider understanding of nuclear energy among key international influencers by producing authoritative information, developing common industry positions, and contributing to the energy debate". WNA (2018), "Our Mission", www.world-nuclear.org/our-association/who-we-are/mission.aspx.
26. INRA "was established in January 1997 and is an association that comprises the most senior officials of the nuclear regulatory authorities of the following countries: Canada, France, Germany, Japan, South Korea, Spain, Sweden, the United Kingdom, and the United States of America. The main purpose of the association is to influence and enhance nuclear safety, from the regulatory prospective, among its members and worldwide." NRC (2017), "International Organizations", www.nrc.gov/about-nrc/ip/intl-organizations.html#INRA.

4. *Determine the most appropriate document or arrangement given legal, technical and policy considerations. Among the most relevant considerations are:*

   - legally binding international instruments: treaties, conventions or agreements;
   - politically binding guidelines;
   - standards or procedures for interpreting or revising existing instruments;
   - enforcement measures (such as inspections, monetary penalties, license revocation or suspension and the like);
   - models or structures for national legislation and regulations;
   - reports of relevant agencies or bodies; and
   - measures for developing needed resources (technical, economic, administrative).

   The consultation mentioned in paragraph 3, above, will determine which kind of instrument would be accepted by the largest number of interested parties. It is not helpful to negotiate an instrument that cannot or will not be adopted or implemented effectively by relevant states or organisations.

5. *Develop an initial draft of a relevant document with possible options for key elements.*

   Initial drafting is usually conducted by a single individual (as I did in a number of cases) or a small group. This work, although by a government official, is not considered to reflect the position of a government. It merely produces an informal draft for further consideration. The initial text is then reviewed and amended by increasingly larger groups until it is decided to move to formal negotiations by governments. Depending on the subject matter and political interests behind the initiative, the early drafting process can take many months or years. This should not discourage the drafters.

6. *Convene preparatory meeting(s) to review elements, draft text and process for moving forward.*

   Preparatory meetings or conferences (PrepComs) will typically involve representatives of national governments, but their conclusions are not deemed legally binding on participating states. The CNS involved some nine of these PrepComs and could well have involved even more if the interested governments had not decided that "enough is enough" and that formal negotiations should be scheduled.

27. Founded in 1970, INLA's mission is "the promotion and pursuit, on an international level, of studies and knowledge of legal issues related to the peaceful utilisation of nuclear energy, with a focus on protecting persons, property and the environment; the exchange of information between members of the Association; and scientific co-operation with other organisations having similar objectives." INLA (n.d.), "History & Mission", http://aidn-inla.be/about-inla/history-mission/.
28. Established in 2008 on the margins of the IAEA General Conference, WINS is a non-governmental membership organisation in Vienna, Austria "committed to building an international community of nuclear security professionals who are demonstrably competent and willing to work together to strengthen the security of nuclear and other radioactive materials." WINS (n.d.), "About Us", https://wins.org/about-us/.

7. *Convene negotiating session(s) to produce an acceptable text.*

   It is quite useful in organising negotiating meetings or conferences to have them supervised or managed by an international organisation such as the IAEA or the NEA. The advantages are many, including involvement by an informed staff, availability of conference facilities, and assistance in travel or accommodation arrangements, documentation and many other factors.

8. *Convene a meeting by an appropriate official or relevant organisation to adopt the text of an instrument or procedural arrangement.*

   As with comment 7, above, the same can be said here.

9. *Pursue diplomatic efforts to secure necessary approvals for entry into force of the instrument or arrangement.*

   Diplomatic efforts are unlikely to be efficient or successful if conducted by a single entity. Convincing a sufficient number of states to adhere to an instrument typically requires appeals (often called *démarches*) by a number of states or entities. This has been my experience with all of the nuclear instruments I have worked on.

10. *Provide for periodic review procedures to evaluate the success or value of the instrument or arrangement.*

    Many aspects need to be considered regarding the review process for a nuclear instrument. These include the intervals between review meetings, the nature of documents to be produced at the meetings and the approval process – just to name a few. In my experience, the issue of approval of a report or other document concerning whether and how an instrument has been successful can be complex. Governments typically want to achieve a consensus of views on major issues. Approval of a consensus document requiring unanimity of participants can be very difficult and time-consuming.

    In fact, unanimity can result in one or a few participants "holding hostage" the process of achieving consensus unless a particular issue is decided in favour of the "hold out" state or states. Participants in a large meeting obviously want the meeting to adhere to the schedule adopted. Representatives have other responsibilities and commitments beyond a single meeting, however important. This can encourage obstruction of a process that otherwise has broad consensus. However, voting by a majority or other fraction of participating states can create diplomatic or political tensions that may undermine support for an instrument and its regime. Most nuclear review

meetings have adopted the unanimity concept for final reports. This has thankfully not created major problems in the nuclear safety field.[29]

Conclusion

My final thoughts, as usual, are best summarised in a cartoon…

In the drafting and negotiating process, whether for an international convention or a contract between two private parties, be aware that someday you may be called upon to explain the how and the why of the language used. Choose your words carefully, because what you write can have a significant effect on the development of nuclear law.

29. This is not always the case in every field. In the field of non-proliferation, the requirement for unanimity did in fact result in the failure of the 2015 NPT Review Conference to adopt a final document.

Note: The majority of the cartoons included in this article were penned by the author during the nine working group sessions for the negotiation of the CNS. The ones selected for this article are only a small sample of the 500 or more devoted to the CNS. The author hopes they brought a smile – or even a laugh – to the reader.

The Peaceful Nuclear Energy Program in the United Arab Emirates: Background and history

*by Amani Al Shamsi**

Introduction

Nations around the world will require a significant increase in clean, safe sources of electrical power over the next several generations to meet the needs of their citizens and to protect the environment. The United Arab Emirates' (UAE) interest in evaluating nuclear energy was motivated by the need to develop additional sources of electricity to meet future demand projections and to ensure the continued rapid development of its economy.

In 2007, the UAE began assessing the possibility of developing a peaceful nuclear energy programme. In a study released that year, the UAE Government found that existing and planned electricity generation would not meet growing demand, which presented a significant challenge for the country. Reviewed against several options, the UAE concluded that nuclear power generation would be the most reliable, efficient, safe, commercially competitive and environmentally friendly means of producing electricity and meeting demand. The UAE's main objective in developing a nuclear programme is to use nuclear power for electricity production and ensure that it is implemented in a safe and secure manner. The UAE has embarked for the first time on a nuclear energy programme and, in doing so the country adheres to the highest international standards in all areas of its programme.

To this end, the UAE established the foundation for a sustainable national infrastructure to render governmental, legal, regulatory, managerial, technological, human and industrial support for the nuclear programme throughout its life cycle. The UAE complies with international obligations, internationally accepted nuclear safety standards, security guidelines and safeguards requirements, all of which are essential for establishing a responsible nuclear power programme. The UAE is a signatory to all major international agreements in the areas of nuclear non-proliferation, nuclear safety and security. The country's commitment to these principles is the foundation of its nuclear energy policy.

UAE nuclear policy

Recognising the potential role of nuclear energy as an indispensable part of the UAE's future energy strategy, the UAE Government developed and issued an in-depth policy paper entitled, *Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy*.[1] This policy paper, also known as the "Nuclear Policy", was adopted by the UAE Cabinet of Ministers and published in April 2008. The Nuclear Policy outlines the Government's approach to civilian nuclear

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1. Policy of the United Arab Emirates on the Evaluation and Potential Development of Peaceful Nuclear Energy (2008) (Nuclear Policy), available at: www.fanr.gov.ae/en/Lists/LawOfNuclear/Attachments/2/20100523_nuclear-policy-eng.pdf.

power, including the role of nuclear energy in the UAE's energy strategy and the country's commitment to operational transparency and the highest standards of non-proliferation, safety and security. The Nuclear Policy principles and commitments were made into law when the UAE issued Federal Law by Decree No. 6 of 2009 Concerning the Peaceful Uses of Nuclear Energy in October 2009.[2]

To make its intentions clear, the Nuclear Policy emphasised six key principles regarding the potential establishment of a peaceful civilian nuclear energy programme in the UAE:

> The UAE is committed to complete operational transparency.
>
> The UAE is committed to pursuing the highest standards of non-proliferation.
>
> The UAE is committed to the highest standards of safety and security.
>
> The UAE will work directly with the [International Atomic Energy Agency (IAEA)] and conform to its standards in evaluating and potentially establishing a nuclear energy program.
>
> The UAE hopes to develop any peaceful domestic nuclear power capability in partnership with the Governments and firms of responsible nations, as well with the assistance of appropriate expert organizations.
>
> The UAE will approach any peaceful domestic nuclear power program in a manner that best ensures long-term sustainability.[3]

In addition to these commitments, the Nuclear Policy includes the UAE's decision to forgo domestic enrichment and reprocessing of nuclear fuel and describes the role of nuclear power as one component of the UAE's future energy portfolio.

The UAE approach has been praised as a model for how to introduce a transparent, safe and secure domestic nuclear energy programme. As a first step in its commitment to complete operational transparency, and in accordance with guidance from the IAEA, the UAE established a Nuclear Energy Programme Implementing Organization (NEPIO), which evaluated and is implementing the nuclear energy programme in the UAE. As a second step in its commitment to operational transparency, the UAE concluded the required international instruments and strictly abides by the resulting obligations.[4] The UAE provides the necessary domestic complement to every international instrument, and ensures their direct and complete transposition into the UAE national law.

Finally, aware of the issues raised by nuclear power in respect of health, safety and the environment, and desiring that decisions leading to the potential development of nuclear power be grounded in the acceptance of its citizens, the UAE actively engages with and informs the public.

2. Federal Law by Decree No. 6 of 2009 Concerning the Peaceful Uses of Nuclear Energy (Nuclear Law). An unofficial English translation of the Nuclear Law is available at: www.fanr.gov.ae/en/Lists/LawOfNuclear/Attachments/1/20101024_nuclear-law-scan-eng.pdf.
3. *Ibid.*, p. 1.
4. To be discussed *infra*.

Organisation and structure

A. *Federal Authority for Nuclear Regulation (FANR)*

FANR was established in September 2009 under the Nuclear Law as the regulatory body for the nuclear sector in the UAE. FANR protects the UAE's public, its workers and the environment with nuclear regulatory programmes in safety, security, radiological protection and safeguards, which include key objectives in licensing and inspection in accordance with the best international practices. FANR also oversees the implementation of the UAE's obligations under international treaties, conventions and agreements in the nuclear sector, and determines administrative standards, which support excellence in regulation.

FANR has achieved remarkable success in the UAE Peaceful Nuclear Energy Program through transparency in its operations and a dedication to sustainability through the capacity building of Emiratis in the nuclear sector at FANR. Furthermore, FANR has also gained international recognition as a competent regulatory body and for its close co-operation with the IAEA. In establishing its nuclear energy programme, the UAE enlisted the assistance of the IAEA and other competent bodies to ensure that the UAE's approach to fostering the independence, capability and competence of FANR fully reflects current international best practices. Conscious of its critical role in maintaining credibility through independence and competence, the Nuclear Law gave FANR the following IAEA-recommended powers:

1. establishing requirements and regulations;
2. issuing licences;
3. inspecting and assessing facilities and structures connected to facilities;
4. monitoring and enforcing compliance with regulations; and
5. establishing a state system for accounting and control of nuclear material (including spent fuel and radioactive waste) in accordance with IAEA safeguards obligations.

Among its other duties, FANR is also tasked with communicating with the IAEA on an ongoing basis to provide, for example, reports required by international agreements signed by the UAE as well as technical information concerning nuclear material and facilities.

B. *Emirates Nuclear Energy Corporation (ENEC)*

The Emirates Nuclear Energy Corporation was established in December 2009 by Abu Dhabi Law No. (21) of 2009, Establishing the Emirates Nuclear Energy Corporation, issued on 20 December 2009 (ENEC Law). The organisation is charged with implementing the UAE Peaceful Nuclear Energy Program as it delivers the nuclear power plant (NPP) that will produce electricity, supports economic development and provides opportunity for the people of the UAE. To this end, ENEC is:

1. working closely with the Abu Dhabi and UAE federal governments to ensure that the UAE Peaceful Nuclear Energy Program is aligned with the industrial infrastructure plans of the UAE;
2. developing the human resource capacity for the nuclear energy programme in co-ordination with the educational sector in the UAE; and
3. effectively engaging with the UAE community to ensure a high level of awareness and understanding about the programme and the role of nuclear energy in the nation's energy portfolio.

ENEC also serves as the investment arm of the Government of Abu Dhabi, making strategic investments in the nuclear sector, both domestically and internationally. ENEC commissioned and directed the studies and research required to fully evaluate the potential development of a peaceful nuclear power sector in the UAE. ENEC is also charged with directing the programmes and initiatives to develop the necessary human, technical and security infrastructure (including for the secure transport of nuclear materials and equipment) that would be required to support a safe and secure domestic nuclear power sector.

Since its inception, ENEC has been working to deliver safe, clean, reliable and efficient nuclear energy to the nation. In April 2010, ENEC selected the Barakah site in the Al Dhafra Region of Abu Dhabi for construction of the UAE's first NPP. Two years later, ENEC received a construction licence from FANR, for the construction of Barakah NPP Units 1 and 2. A second was issued in 2014 for the construction of Units 3 and 4. Once operational, the four nuclear power generating units will have a combined capacity of approximately 5 600 megawatt (MW) and will prevent the release of 21 million tons of carbon emissions annually.

The UAE began construction of Unit 1 in July 2012, followed by Unit 2 in 2013, Unit 3 in 2014 and Unit 4 in 2015. Construction of Units 2 through 4 is continuing in 2018 while Unit 1 is undergoing commissioning testing and is preparing for fuel load. The fuel is securely stored on site while the organisation ensures the first unit is operationally ready prior to loading fuel and proceeding with the remaining commissioning and testing activities. This is in line with the highest standards for NPP operation as promulgated by the World Association of Nuclear Operators (WANO), of which ENEC is a member of WANO's Atlanta Centre, and the US Institute for Nuclear Power Operations (INPO).

In addition to holding the construction licences for the project, ENEC also provides construction oversight and contract management services and leads the joint venture companies responsible for operating the NPP and the long-term sustainability of the programme. ENEC remains the title owner to both the Barakah site and the Barakah NPP.

C. Korea Electric Power Corporation (KEPCO)

The prime contractor selection process was designed to identify the best long-term partner for the UAE as it undertakes its nuclear energy programme. The process was guided by the Nuclear Policy, which set strict standards for safety and security, non-proliferation and sustainability. A team of more than 75 dedicated experts evaluated the bids for the UAE's first NPP. Collectively, the team had more than 900 years of directly relevant experience in NPP safety, design and construction; operations and maintenance; nuclear quality assurance, supply chain management and procurement; nuclear fuel management; siting analysis (including environmental impact assessment, seismology, geology, meteorology and hydrology); finance (including generation cost modelling and project finance); legal and contracting; programme management; utility operations; and communications and community relations.

After this thorough review process, ENEC selected KEPCO as the prime contractor in December 2009 to design, build and jointly operate the four 1 400 MW civil nuclear power reactors at the Barakah site. The value of the contract equalled approximately USD 20 billion, with a high percentage of the contract being offered under a fixed-price arrangement. KEPCO is Korea's largest public power electric utility with more than 40 years of experience in nuclear technology and NPP operation. KEPCO has developed a strong record for constructing nuclear power plants that meet stringent industry quality standards and are delivered on time and on budget.

KEPCO's APR1400 design is a third-generation, 1 400 MW pressurised water reactor (PWR). This design combines the latest developments in safety and performance with technology proven over decades of operations. The APR1400 is based on the System 80+ design, previously certified by the United States Nuclear Regulatory Commission (US NRC). The design has been adapted to suit the UAE's unique climate conditions and FANR's specific requirements. KEPCO submitted the APR1400 design to the US NRC for certification, which is undergoing review.

In 2016, ENEC signed a joint venture agreement with KEPCO that aims to ensure the long-term sustainable operation and commercial viability of the Barakah NPP. This agreement is an unprecedented partnership between two countries in the field of nuclear energy and is designed to successfully develop and operate a nuclear energy programme in adherence to the highest standards of safety, quality, security and operational transparency. The joint venture also established two subsidiary companies: Nawah Energy Company, the company responsible for operating the four Barakah units, and Barakah One Company (BOC), which manages the NPP's commercial interests. ENEC is the majority shareholder with 82%, while KEPCO holds an 18% stake in each company.

In parallel with the construction project, extensive training, human resource development, and education programmes have been launched as the UAE builds the capacity to staff the vast majority of the nuclear energy programme elements with national talent and develops the industrial infrastructure and commercial businesses to serve a thriving nuclear energy industry.

D. Nawah Energy Company (Nawah)

Nawah was incorporated in 2016 as a private joint stock company and is a joint venture between ENEC and KEPCO. Nawah is a multinational, multicultural and Emirati-led company, fostering the next generation of nuclear energy leaders in the UAE. It provides top national and international talent with a diverse, fast-paced and dynamic work environment where they can grow and develop.

Nawah was created to operate the four reactors at the Barakah site on behalf of ENEC via arrangements with Barakah One Company (BOC) via a plant services agreement (PSA). Under the PSA, Nawah is responsible for managing, operating, maintaining and eventually decommissioning the reactors at Barakah. Nawah is being developed into a fully staffed and qualified nuclear operator and works closely with KEPCO subsidiaries to operate and maintain the NPP.

E. Barakah One Company (BOC)

Established as a joint venture company, BOC is a part of ENEC's new corporate governance structure that will lead the delivery and long-term sustainability of the UAE Peaceful Nuclear Energy Program. Its mandate is to manage the commercial interests of the Barakah project, secure project finance from institutional and commercial lenders, and receive funds for the electricity generated from Barakah Units 1 through 4.

In October 2016, ENEC and KEPCO announced the financial close of the Barakah project. This deal is an important milestone and evidences the continued diversification of the Abu Dhabi energy sector. The support from credit agencies and commercial banks to the programme is a reflection of the robust project management and quality of the programme. Project financing was provided via direct loans from the Government of Abu Dhabi and the Export-Import Bank of Korea, loan agreements with five local and international commercial banks, and equity commitments for the establishment of the BOC in exchange for equity interest in the company, shared between ENEC and KEPCO. The BOC financing is the largest financing for a power project in the world and the first hybrid sovereign/project

financing structure for a contemporary new-build nuclear power station. It is also one of the largest joint venture transactions underpinning a contemporary new nuclear programme and the largest power deal in the Gulf region by far.

In November 2016, BOC signed the first nuclear energy power purchase agreement with Abu Dhabi Water and Electricity Company for the purchase of the nuclear-generated safe, clean, efficient and reliable electricity produced at the Barakah NPP.

International co-operation

The UAE established its Permanent Mission of the UAE to the IAEA in Vienna, Austria in 2008 to work closely with the IAEA. The objective of the Mission is to advance the interests of the UAE government in the area of peaceful uses of nuclear energy through effective diplomacy, negotiations, and daily engagement with the IAEA and the Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), and to facilitate co-operation in nuclear safety, nuclear security, non-proliferation, safeguards, technical co-operation, and implementation of relevant international obligations. Through its active engagement with the international organisations in Vienna, the Mission represents the UAE government in various *fora*, including the IAEA General Conference, the IAEA Board of Governors, meetings on international conventions, IAEA committees and working groups, review conferences, CTBTO Preparatory Commission meetings, and others.

The Permanent Mission co-ordinates the implementation of international obligations stemming from agreements and conventions signed by the UAE with the IAEA. The Mission oversees the submission of required national reports and declarations, presents the UAE's efforts in implementing the provisions of the conventions and agreements and co-ordinates Technical Cooperation (TC) project implementation among national stakeholders. The UAE recognises the important role that the IAEA plays in facilitating the implementation of effective programmes aimed at improving the scientific and technological capabilities of member states. The UAE strongly supports the IAEA's TC programme, which assists its member states, including the UAE, in obtaining technical expertise in the areas of nuclear energy, nuclear security, nuclear safety and other nuclear applications in various fields.

The Permanent Mission assumes the role of National Liaison Officer, which constitutes the official channel through which the UAE partakes in IAEA activities, but also provides guidance to the Agency's TC Programme through General Conference resolutions and Board Decisions. The Mission facilitates dialogue with key national stakeholders in the TC programme, and supports human resource development in the nuclear field, through co-ordinating the participation of delegates and experts from the UAE in IAEA meetings and trainings. Furthermore, it oversees the planning and implementation of national and regional TC projects with the IAEA.

In addition to the UAE's co-operation with international organisations, the UAE has also signed a number of bilateral agreements for co-operation in the field of peaceful nuclear energy with numerous countries, including Argentina, Australia, Canada, France, Japan, Korea, the Russian Federation, the United Kingdom and the United States.

Adopted international agreements

The UAE has subscribed to all international instruments, treaties, agreements and conventions in connection with nuclear energy, nuclear safety, nuclear security and non-proliferation. In the 30 years prior to the deployment of the nuclear energy programme, the UAE joined/concluded/implemented eight international agreements. With the announcement of its nuclear energy programme and establishment of the Permanent Mission in 2008, the UAE joined seven additional international agreements.

The UAE is a party to all major international conventions and agreements under the auspices of the IAEA, including the:

- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (acceded, 2 October 1987);[5]
- Convention on Early Notification of a Nuclear Accident (acceded, 2 October 1987);[6]
- Treaty on the Non-Proliferation of Nuclear Weapons (acceded, 26 September 1995);[7]
- Comprehensive Nuclear-Test-Ban Treaty (ratified, 18 September 2000);[8]
- Comprehensive Safeguards Agreement between the UAE and the IAEA (signed, 15 December 2002);[9]
- Convention on the Physical Protection of Nuclear Material (acceded, 16 October 2003);[10]
- United Nations Security Council Resolution 1540 (implemented, first report submitted 2004);[11]
- International Convention for the Suppression of Acts of Nuclear Terrorism (acceded, 10 January 2008);[12]

5. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1986), IAEA Doc. INFCIRC/336, 1457 UNTS 134, entered into force 26 February 1987 (Assistance Convention).
6. Convention on Early Notification of a Nuclear Accident (1986), IAEA Doc. INFCIRC/335, 1439 UNTS 276, entered into force 27 October 1986 (Early Notification Convention).
7. Treaty on the Non-Proliferation of Nuclear Weapons (1968), IAEA Doc. INFCIRC/140, 729 UNTS 169, entered into force 5 March 1970 (NPT).
8. Comprehensive Nuclear-Test-Ban Treaty (1996) (not yet entered into force), available at: www.ctbto.org/fileadmin/content/treaty/treaty_text.pdf (Nuclear Test Ban Treaty).
9. Agreement between the United Arab Emirates and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-proliferation of Nuclear Weapons, IAEA Doc. INFCIRC/662, entered into force 9 Oct. 2003.
10. Convention on the Physical Protection of Nuclear Material, (1980), IAEA Doc. INFCIRC/274 Rev. 1, 1456 UNTS 125, entered into force 8 February 1987 (CPPNM).
11. United Nations Security Council Resolution 1540 (2004), "Non-proliferation of weapons of mass destruction", UN Doc. S/RES/1540, adopted 28 April 2004.
12. International Convention for the Suppression of Acts of Nuclear Terrorism (2005), 2445 UNTS 137, entered into force 7 July 2007 (Nuclear Terrorism Convention).

- Protocol Additional to the Comprehensive Safeguards Agreement between the UAE and the IAEA (signed, 8 April 2009);[13]
- Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (acceded, 31 July 2009);[14]
- Convention on Nuclear Safety (acceded, 31 July 2009);[15]
- Amendment to the Convention on the Physical Protection of Nuclear Material (accepted, 31 July 2009);[16]
- Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (acceded, 29 May 2012);[17]
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention (acceded, 29 August 2012);[18] and
- Convention on Supplementary Compensation for Nuclear Damage (ratified, 7 July 2014).[19]

A. Security, non-proliferation and trade

To enhance confidence and to support the non-proliferation efforts of the international community, the UAE adopted and enforces all major international non-proliferation instruments and is prepared to undertake further obligations to underpin the establishment of its peaceful and transparent nuclear energy programme.

The political commitment of the UAE to the peaceful use of nuclear power was made in 1995 upon its accession to the NPT as well as its ratification of the IAEA Comprehensive Safeguards Agreement in 2003. The UAE signed the Additional Protocol to its Comprehensive Safeguards Agreement in 2009, which establishes a procedure for stringent inspections and further demonstrates the UAE commitments to the highest standards of non-proliferation. The Additional Protocol was brought into force in 2010. The UAE views the application of a Comprehensive Safeguards Agreement, strengthened by the IAEA Additional Protocol, as an important component of its model for adopting a peaceful nuclear energy programme and it

13. Protocol Additional to the Agreement between the United Arab Emirates and the International Atomic Energy Agency for the Application of Safeguards in Connection with the Treaty on the Non-Proliferation of Nuclear Weapons, IAEA Doc. INFCIRC/662/Add.1, entered into force 20 Dec. 2010.
14. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).
15. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 October 1996 (CNS).
16. Amendment to the Convention on the Physical Protection of Nuclear Material (2005), IAEA Doc. INFCIRC/274/Rev.1/Mod.1, entered into force 8 May 2016 (ACPPNM).
17. Protocol to Amend the 1963 Vienna Convention on Civil Liability for Nuclear Damage (1997), IAEA Doc. INFCIRC/566, 2241 UNTS 302, entered into force 4 October 2003 (1997 Vienna Convention); Federal Decree No. 32 of 2012 Ratifying the Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage of 1997.
18. Joint Protocol Relating to the Application of the Vienna Convention on Civil Liability for Nuclear Damage and the Paris Convention on Third Party Liability in the Field of Nuclear Damage (1988), IAEA Doc. INFCIRC/402, 1672 UNTS 293, entered into force 27 April 1992 (Joint Protocol); Federal Decree No. 33 of 2012 Ratifying the Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention of 1988.
19. Convention on Supplementary Compensation for Nuclear Damage (1997), IAEA Doc. INFCIRC/567, 36 ILM 1473, entered into force 15 April 2015 (CSC); Federal Decree No. 51 of 2014 Ratifying the Convention on Supplementary Compensation for Nuclear Damage.

considers that these instruments are consistent with its commitment to complete operational transparency and to the highest standards of non-proliferation.

With regard to control of trade, the UAE continues to strengthen its export control regime to block and respond effectively to illicit trade of nuclear material or equipment. To this end, the UAE implements commitments under the NPT, the CPPNM and the Joint Convention. As a means of ensuring the establishment and maintenance of the most comprehensive and up-to-date export control regime, the UAE implements import and export control rules for nuclear and nuclear-related equipment and technology in line with the Nuclear Suppliers Group (NSG)[20] Guidelines.[21] In connection with the broader need to regulate trade, the UAE established, under Federal Law No. 13 of 2007, a legal regime for commodities that are subject to import and export control procedures. Included within the scope of Federal Law No. 13 is a list of export-controlled technologies addressing nuclear materials, technologies and equipment.

B. Nuclear safety

In tandem with a commitment to reinforce non-proliferation obligations, the UAE undertakes all recommended international obligations for ensuring safety of nuclear activities. The UAE joined the Assistance and Notification Conventions in 1987 as a consequence of the Chernobyl accident and joined both the CNS and the Joint Convention in 2009.

With regard to the safety of facilities and as required by the CNS, the UAE implements a comprehensive regime that maintains a high level of safety according to international standards and ensures that all nuclear-related installations are operated in a safe, well-regulated and environmentally sound manner. With regard to the safety of radioactive waste and as required by the Joint Convention, the UAE will maintain a high level of safety in the management of spent fuel and radioactive waste. In such a scenario, appropriate measures will be established to ensure protection against radiological hazards at all stages of spent fuel and radioactive waste management, and emergency plans will be implemented at waste management and spent fuel facilities.

Nuclear liability

The UAE recognises that dealing with eventual nuclear liability claims under existing national compensation laws is greatly limited by the unique character of the risks posed by radioactive material. Consequently, as a critical element underpinning the establishment of a peaceful nuclear energy programme, the UAE joined two international instruments in this area in 2012, specifically, the 1997 Vienna Convention and the Joint Protocol. That same year, the UAE issued Federal Law by Decree No. 4 of 2012 Concerning Civil Liability for Nuclear Damage,[22] which aims to regulate the provisions and determine the scope of civil liability and compensation for nuclear damage that could occur as a result of a nuclear incident.

20. The NSG "is a group of nuclear supplier countries that seeks to contribute to the non-proliferation of nuclear weapons through the implementation of two sets of Guidelines for nuclear exports and nuclear-related exports." NSG (n.d.), "About the NSG", www.nuclearsuppliersgroup.org/en /about-us (accessed 2 May 2018).
21. IAEA (2016), "Guidelines for Nuclear Transfers", IAEA Doc. INFCIRC/254/Rev.13/Part1; IAEA (2018), "Guidelines for Transfers of Nuclear-Related Dual-Use Equipment, Materials, Software, and Related Technology", IAEA Doc. INFCIRC/254/Rev.10/Part 2a (corrected).
22. Federal Law by Decree No. 4 of 2012 Concerning Civil Liability for Nuclear Damage (Nuclear Liability Law). An unofficial English translation of the Nuclear Law is available at: www.fanr.gov.ae/en/Lists/LawOfNuclear/Attachments/3/Federal-Law-by-Decree-No-4-of-2012-Concerning-Civil-Liability-for-Nuclear-Damage-English.pdf.

Two years later, the UAE joined the CSC, an international treaty developed as an umbrella for international liability conventions, providing the basis for a global nuclear liability regime.

The provisions of the Nuclear Liability Law are in line with the 1997 Vienna Convention and best international practices, providing for:

1. the legal and exclusive channelling of the liability for nuclear damage onto the operator of the NPP where the incident occurred (i.e. the exclusive liability of the operator);
2. the possibility of establishing the operator's liability without having the person suffering the damage prove negligence or any type of fault on the part of the operator (i.e. strict liability of the operator). Under the Nuclear Liability Law, the strict liability of the operator begins upon the arrival of fuel assemblies on site;[23]
3. the unity of jurisdiction, i.e. the Federal Courts in Abu Dhabi will have sole jurisdiction for actions that may be brought in accordance with the Nuclear Liability Law;
4. the limitation of the liability amount, which is set under the Nuclear Liability Law not to exceed 450 million Special Drawing Rights (SDR);[24]
5. the obligation of the operator to maintain insurance and guarantees required by FANR with respect to its liability for nuclear damage, i.e. up to SDR 450 million or any other amount determined by FANR. This insurance or other financial security shall be of such type and on such terms as approved by FANR;
6. the limitation in time of any actions for compensation under the Nuclear Liability Law, which may only be brought against the operator or the person providing financial security within 3 years from the date the person suffering damage had knowledge or ought reasonably to have had knowledge of the damage and of the operator liable, provided that such action is brought with respect to loss of life and personal injury within 30 years from the date of the nuclear incident, or with respect to other damage within 10 years from the date of the nuclear incident; and
7. the compensation of nuclear damage without discrimination on the basis of nationality, domicile or residence.

In accordance with the Nuclear Liability Law, FANR is deemed to be the competent authority for the implementation of the Law and may issue rules and regulations relating to the application of the provisions of the law.

For purposes of the Nuclear Liability Law, the term "nuclear damage" is consistent with the definition given by the 1997 Vienna Convention and includes death or personal injury, loss of or damage to property, economic loss, cost of restoring the impaired environment or loss of income from an economic interest as

23. The scope and limit of liability for fuel assembly transit is provided under the Nuclear Liability Law.
24. The SDR is a reserve asset defined and maintained by the International Monetary Fund (IMF). The value of the SDR is defined by a weighted currency basket of five major currencies: the US dollar, the euro, the British pound sterling, the Chinese renminbi and the Japanese yen. For more detailed discussion on the SDR, see IMF (2018), "Special Drawing Rights (SDR)", www.imf.org/en/About/Factsheets/Sheets/2016/08/01/14/51/Special-Drawing-Right-SDR. As of 2 May 2018, SDR 1 equals approximately USD 1.43. For the current SDR value, see IMF, "SDR Valuation", www.imf.org/external/np/fin/data/rms_sdrv.aspx.

a result of such impairment, preventive measures arising from further loss or damages of the said measures, and any other economic loss as a result of a nuclear accident. The Nuclear Liability Law sets standards to provide financial protection against nuclear damage resulting from nuclear incidents. If the operator is not able, after exhausting all efforts, to obtain full insurance coverage, FANR may determine that the required insurance is not available in domestic or international insurance markets, or that the insurance coverage is not available or is temporarily suspended, in which case the non-insurable risks will be covered directly by the UAE up to SDR 450 million until such time as FANR announces the availability of the insurance coverage and gives the relevant parties a period of time to obtain such insurance. The provisions of the law will not impede the rights or obligations of any person to obtain compensation under any health insurance scheme, employees' compensation or other occupational disease compensation scheme.

Conclusion

ENEC is proud to lead the development of the UAE Peaceful Nuclear Energy Program and deliver the country's first nuclear power plant. With this first peaceful, civilian nuclear energy programme, the UAE serves as an example for countries around the world embarking on or considering the development of nuclear energy.

The UAE's approach to peaceful nuclear energy was thoughtful and deliberate. The country's leadership insisted on looking beyond obvious energy solutions in the planning stage, such as long-term reliance on the nation's oil wealth. UAE decision makers also engaged and involved the best experts in energy development issues around the world and opted to develop civilian nuclear energy only after careful and extended study. As the Barakah site prepares to become a combined construction and operating site in 2018, the UAE contributes to the global nuclear energy industry with lessons learnt from the construction project and it will continue to do so as the nuclear power plant enters commercial operation.

Case law

Germany

Judgement of the Federal Constitutional Court of 6 December 2016[1]

The German legislator decided in 2002 to phase-out the use of nuclear energy for electricity generating purposes.[2] The 2002 Act allocated a residual electricity volume to the individual nuclear power plants, which could be transferred to other plants. However, after the volume was used up, the respective plant has to be shut down. There was no fixed end of operation; the end was fixed by the consumption of the allocated electricity volume. The 11th Amendment to the Atomic Energy Act of 8 December 2010[3] extended the operation periods to an average period of 12 years by increasing the permitted electricity volumes.

After the 2011 Fukushima nuclear accident, the 13th Act of 31 July 2011 to Amend the Atomic Energy Act[4] revoked the 2010 prolongation of the operational lifetimes and fixed dates by which the operation of nuclear power plants has to come to an end. While the 11th Amendment to the Atomic Energy Act accepted nuclear energy as a "bridge technology", which warrants a limited prolongation of the operation time, the 13th Amendment clearly aimed at an acceleration of the phasing-out. The last nuclear power plant shall be shut down on 31 December 2022.[5]

Nuclear energy subsidiaries of three of Germany's four largest energy suppliers and one company operating a nuclear power plant directed constitutional complaints [*Verfassungsbeschwerde*] against the 13th Amendment to the Atomic Energy Act. They did not challenge the fundamental decision taken in the 2002 Act to end the peaceful uses of nuclear energy in Germany. The constitutional review rather is based on a legal situation where the end of the nuclear power plants' power production, given their allocated volumes of electricity, was already set down. The complainants mainly challenge a violation of the freedom of property as guaranteed in Article 14, paragraph 1 of the *Grundgesetz* (GG) [Basic Law, i.e. Constitution].

1. *Bundesverfassungsgericht* [Federal Constitutional Court], *Leitsätze zum Urteil des Ersten Senats vom 6. Dezember 2016* [Headnotes to the Judgment of the First Senate of 6 December 2016] 1 BvR 2821/11, 1 BvR 321/12, 1 BvR 1456/12. Available (in German) at: www.bverfg.de/e/rs20161206_1bvr282111.html. An English translation of the judgement is available at: www.bundesverfassungsgericht.de/SharedDocs/Entscheidungen/EN/2016/12/rs20161206_1bvr282111en.html;jsessionid=049968F26A8BE0377B7BE65C49ECA728.1_cid392.
2. Act on the Controlled Phasing Out of the Use of Nuclear Power for the Commercial Generation of Energy of 22 April 2002, *Bundesgesetzblatt* [Federal Law Gazette] (BGBl.) 2002 I, p. 1351 (2002 Act); see NEA (2002), "National Legislative and Regulatory Activities: Germany – Act on the Phase-out of Nuclear Power (2002)", *Nuclear Law Bulletin*, No. 69, OECD, Paris, pp. 76-77 and Vorwerk, A. (2002), "The 2002 Amendment to the German Atomic Energy Act Concerning the Phase-out of Nuclear Power", *ibid.* pp. 7-14. The Atomic Energy Act in its consolidated 2002 version is reproduced in the Supplement to NEA (2002), *Nuclear Law Bulletin*, No. 70, OECD, Paris.
3. BGBl. 2010 I, p. 1814; see NEA (2010), "National legislative and regulatory activities: Germany – Amendment to the Atomic Energy Act extending the operating lifetime of nuclear power plants (2010)", *Nuclear Law Bulletin*, No. 86, OECD, Paris, pp. 76-77.
4. BGBl. 2011 I, p. 1704; see NEA (2011), "National legislative and regulatory activities: Germany – Legislative package on the change of energy policy; 13th Amendment to the Atomic Energy Act (2011)", *Nuclear Law Bulletin*, No. 88, OECD, Paris, pp. 78-79.
5. Atomic Energy Act as amended by the 13th Act to Amend the Atomic Energy Act, *supra* note 4, Sect. 7, para. 1a.

The Court ruled in its 6 December 2016 judgement that the 13th Amendment to the Atomic Energy Act impairs the property of the complainants in several regards. This is summed up in the Headlines [*Leitsätzen*] of the judgement as follows:[6]

1. The Thirteenth Act Amending the Atomic Energy Act (*Dreizehntes Gesetz zur Änderung des Atomgesetzes* – 13th AtG Amendment) which aims to realise the acceleration of the nuclear phase-out is for the most part compatible with the Basic Law.

2. A legal person governed by private law, which is operated domestically for profit and entirely owned by a Member State of the European Union, can, by reason of the Basic Law's openness toward European law, as an exception, invoke freedom of property and file a constitutional complaint.

3. a) The electricity volumes allocated by law to the nuclear power plants in 2002 and 2010 do not constitute, in and of themselves, stand-alone property rights enjoying protection of property; given that they are significant parameters for the use of the power plants, the electricity volumes do, however, benefit from protection of ownership of the power plants.

   b) A licence granted under public law does not generally constitute property.

4. An expropriation under Article 14 sec. 3 of the Basic Law (*Grundgesetz* – GG) presupposes the deprivation of property through a change in the assignment of ownership and always also presupposes a process for the acquisition of goods. Accordingly, the provisions of the Thirteenth Act Amending the Atomic Energy Act of 31 July 2011 that are set out to accelerate the nuclear phase-out do not amount to an expropriation of property.

5. Insofar as restrictions of the power of use and disposition over property qualifying as determinations of content and limits within the meaning of Art. 14 sec. 1 sentence 2 GG lead to a deprivation of specific property interests without contributing to the acquisition of goods, enhanced requirements must be applied with regard to their proportionality. They then also always raise the question of a settlement provision.

6. The revocation, without compensation, of the prolongation of the operational lifetimes of the nuclear power plants by an average of twelve years that had been set down statutorily at the end of 2010, brought about by the challenged Thirteenth Act Amending the Atomic Energy Act is constitutional, given the repeated limiting of expectations with regard to preserving the additional electricity output allowances. The legislature was also entitled to use the reactor accident in Fukushima, even without any new findings as to dangers, as an opportunity to accelerate the nuclear phase-out for the protection of the health of the people and the environment.

7. Due to the statutorily fixed operational lifetimes of the power plants and due to the specifically established protection of legitimate expectations in this case, the Thirteenth Act Amending the Atomic Energy Act contains a determination of the contents and limits of property that is unreasonable insofar as it hinders two of the complainants from using up substantial parts of the residual electricity volumes of 2002 within their corporations.

8. Under certain conditions, Article 14 sec. 1 of the Basic Law protects legitimate expectation in the stability of a legal situation as a basis for investments in property and its use.

6. Headnotes to the Judgment of the First Senate of 6 December 2016, *supra* note 1.

The operative part of the judgement reads:[7]

1. Article 1 no. 1 letter a (§ 7 sec. 1a sentence 1 Atomic Energy Act, *Atomgesetz* – AtG) of the Thirteenth Act Amending the Atomic Energy Act (*Dreizehntes Gesetz zur Änderung des Atomgesetzes – 13. AtG-Novelle* – 13th AtG Amendment) of 31 July 2011 (Federal Law Gazette, *Bundesgesetzblatt – BGBl* 2011 page 1704) is incompatible, as stated in the reasons of this judgement, with Article 14 sec. 1 of the Basic Law (*Grundgesetz* – GG), insofar as the Act does not ensure that the [] volumes of electricity allocated to the nuclear power plants under Appendix 3 column 2 of the Atomic Energy Act can be used up completely or almost completely, and does not provide for appropriate settlement.
2. The Thirteenth Act Amending the Atomic Energy Act is incompatible with Art. 14 sec. 1 GG insofar as it does not include any provision for a settlement for investments that were made in legitimate expectation of the additional electricity output allowances allocated in 2010, but were devalued by the Amendment.
3. For the rest, the constitutional complaints are rejected.
4. The legislature must adopt new provisions no later than 30 June 2018. § 7 sec. 1a sentence 1 AtG is to remain applicable until the adoption of a new provision.
5. The Federal Republic of Germany is to reimburse each of the complainants in proceedings 1 BvR 321/12 and 1456/12 for one-third, and the complainant in proceeding 1 BvR 2821/11 for one-fourth, of the necessary expenses they have incurred in their constitutional complaint proceedings.

The adoption of new provisions, demanded under No. 4 of the judgement, is under preparation currently.

Japan

District court decisions on lawsuits related to state liability following the Fukushima Daiichi nuclear power plant accident

Various lawsuits have been filed in Japan following the Fukushima Daiichi nuclear power plant (NPP) accident. One of the claims being pursued in these lawsuits is the liability of the state due to the Japanese government's failure to exercise its regulatory authority.

Fukushima residents and evacuees have filed lawsuits against the government seeking compensation for damages arising from the accident, like mental anguish. They have claimed that the government should be held liable because it failed to exercise its regulatory authority against the Tokyo Electric Power Company (TEPCO), the operator of Fukushima Daiichi NPP. Lawsuits have also been filed against TEPCO.

As of December 2017, three decisions related to state liability have been rendered by district courts, but these courts reached different conclusions. The Maebashi District Court and the Fukushima District Court found liability on the part of the government and TEPCO and ordered them to pay compensation to the Fukushima Daiichi NPP accident victims. These decisions were based on Article 1 of the State Redress Act (for the government) and Article 3 of the Act on Compensation for

7. *Ibid.*

Nuclear Damage (for TEPCO).[8] Meanwhile, the Chiba District Court found liability on the part of TEPCO but rejected the claim against the government. These three decisions have been appealed to the high court.

In reaching these decisions, district courts mainly analysed the following questions:

- whether the government could have foreseen a large tsunami;
- whether the government could have prevented the accident by the exercise of its regulatory authority; and
- whether the fact that the regulatory authority did not take enough preventive measures against tsunamis was irrational.

Maebashi District Court decision finding state liability

In May 2017, the Maebashi District Court ordered the government and TEPCO to jointly pay damages for mental anguish. The Court found that the government had been able to foresee a large tsunami beyond the site level of the Fukushima Daiichi NPP with the possibility of flooding emergency electricity equipment based on the latest information it had at that time, such as the evaluation on long-term probability of earthquake occurrence. Furthermore, the Court found that if the government had issued a technical order for preventing tsunamis to TEPCO, TEPCO would have taken some preventive measures against tsunamis and the accident would have been avoided.

The Court stated that the government is strongly expected to prevent any nuclear accident. The Court further stated that the government knew the Fukushima Daiichi NPP's weakness against tsunamis and that TEPCO would not, on its own, take enough preventive measures against tsunamis. Therefore, the government should have exercised its regulatory authority over TEPCO, ordering it to take preventive measures against tsunamis. Based on these premises, the Court found that the government's failure to exercise its regulatory authority was irrational and illegal.

The government claimed that TEPCO, as a nuclear operator, bears the primary responsibility for the safety of its NPPs and the government's responsibility is limited in comparison. But, the Court instead found that the government's responsibility is equal to TEPCO's because its failure to exercise regulatory authority was irrational and illegal. The Court therefore found that the government and TEPCO should pay equal compensation.

Chiba District Court decision rejecting the claims against the government

In September 2017, the Chiba District Court ordered TEPCO to pay damages for mental anguish, but rejected the claim against the government. The Court found that although the government had been able to foresee a large tsunami beyond the site level of the NPP, it prioritised taking preventive measures against earthquakes rather than tsunamis based on the knowledge it had at that time. Further, the Court pointed out that it is possible the accident could not have been avoided even though TEPCO took some preventive measures against tsunamis. Therefore, the Court found that the regulatory authority's inaction was not irrational and thus not illegal.

8. In a discussion at the National Diet in 2012, the Japanese Government interpreted the State Redress Act as not excluding the possibility of state liability in the case of negligence, even though the liability for nuclear damage is channelled to the nuclear operator based on the Act on Compensation for Nuclear Damage. None of the three district court decisions addressed the relationship between the two Acts and the allocation of liability thereunder.

Fukushima District Court decision finding state liability

In October 2017, the Fukushima District Court ordered the government and TEPCO to jointly pay damages for mental anguish. The Court found that the government had been able to foresee a large tsunami beyond the site level of the NPP based on the latest information it had at that time. The Court also found that the accident could have been avoided if the government had properly exercised its regulatory authority and ordered TEPCO to take preventive measures against tsunamis.

The Court stated that the government has a strong duty to protect residents who were directly affected and seriously damaged by nuclear accidents through its exercise of authority. Based on this premise, the Court found that the regulatory authority's failure to take enough preventive measures against tsunamis was irrational and illegal.

In addition, the Court stated that nuclear operators are primarily responsible for the safety of NPPs and the responsibility of the government is to oversee nuclear operators; therefore, the liability amount of the government should be limited to one half of TEPCO's, the nuclear operator.

United States

Natural Resources Defense Council v. NRC (DC Cir. 2018)

On 19 January 2018, the United States (US) Court of Appeals for the District of Columbia Circuit (DC Circuit) denied challenges by two non-profit organisations (Plaintiffs) to the US Nuclear Regulatory Commission's (NRC) issuance of a licence to Strata Energy, Inc. (Strata) for an in-situ uranium mining facility in Wyoming.[9] The Plaintiffs argued that due to various deficiencies in the NRC staff's final Environmental Impact Statement (FEIS), the NRC failed to adequately fulfil its obligations under the National Environmental Policy Act.[10] NEPA has "twin aims" in that it ensures that a federal agency considers "every significant aspect of the environmental impact of a proposed action," and "inform[s] the public that it has indeed considered environmental concerns in its decisionmaking process."[11] To achieve these aims, NEPA directs federal agencies to prepare an FEIS for all "major Federal actions significantly affecting the quality of the human environment."[12]

Prior to the federal litigation, the NRC Atomic Safety and Licensing Board (the Board) heard Plaintiffs' challenges to the NRC staff's FEIS. While the Plaintiffs' case before the Board was pending, the NRC issued the licence to Strata in April 2014 because NRC regulations permit the NRC staff to issue certain licences before the culmination of adjudicatory proceedings.[13] Thereafter, in January 2015, the Board issued its final decision rejecting Plaintiffs' various challenges to the adequacy of the NRC staff's FEIS and finding no fault with the agency's decision to issue the licence.[14] Notably, although the Board found NRC staff's FEIS did not contain sufficient information concerning post-mining aquifer restoration at other in-situ mining sites, the Board nonetheless determined that the NRC staff's testimony in the evidentiary hearing cured this deficiency by supplementing the FEIS.[15]

9. Natural Resources Defense Council v. NRC, No. 16-1298, 2018 WL 472547 (DC Cir. 2018).
10. National Environmental Policy Act of 1969, 42 USC 4321 et seq. (NEPA).
11. Baltimore Gas & Electric Co. v. Natural Resources Defense Council, 462 US 87, 97 (1983).
12. 42 USC § 4332(2)(C).
13. 10 CFR § 2.1202. CFR refers to the Code of Federal Regulations, the official compilation of regulations issued by federal governmental agencies in the US. The NRC's regulations are published in Title 10 of the CFR, ranging from Parts 1 through 199.
14. Strata Energy, Inc. (Ross In Situ Recovery Uranium Project), LBP-15-3, 81 NRC 65 (2015).
15. *Ibid.*, p. 122, n. 49.

On appeal to the Commission, Plaintiffs argued that it was impermissible under NEPA for the Board decision to "supplement" the FEIS after the NRC staff had issued the licence to Strata. The Commission rejected Plaintiffs' argument, explaining that under NRC precedent "a Board's hearing, hearing record, and subsequent decision on a contested environmental matter augment the environmental record of decision developed by the Staff with respect to this issue."[16] Commissioner Baran, however, dissented, concluding that because a "core requirement of NEPA" is "that the decisionmaker consider all environmental impacts of an action *before* making a decision", the NRC staff who issued the licence (rather than the Board or Commission through the adjudicatory process) must make a new, fully-informed decision on whether to reaffirm or modify the licence based on the new information provided at the hearing.[17]

On appeal to the DC Circuit, Plaintiffs renewed their various challenges to the NRC staff's FEIS, including their claim that the Board's decision could not supplement the NRC staff's environmental analysis after the agency had already issued the licence to Strata.[18] The DC Circuit, however, rejected Plaintiffs' argument, stating that "the Board came to the same decision after it had considered the supplemental information, and there is nothing to be gained by remanding the matter to the Commission for the staff or the Board to consider the same information again."[19] Although the Court acknowledged that the NRC's process was not "ideal or even desirable", it nevertheless concluded that "common sense counsels against prolonging this dispute by requiring an utterly pointless proceeding on remand."[20]

Virginia Uranium, Inc. v. Warren, 848 F.3d 590 (4th Cir. 2017)

On 21 April 2017, a collection of uranium mining companies and owners of land containing uranium deposits (Petitioners) submitted a petition for a *writ of certiorari*[21] to the US Supreme Court seeking review of a US Court of Appeals for the Fourth Circuit decision upholding the dismissal of Petitioners' challenge to the Commonwealth of Virginia's ban on conventional uranium mining. By way of background, Petitioners contend that Virginia's conventional uranium mining ban is preempted by federal law under the Supremacy Clause of the US Constitution.[22] Specifically, Petitioners argue that Virginia's moratorium on conventional uranium mining was motivated by concerns for radiological safety relating to uranium ore milling and tailings storage. Therefore, according to Petitioners, Virginia's mining

16. Strata Energy, Inc. (Ross In Situ Recovery Uranium Project), CLI-16-13, 83 NRC 566, 595 (2016) (citing Entergy Nuclear Operations, Inc. (Indian Point, Units 2 and 3), CLI-15-6, 81 NRC 340, 388 (2015)).
17. *Ibid.*, p. 604 (emphasis in original).
18. Natural Resources Defense Council v. NRC, No. 16-1298, *supra* note 8, slip op. at 12.
19. *Ibid.*, p. 13.
20. *Ibid.*, pp. 15-16.
21. A *writ of certiorari* is the primary means by which parties can petition the US Supreme Court to review a lower court decision. According Rule 10, "Considerations Governing Review on Writ of Certiorari", of the Rules of the Supreme Court of the United States, "[r]eview on a writ of certiorari is not a matter of right, but of judicial discretion. A petition for a writ of certiorari will be granted only for compelling reasons."
22. The Supremacy Clause of the US Constitution is a conflict-of-laws type of provision with a long-standing history in American jurisprudence. Under the Supremacy Clause, if there is a clash between federal and state law, then federal law prevails and the state law is invalid. There are several types of pre-emption under the Supremacy Clause: express pre-emption, where Congress specifically states that a federal law pre-empts state law; field pre-emption, where federal laws are so pervasive in a field or area that states cannot create laws in that same field or area; and conflict pre-emption, where it would be impossible to comply with both state law and federal law or the state law places an obstacle in achieving Congressional objectives.

ban is preempted by the Atomic Energy Act,[23] which gives the Nuclear Regulatory Commission (NRC) exclusive regulatory authority over radiological safety hazards. The US District Court for the Western District of Virginia rejected this argument and granted Virginia's motion to dismiss the case, finding that Virginia's moratorium was not preempted by federal law because the NRC does not regulate conventional uranium mining.[24] On appeal, a divided Court of Appeals affirmed the District Court's ruling, concluding that the radiological safety motivations underlying Virginia's moratorium were irrelevant to the Court's review because the activity that is the specific subject of the ban – conventional uranium mining – is not within the NRC's exclusive authority under the Atomic Energy Act.[25] The Court reached this conclusion notwithstanding Petitioners' assertion that the ban was motivated by radiological safety concerns associated with downstream activities that the NRC does regulate: milling and tailings storage.

In their petition for review to the Supreme Court, Petitioners argue, *inter alia*, that the District Court and the Court of Appeals opinions failed to apply established Supreme Court precedent that, Petitioners contend, mandates an inquiry into the legislative motives of the challenged state law.[26] Petitioners also argue that the Court of Appeals opinion improperly departs from other Appeals Court decisions, which held that challenged state laws were preempted by the AEA because the state laws were motivated at least in part by concerns for radiological safety associated with NRC-regulated activities, even though the laws, on their face, regulate activities that fell within the states' traditional authority.[27]

23. The Atomic Energy Act (AEA) is the fundamental US law on both the civilian and the military uses of nuclear materials. The Act requires that civilian uses of nuclear materials and facilities be licensed, and it empowers the NRC to establish by rule or order, and to enforce, such standards to govern these uses as "the Commission may deem necessary or desirable in order to protect health and safety and minimize danger to life or property." The Act is codified at 42 United States Code (USC) §§ 2011-2021, 2022-2286i, 2296a-2297h-13 (1954). Because the AEA provides the NRC authority to regulate the civilian use of nuclear materials and facilities in order to protect public health and safety, laws motivated by radiological safety concerns associated with NRC-regulated activities are solely within the province of the federal government through field pre-emption under the Supremacy Clause. Pacific Gas & Elec. Co. v. State Energy Resources Conservation & Dev. Comm'n, 461 US 190 (1983). However, under the Agreement State Program, states may voluntarily enter agreements with the NRC in which the NRC discontinues portions of certain components of its regulatory authority and allows the state to act in its stead so long as the state meets certain requirements.
24. Virginia Uranium, Inc. v. McAuliffe, 147 F. Supp. 3d 462, 477-478 (W.D. Va. 2015). Although conventional mining is not regulated by the NRC, in situ recovery, the technique largely employed in the Western US, but not Virginia, falls under NRC authority. See generally 10 CFR Part 40.
25. Virginia Uranium, Inc. v. Warren, 848 F.3d 590, 593 (4th Cir. 2017). Judge Traxler dissented, stating that "established Supreme Court law makes clear that the AEA preempts state statutes enacted for the purpose of protecting against the radiological dangers of activities the AEA regulates." *Ibid*., p. 614 (Traxler, J. dissenting).
26. Petition for Writ of Certiorari, pp. 2-6 (citing Pacific Gas & Elec. Co, *supra* note 23, p. 212). The Petition is available at www.scotusblog.com/wp-content/uploads/2017/05/16-1275-cert-petition.pdf.
27. Petition for Writ of Certiorari, pp. 25-33 (citing Nuclear Vermont Yankee, LLC v. Shumlin, 733 F.3d 393, 422 (2nd Cir. 2013) and Skull Valley Band of Goshute Indians v. Nielson, 376 F.3d 1223, 1251–52 (10th Cir. 2004)).

US Senators Tom Cotton, Jim Inhofe and Ted Cruz filed an amicus brief with the Court in favour of Petitioners.[28] Citing the importance of domestically produced uranium to national security, the Senators argued that the Fourth Circuit opinion "upends the [AEA] jurisdictional balance without considering the national and international consequences that flow from the military, political, and economic interests at stake."[29]

28. Brief of Senator Tom Cotton, et al. as Amici Curiae Supporting Petitioners, Virginia Uranium Inc. v. Warren (No. 16-1275). The Senators' amicus brief is available at www.scotusblog.com/wp-content/uploads/2017/06/16-1275-ac-tom-cotton.pdf. An amicus brief "brings to the attention of the Court relevant matter not already brought to its attention by the parties." Rules of the Supreme Court of the United States, Rule 37.1, "Brief for an Amicus Curiae".
29. Brief of Senator Tom Cotton, et al., *supra* note 28, p. 4.

National legislative and regulatory activities

France

Nuclear installations

Decree No 2017-508 of 8 April 2017 revoking the licence to operate Fessenheim Nuclear Power Plant[1]

Pursuant to Article L. 311-5-5 of the Energy Code,

> a licence to operate a nuclear power plant [(NPP)] may not be granted when granting it would result in an increase of the authorised total nuclear electricity generation capacity beyond 63.2 gigawatts [(GW)]. In assessing the total capacity, the administrative authority takes into account the revocations declared by decree upon request of a licensee…

The decree of 8 April 2017 revokes the license to operate Fessenheim NPP (Bas-Rhin, France) held by Électricité de France (EDF). In order to observe the 63.2 GW limit, this revocation shall enter into force once the Flamanville 3 EPR nuclear reactor at the Flamanville NPP (Manche, France) is commissioned. Commissioning of Flamanville 3 is expected to take place by 11 April 2020 at the latest.

Lithuania

General legislation, regulations and instruments

Amendments to the Law on Nuclear Energy[2]

The main objectives of the Amendment of the Law on Nuclear Energy are to:

- establish provisions regarding on-site physical security for nuclear facilities and improve the regulation of physical protection of nuclear material and nuclear facilities based on recent regulatory experience;
- improve regulation of the vetting procedure required for unescorted access to nuclear facilities, including the extended list of grounds for refusal of such right; and
- establish requirements for the certification of executive employees of nuclear facilities in order to ensure the adequacy of their competence and assign the State Nuclear Power Safety Inspectorate (VATESI) with the responsibility to issue such certificates.

1. *Journal officiel "Lois et Décrets"* [Official Journal of Laws and Decrees] (J.O.L. et D.), 9 April 2017, text no. 34.
2. Law of the Republic of Lithuania Amending Articles 2, 7, 15, 16, 19, 20, 22, 23, 24, 25, 29, 30, 33, 34, 35, 36, 50 of the Law on Nuclear Energy No. I-1613 and Supplementing Article 501, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/8c086ae02f3a11e78397ae072f58c508.

Amendments to the Law on Nuclear Safety[3]

The main objectives of the Amendment of the Law on Nuclear Safety are to:

- streamline the system of enforcement measures for activities in the area of nuclear energy. In particular, the objective is to define cases when certain mandatory requirements (e.g. to eliminate violations or to cease activities) are issued by the regulatory body more clearly; to heighten the most relevant procedural requirements for issuing decisions on enforcement measures up to the level of law; to introduce a formal clause empowering inspectors to take immediate, on-the-spot enforcement actions in case of serious violations, etc. Following the aforementioned amendments, a new version of the Rules of Procedure for Applying the Enforcement Measures[4] was issued by the Head of VATESI in order to detail procedural requirements, e.g. forms for regulatory decisions.

- establish types of certificates for transport of nuclear fuel cycle, nuclear and fissionable materials issued by VATESI as required by international conventions and other instruments regulating transport of Class 7 material, as well as the procedure for issuing, suspending and revoking them. Following amendments to the Law on Nuclear Safety, Nuclear Safety Requirements BSR-4.1.1-2017 "Rules on the Issue of Certificates for Transport of Nuclear Fuel Cycle, Nuclear and Fissionable Materials"[5] were adopted by the Head of VATESI in order to set requirements for applications for the certificates and the form of the certificates.

- improve of procedures for licensing activities in the area of nuclear energy.

Transposition of Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations[6]

In 2017, several legal acts were adopted in order to transpose the provisions of the 2014 Amended Safety Directive into Lithuanian law. The amendments to the Law on Nuclear Energy[7] and the Law on Nuclear Safety[8] set or detail the following provisions:

3. Law of the Republic of Lithuania Amending Articles 4, 5, 6, 10, 12, 16, 23, 25, 26, 27, 28, 29, 31, 47, 48, Title of Chapter Five of the Law on Nuclear Safety No. XI-1539, and Supplementing Articles 221, 241 and 261, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/013ed3802f3b11e78397ae072f58c508.
4. Order No. 22.3-115 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 22.3-106, 24 October 2011, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.1.4-2016 "Rules of Procedure for Applying the Enforcement Measures Set by the State Nuclear Power Safety Inspectorate", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/3811954060ab11e79198ffdb108a3753.
5. Order No. 22.3-133 (2017) of the Head of State Nuclear Power Safety Inspectorate on the approval of Nuclear Safety Requirements BSR-4.1.1-2017 "Rules on the Issue of Certificates for Transport of Nuclear Fuel Cycle, Nuclear and Fissionable Materials", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/d737fa2075e511e7827cd63159af616c.
6. Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, *Official Journal of the European Union* (OJ) L 219 (25 July 2014) (2014 Amended Safety Directive).
7. Law of the Republic of Lithuania Amending Articles 7, 15, 17, 21, 23, 24, 30, 39 and the Annex of the Law on Nuclear Energy No. I-1613 and Repealing Article 45, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/bb2702f0acdf11e78a4c904b1afa0332.
8. Law of the Republic of Lithuania Amending Articles 2, 3, 9, 11, 14, 17, 22, 25, 26, 27, 28, 30, 32, 35, 36, 38, 39, 41, 42, 50, the Title of Chapter Seven and Annex 2 of the Law on Nuclear Safety No. XI-1539, and Supplementing Articles 341 and 391, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/57a83860ace511e78a4c904b1afa0332.

- the nuclear safety objectives established by the 2014 Amended Safety Directive, which are mandatory for the design of new nuclear facilities and are set as an endeavour for nuclear facilities already under construction or in operation, were included into national law;
- the requirements for the periodic safety review (PSR) of nuclear facilities were improved and the procedural aspects of the regulatory review of the PSR report were established;
- extended regulation related to public communication and public participation in key decisions on nuclear power. Nuclear Safety Requirements BSR-1.1.5-2017 "Rules of Procedure for Public Participation in Decision-making in the Area of Nuclear Energy"[9] were adopted to further describe the procedural requirements of the public participation process, such as, the list of information to be provided in the announcements on key steps of procedure, procedural requirements for public hearings, etc.; and
- extended regulation of the organisation of international peer reviews.

Additionally, to transpose the 2014 Amended Safety Directive, the amendments to the Law on Nuclear Energy and the Law on Nuclear Safety as well as the amendment to the Law on Radiation Protection[10] supplemented the provisions on emergency preparedness in the case of a nuclear or radiological accident in order to prepare more effectively for possible accidents that could happen in the territory of the Lithuania or abroad. Additionally, the Law on Nuclear Safety supplemented the provisions on cases of unplanned regulatory inspections, as it is required by the Law on Public Administration of Lithuania to be laid down in law.

Additionally, the Head of VATESI adopted amendments to nuclear safety requirements:

- Amendment of Nuclear Safety Requirements BSR-2.1.2-2010 "General requirements on assurance of safety of nuclear power plants with RBMK-1500 type reactors"[11] introduced necessary corrections on terminology, operational limits and conditions as well as on provisions of operating, emergency operating and emergency preparedness procedures, applicable nuclear power plants with RBMK-1500 type reactors;
- Amendment of Nuclear Safety Requirements BSR-2.1.5-2015 "Commissioning of Nuclear Power Plant"[12] introduced requirements on operational limits and conditions, operating, emergency operating and emergency preparedness

9. Order No. 22.3-182 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.1.5-2017 "Rules of Procedure for Public Participation in Decision-making in the Area of Nuclear Energy", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/072e6200b7ea11e7afb78266242a6adf.
10. Law of the Republic of Lithuania Amending Article 71 of the Law on Radiation Protection No. VIII-1019, available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/218158b0ace611e78a4c904b1afa0332.
11. Order No. 22.3-142 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 2.3-16, 5 February 2010, approved by the Head of State Nuclear Power Safety Inspectorate On the approval of Nuclear Safety Requirements BSR-2.1.2-2010 "General Requirements on Assurance of Safety of Nuclear Power Plants with RBMK-1500 Type Reactors", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/d58899d0828511e7804fae56a3fa17a5.
12. Order No. 22.3-141 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 22.3-141, 16 July 2015, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-2.1.5-2015 "Commissioning of Nuclear Power Plant", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/223992c0828111e7804fae56a3fa17a5.

procedures, applicable for nuclear power plants with pressurised or boiling light water reactors and pressurised heavy water reactors.

Nuclear safety and radiological protection (including nuclear emergency planning)

Amended requirements for release of radionuclides

The Amendment to Nuclear Safety Requirements BSR-1.9.1-2011 "Standards of Release of Radionuclides from Nuclear Installations and Requirements for the Plan on Release of Radionuclides"[13] was adopted by the Head of VATESI in 2017. The main objective of the amendment was to transpose the Euratom Basic Safety Standards Directive.[14]

Nuclear installations

Nuclear safety requirements for technical specification of nuclear facilities

Nuclear Safety Requirements BSR-1.8.3-2017 "Technical Specification of Nuclear Facilities"[15] were adopted by the Head of VATESI in 2017 and will come into force on 1 May 2018. The main objective of the requirements is to establish regulatory measures allowing the transfer of safety important information from the site evaluation stage to the design stage. These requirements establish the contents of the technical specification of nuclear facilities and specify requirements and information that must be implemented in the design of nuclear facilities.

Amendment to the requirements for modifications of nuclear facilities

Nuclear Safety Requirements BSR-1.8.2-2015 "Categories of Modifications of Nuclear Facility and Procedure of Performing the Modifications", which were approved by the Head of VATESI, were amended in 2017.[16] The objective of the amendment is to improve the regulation of modifications performed during the construction and commissioning phases and to streamline the regulation of modifications of organisation structure.

13. Order No. 22.3-198 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 22.3-89, 27 September 2011, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.9.1-2011 "Standards of Release of Radionuclides from Nuclear Installations and Requirements for the Plan on Release of Radionuclides", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/a41dd960be2011e79122ea2db7aeb5f0.
14. Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom, OJ L 13 (17 Jan. 2014) (Euratom Basic Safety Standards).
15. Order No. 22.3-222 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BST-1.8.3-2017 "Technical Specification of Nuclear Facilities", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/9eba9ab0d11411e7910a89ac20768b0f.
16. Order No. 22.3-173 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of the Order No. 22.3-99, 7 October 2011, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.8.2-2015 "Categories of Modifications of Nuclear Facility and Procedure of Performing the Modifications", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/169582f0a9a311e78a4c904b1afa0332.

New requirements for managing human resources

New Nuclear Safety Requirements BSR-1.4.3-2017 "Managing Human Resources in the Field of Nuclear Energy" were adopted in 2017 by the Head of VATESI.[17] As the new requirements replaced several existing legal acts, the main objective of the new requirements was to introduce relevant good practices in the human resources management area. The new requirements also set more detailed provisions for training particular groups of employees, including their internal certification.

Amendment of nuclear safety requirements regarding programme on safety improvement measures

The Amendment of Nuclear Safety Requirements BSR-2.1.2-2010 "General requirements on assurance of safety of nuclear power plants with RBMK-1500 type reactors", adopted by the Head of VATESI in August 2017,[18] introduces requirements for the contents of the Programme on Safety Improvement Measures and its submission for review by the regulatory body. The Amendment came into force on 1 May 2018.

Amendment to the nuclear safety requirements for inspections

Nuclear Safety Requirements BSR-1.1.3-2016 "Inspections Conducted by the State Nuclear Power Safety Inspectorate", approved by Head of VATESI, were amended.[19] The main objective of the amendment was to establish the periodicity of inspections of certain areas of activities and establish procedures for the drafting and using of questionnaires for inspections of the implementation of requirements for physical security, safety of radioactive sources and non-proliferation of nuclear weapons.

Radioactive waste management

Amendment to the requirements for pre-disposal management of radioactive waste at nuclear facilities

A new version of Nuclear Safety Requirements BSR-3.1.2-2017 "Pre-disposal Management of Radioactive Waste at the Nuclear Facilities"[20] was adopted by the Head of VATESI in 2017. The main objective of the amendment was to supplement the requirements with the provisions related to: evaluation of external and seismic hazards; evaluation of sites of radioactive waste management facilities; requirements on design, safety assessment and commissioning of radioactive waste

17. Order No. 22.3-160 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.4.3-2017 "Managing Human Resources in the Field of Nuclear Energy", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/34a274709ddb11e79127a823199cc174.
18. Order No. 22.3-136 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 2.3-16, 5 February 2010, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-2.1.2-2010 "General Requirements on Assurance of Safety of Nuclear Power Plants with RBMK-1500 Type Reactors", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/4f662ea0790a11e7827cd63159af616c.
19. Order No. 22.3-112 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 22.3-82, 25 August 2011, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-1.1.3-2016 "Inspections Conducted by the State Nuclear Power Safety Inspectorate", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/f79893805ff411e79198ffdb108a3753.
20. Order 22.3-132 (2017) of the Head of State Nuclear Power Safety Inspectorate on the Amendment of Order No. 22.3-120, 31 December 2010, approved by the Head of State Nuclear Power Safety Inspectorate on the Approval of Nuclear Safety Requirements BSR-3.1.2-2010 "Pre-disposal Management of Radioactive Waste at the Nuclear Facilities", available (in Lithuanian) at: www.e-tar.lt/portal/lt/legalAct/84e522b075e111e7827cd63159af616c.

management facilities, as well as periodic safety assessment. New requirements on temporary storage of very low level radioactive waste in order for the radionuclides to decay to clearance levels and requirements for characterisation of radioactive waste were added.

Portugal

General legislation, regulations and instruments

Newly appointed President of COMRSIN

By Order No. 7354/2017 of 4 August 2017, the Portuguese Government appointed Pedro Manuel Horta do Rosário as President of the Regulatory Commission for the Safety of Nuclear Facilities (Comissão Reguladora para a Segurança das Instalações Nucleares) (COMRSIN).[21] Mr Rosário replaces Professor António Carlos de Sá Fernandes, appointed by Order No. 4382/2012, of 20 March 2012. Mr Rosário is a graduate in Physical and Technological Engineering of the Higher Institute of Technology (Instituto Superior Técnico) of the University of Lisbon. He has been and remains an employee of the General Directorate of Health (Direção Geral de Saúde) since 2004. During this time, he has been responsible for managing the enforcement of the bulk of the rules on radiological protection, a wealth of experience and competences to which he now adds responsibility for nuclear safety and radioactive waste management.

Nuclear safety and radiological protection (including nuclear emergency planning)

Amendment of regime on planning and programming measures for radiological emergencies and nuclear accidents

Law No. 84/2017 of 18 August 2017, amended Decree-Law No. 36/95 of 14 February 1995 and Decree-Law No. 174/2002 of 25 July 2002.[22] Decree-Law No. 36/95, transposing Council Directive 89/618/Euratom,[23] refers to information to be given to the general public regarding health protection measures in case of a radiological emergency. Decree-Law No. 174/2002 establishes rules applicable to interventions in case of a radiological emergency and transposes Title IX, "Intervention", of Council Directive 96/29/Euratom.[24] This Law updates and develops obligations concerning the planning and programming of measures to take in case of a radiological emergency or nuclear accident, by way of improving: collective risk prevention; minimisation of hazardous effects; search and rescue programmes; and the protection of ecosystems. It is the result of a Parliamentary initiative of the Green Party, in reaction to the public debate generated in Portugal around the life extension of the Almaraz nuclear power plant in Spain.

Reinforcing safety, control and decision-making processes

The Portuguese Government adopted Decree-Law No. 135/2017 of 20 October 2017, amending Decree-Law No. 30/2012 of 9 February 2012 and Decree-Law No. 262/2012

21. *Despacho* n. 7354/2017 (Order No. 7354/2017), *Diário da Repúblic*a (Official Gazette) II, No. 161/2017 (22 Aug. 2017), pp. 18181-18182.
22. *Lei* n. 84/2017 (Law No. 84/2017), *Diário da República* (Official Gazette) I, No. 159/2017 (18 Aug. 2017), pp. 4848-4850.
23. Council Directive 89/618/Euratom of 27 November 1989 on informing the general public about health protection measures to be applied and steps to be taken in the event of a radiological emergency, *Official Journal of the European Union* (OJ) L 357 (7 Dec. 1989), p. 31.
24. Council Directive 96/29/Euratom of 13 May 1996 laying down basic safety standards for the protection of the health of workers and the general public against the dangers arising from ionizing radiation, OJ L 159 (29 June 1996).

of 17 December 2012.[25] This Decree-Law transposes the 2014 Amended Safety Directive.[26] But, the transposition is incomplete. Rules regarding the creation of an independent regulatory entity were left to an upcoming general revision of the institutional framework concerning radiological protection and nuclear safety, to be carried out with the transposition of the Euratom Basic Safety Standards Directive.[27]

Radioactive waste management

National programme for the management of irradiated fuel and radioactive waste

In September 2017, the Portuguese Government adopted Council of Ministers Resolution No. 122/2017 of 7 September 2017, adopting the National Programme for the Management of Irradiated Fuel and Radioactive Waste for 2015-2019.[28] The adoption of this national programme was foreseen in Decree-Law No. 156/2013 of 5 November 2013, transposing Council Directive 2011/70/Euratom.[29] Its purpose is to guarantee the safe management of irradiated fuel and radioactive waste, setting out the overall framework for the activities of national entities with responsibilities in this area. It includes an inventory of existing material of this nature in Portugal and an estimate of future production, as well as defining who, how and when it should be disposed of. This programme does not apply to radioactive waste resulting from accidents, in accordance with Article 3(b) of Decree-Law No. 262/2012 of 17 December 2012.

Radioactive substances present in water destined for human consumption

The Portuguese Government adopted Decree-Law No. 152/2017 of 7 December 2017, amending Decree-Law No. 306/2007 relating to the quality of water destined for human consumption, as well as transposing Commission Directive (EU) 2015/1787 and Council Directive 2013/51/Euratom.[30] The transposition of Council Directive 2013/51/Euratom is found in Part IV of Annex I (Control of the indicative dose and characteristics of the analytical functional behaviour), Part C of Annex II (Control of radioactive substances) and Framework 3 of Annex IV (Minimal characteristics of performance "detection limit" of radioactive parameters).

25. *Decreto-Lei n.º 135/2017* (Decree-Law No. 135/2017), *Diário da República* (Official Gazette) I, No. 203/2017 (20 Oct. 2017), pp. 5749-5754.
26. Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, OJ L 219 (25 July 2014) (2014 Amended Safety Directive).
27. Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom, OJ L 13 (17 Jan. 2014) (Euratom Basic Safety Standards).
28. *Resolução do Conselho de Ministros n.º 122/2017* (Council of Ministers Resolution No. 122/2017), *Diário da República* (Official Gazette) I, No. 173/2017 (7 Sept. 2017), pp. 5298-5313.
29. Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, OJ L 199 (2 Aug. 2011) (Waste Directive).
30. *Decreto-Lei n.º 152/2017* (Decree-Law No. 152/2017), *Diário da República* (Official Gazette) I, No. 235/2017 (7 Dec. 2017), pp. 6555-6576. Commission Directive (EU) 2015/1787 of 6 October 2014 amending Annexes II and III to Council Directive 98/83/EC on the quality of water intended for human consumption, OJ L 260 (7 Oct. 2015); Council Directive 2013/51/Euratom of 22 October 2013 laying down requirements for the protection of the health of the general public with regard to radioactive substances in water intended for human consumption, OJ L 296 (7 Oct. 2013).

Slovenia

Nuclear safety and radiological protection (including nuclear emergency planning)

New Ionising Radiation Protection and Nuclear Safety Act

At its session on 12 December 2017, the National Assembly of the Republic of Slovenia adopted the new Ionising Radiation Protection and Nuclear Safety Act (ZVISJV-1), which was published in the *Official Gazette of the Republic of Slovenia* No. 76/2017 on 22 December 2017 and entered into force 15 days after its publication, i.e. on 6 January 2018. ZVISJV-1 completely replaced the current act of the same name from 2002, last amended in 2015.

ZVISJV-1 transposes the contents of the Euratom Basic Safety Standards Directive[31] and it was determined that due to the number of amendments it was better to prepare a new act rather than keep supplementing the previous act. But, ZVISJV-1 largely follows the same fundamental goals and principles of the previous act and regulates everything needed:

- to minimise the exposure of individuals to ionising radiation either due to natural sources of radiation or due to the use of radiation sources for industrial or research purposes or in health and veterinary medicine;
- to minimise the possibility of a nuclear or radiological emergency;
- to minimise the consequences in the event of such an accident as effectively as possible; and
- to prevent any harmful or prohibited use of nuclear or radioactive substances.

Since Slovenian experts had been participating in the preparation of the Euratom Basic Safety Standards Directive, they were acquainted with the changes that it brought well before its adoption. The provisions of the Directive are based on the latest findings of radiological protection experts, summarised in ICRP (International Commission on Radiological Protection) reports. These reports are recognised almost universally in all countries of the world as radiological protection standards and are transposed into legal systems.

With the adoption of the ZVISJV-1, most of the provisions of the latest radiological protection standards were transposed into Slovenian legislation. However, some of the operational details are still left to be transposed into the decrees and rules, which will be adopted in the coming weeks and months. In addition, some of the provisions of the 2014 Amended Safety Directive,[32] which was adopted based on the lessons learnt from the Fukushima Daiichi nuclear power plant accident in 2011, were also introduced in ZVISJV-1.

ZVISJV-1 was drafted by the Slovenian Nuclear Safety Administration in close co-operation with the Slovenian Radiation Protection Administration. First drafts of the articles were prepared by the end of 2014 and then for more than a year co-ordinated within the two agencies. In October 2016, the draft was publicly

31. Council Directive 2013/59/Euratom of 5 December 2013 laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, and repealing Directives 89/618/Euratom, 90/641/Euratom, 96/29/Euratom, 97/43/Euratom and 2003/122/Euratom, *Official Journal of the European Union* (OJ) L 13 (17 Jan. 2014) (Euratom Basic Safety Standards).
32. Council Directive 2014/87/Euratom of 8 July 2014 amending Directive 2009/71/Euratom establishing a Community framework for the nuclear safety of nuclear installations, OJ L 219 (25 July 2014) (2014 Amended Safety Directive).

announced for the first time. It was followed by almost half a year of co-ordination with experts, radiological protection practitioners and operators of radiation and nuclear facilities. In the spring of 2017, the text was co-ordinated with the ministries and government offices for several months. The draft was also sent to the European Commission for review. In July 2017, the Government approved the proposal of ZVISJV-1 and sent it to the National Assembly, where it was adopted in mid-December 2017.

Switzerland

Nuclear safety and radiological protection (including nuclear emergency planning)

Review of Articles 34 and 34a of the Nuclear Energy Ordinance[33] *and proof of safety for long-term operation*

At its session of 26 April 2017, the Federal Council approved the partial review of the Nuclear Energy Ordinance (NEO). The new provisions came into force on 1 June 2017.

The basic requirements for proof of safety for nuclear power stations are now explicitly set out in the ordnance, increasing legal certainty for both operators and the authorities. These requirements were previously regulated only by a directive issued by the Swiss Federal Nuclear Safety Inspectorate (ENSI).[34] For operators, therefore, the periodic safety review (PSR) to be carried out in 2017 is now mandatory. From the fourth decade of operation, the PSR now also includes a requirement for the submission of proof of safety for long-term operation (LTO), defined under new Article 34a of the NEO.[35] Over and above the requirements of the ENSI-A03 Directive, operators must also provide information about the planned duration of operation and the measures implemented to ensure that the requisite staff and technical knowledge are in place.

For nuclear power stations that were already required to present a full PSR in 2017, including proof of safety for LTO, a transitional provision allows ENSI to extend the deadline for submission of these documents to the end of 2019 on request.

Entry into force of the new law on radiation protection on 1 January 2018

The law on radiation protection is designed to protect people from the dangers of ionising radiation, whether of man-made or of natural origin, and covers all issues relevant to the subject of ionising radiation (training, authorisation, surveillance, dosimetry, waste, environment, research, emergency situations, etc.). It applies to all fields: medicine, research, industry and nuclear installations.

The new law updated the legislation in light of new science, technical developments and international directives. International directives have moved on from the old approach to radiation protection, based on activities and interventions, and are now based on the three categories of potential human exposure: planned exposure (where the source of radiation is under control), existing exposure (which includes legacy sites, background radiation and post-accident sites) and emergency exposure (where the source of radiation is not controlled and the population is threatened).

33. Nuclear Energy Ordinance of 10 December 2004 (NEO), *Recueil systématique du droit fédéral* (RS) [Classified compilation] 732.11.
34. Directive ENSI-A03 of October 2014 on the Periodic Safety Review for Nuclear Power Plants. Available, in German, at: www.ensi.ch/de/dokumente/richtlinie-ensi-a03-deutsch/.
35. The draft provisions and report on the partial review of Articles 34 and 34a of the NEO is available, in French, and also in German and Italian, at: www.admin.ch/ch/f/gg/pc/ind2016.html#DETEC.

The principal improvements of the new law[36] are:

- The authorisation procedure and surveillance are based on degrees of risk. Accordingly, in cases where risk is minimal, the procedure is streamlined and surveillance reduced.
- Radiation safety will be stepped up with tighter controls for radioactive sources.
- To give medical patients greater protection from needless exposure to radiation, the new law provides for clinical audits in hospitals and radiology departments. This measure is designed to prevent unjustified examinations and therapies. These audits will be conducted in collaboration with professional medical companies.
- Exposure to radon in buildings must be given greater attention nationwide. A new benchmark of 300 becquerels per cubic metre is now applied for this naturally occurring radioactive gas in residential and non-residential premises. This limit is particularly important for new builds and renovations. Other new provisions apply to legacy sites, requiring the measurement and, if necessary, the remediation of the buildings concerned. A current example concerns sites contaminated by radium when it was in use by the watch-making industry.
- Levels below which the radioactivity of a substance is considered harmless have been aligned with international standards in order to improve the protection of the population and to facilitate the cross-border transportation of goods such as special materials for recycling.
- People exposed to radiation in the workplace are better protected: in order to prevent cataracts, the maximum dose for the lens of the eye has been lowered. This measure mainly concerns medical staff working with X-rays. The new law also takes greater account of natural sources of radiation to which workers are exposed, in water distribution centres, for example, or when building tunnels. Flying staff are now also considered to be exposed to radiation in the workplace, and annual radiation exposure will therefore be individually assessed for both pilots and cabin crew.
- Continuous, regular training in radiological protection is now mandatory. The necessary skills, aptitudes and knowledge are regulated, as is already the case for the training content. All people using ionising radiation must attend ongoing radiological protection training at least every five years. The new law also covers new professions, such as operating room technicians.

Radioactive waste management

Sectoral plan for deep geological repositories and Stage 2 consultation

At its session of 22 November 2017, the Federal Council launched the public consultation for the second stage of the procedure for selecting sites for deep geological repositories. The sectoral plan for "Deep geological repositories" sets out the procedure for finding sites for future deep geological repositories for radioactive

36. More information on the principal improvements is available, in French, at: www.bag.admin.ch/bag/fr/home/themen/mensch-gesundheit/strahlung-radioaktivitaet-schall/strahlung-gesundheit/totalrevision-der-verordnungen-im-strahlenschutz.html.

waste.[37] Stage 2 began in late 2011 and should be completed by the end of 2018 when the Federal Council approves the report on the results of this stage. This report was made available for public consultation alongside the reports, surveys and position statements drawn up during Stage 2. It sets out the Federal Council's proposal to carry out an in-depth examination of the three siting areas, namely East Jura, North Lägern and northeast Zurich, during the third and final stage of site selection. The consultation was open until 9 March 2018.

The general design of the sectoral plan for deep geological repositories was approved by the Federal Council in April 2008. It sets out the objectives, procedures and selection criteria for siting deep geological repositories in Switzerland. The long-term protection of people and the environment is its absolute priority. The selection procedure consists of three stages, the first of which was completed in 2011. The public is consulted at every stage. The Stage 2 consultation (2011-2018) includes the NAGRA reports (National Cooperative for the Disposal of Radioactive Waste), assessments by federal offices and position statements by the Commission of Cantons and regional conferences, in addition to other reports that were drawn up during Stage 2.

General legislation, regulations and instruments

New Nuclear Energy Act and withdrawal from nuclear energy

After the nuclear disaster at the Fukushima Daiichi nuclear power plant, the Federal Council decided in 2011 to gradually discontinue the use of nuclear power. Parliament followed this decision. In a referendum in May 2017, the Swiss people also gave their approval to the Energy Strategy 2050, which included terminating the use of nuclear power. The referendum question asked voters to ban the construction of new nuclear power stations. Existing installations can continue to operate as long as they remain safe; but they may not be replaced after decommissioning. The technology itself will not be banned; nuclear research may continue and will not be subject to restrictions under the Energy Strategy 2050. The Confederation will continue to support it.

Other changes include that spent fuel must be disposed of as radioactive waste. It may not be reprocessed and exported for this purpose.

The new NEA came into effect on 1 January 2018.[38]

United States

Nuclear installations

75th anniversary of the world's first atomic reactor

2 December 2017 marked the 75th anniversary of the world's first self-sustaining, controlled nuclear chain reaction in the Chicago Pile Number One reactor, or CP-1 for short, underneath the stands of the University of Chicago's football stadium in Chicago, Illinois. A team of scientists that included Enrico Fermi and Leo Szilard designed CP-1, which consisted of natural uranium rods enclosed by 40 000 graphite blocks held within a 24-square-foot wooden frame. While the reaction in CP-1 never

37. *Plan sectoriel "Dépôts en couches géologiques profondes" Consultation concernant la 2ème étape: rapport explicatif* [Sectoral Plan "Deep Geological Repositories" Consultation on 2nd Stage: Explanatory Report], available, in French, at: www.admin.ch/ch/f/gg/pc/documents/2910/2eme-etape-du-plan-sectoriel-du-Depots-en-couches-geologiques-profondes_Rapport-explicatif-v2_fr.pdf.
38. Nuclear Energy Act (NEA) of 21 March 2003, RS 732.1, www.admin.ch/opc/en/classified-compilation/20010233/index.html. The new NEA articles are: 9, 12, 12a, 74a and 106 (1bis and 4).

exceeded a half watt that day and ended after about five minutes, the event was critical to the development of atomic weapons and nuclear power reactors.

Holtec International, Inc. submits application for interim storage facility to the NRC

By letter dated 30 March 2017, as supplemented on 13 April 2017, Holtec International, Inc. (Holtec) submitted an application for a specific independent spent fuel storage installation (ISFSI) licence to construct and operate a consolidated interim storage facility in Lea County, New Mexico. Holtec plans to use HI-Storm UMAX canisters to store up to 5 000 metric tons of commercial spent nuclear fuel for a 40-year licence term. On 7 July 2017, the Nuclear Regulatory Commission (NRC) staff informed Holtec that the company needed to submit supplemental technical information before the agency could accept the application for a detailed review.[39]

NRC licensing activity

On 2 June 2017, the NRC issued a Combined License (COL) to Virginia Electric and Power Company (doing business as Dominion Virginia Power) for an Economic Simplified Boiling Water Reactor (Unit 3) at the North Anna Power Station site in the US state of Virginia.[40] Additionally, on 28 September 2017, the NRC renewed the operating licences of South Texas Project Unit 1 and Unit 2 for an additional 20 years.[41] The NRC has now renewed 89 commercial nuclear power reactor licences, with an additional 5 renewals currently under review.

General legislation, regulations and instruments

NRC publishes guidance on subsequent licence renewals for power reactors

On 14 July 2017, the NRC published guidance documents on licence renewal for commercial nuclear power reactors following the initial 20-year licence renewal period.[42] Under the Atomic Energy Act, initial operating licences for commercial power reactors are limited to a 40-year term.[43] Thereafter, NRC regulations allow for 20-year licence renewals to extend the operating period to 60 years.[44] With subsequent licence renewal, licensees can apply for another period of extended operation from 60 years to 80 years.[45] The newly issued guidance on subsequent licence renewals consists of two documents: (1) the Generic Aging Lessons Learned for Subsequent License Renewal Report[46] and (2) the Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants.[47] The GALL-SLR Report sets forth guidance on how licensees can acceptably document

39. More information on Holtec International's licence application can be found at: www.nrc.gov/waste/spent-fuel-storage/cis/holtec-international.html.
40. Virginia Electric and Power Company; North Anna Unit 3, 82 Federal Register (Fed. Reg.) 27296 (14 June 2017).
41. STP Nuclear Operating Company; South Texas Project, Units 1 and 2, 82 Fed. Reg. 46311 (28 Sept. 2017).
42. Final Guidance Documents for Subsequent License Renewal, 82 Fed. Reg. 32588 (14 July 2017); NRC (2017), Standard Review Plan for Review of Subsequent License Renewal Applications for Nuclear Power Plants (SRP-SLR), NUREG-2192, NRC, Washington, DC; NRC (2017), Generic Aging Lessons Learned for Subsequent License Renewal (GALL-SLR) Report, NUREG-2191, NRC, Washington, DC. Both the SRP-SLR and GALL-SLR can be found at: www.nrc.gov/reactors/operating/licensing/renewal/slr/guidance.html.
43. AEA, 42 United States Code (USC) § 2233(c); 10 CFR § 50.51(a). CFR refers to the Code of Federal Regulations, the official compilation of regulations issued by federal governmental agencies in the US. The NRC's regulations are published in Title 10 of the CFR, ranging from Parts 1 through 199.
44. See generally 10 CFR Part 54. There are no specific limitations in the Atomic Energy Act or the NRC's regulations restricting the number of times a licence may be renewed.
45. 82 Fed. Reg. 32588, *supra* note 41.
46. GALL-SLR, *supra* note 42.
47. SRP-SLR, *supra* note 42.

that their plants have adequate ageing management programmes and demonstrate that there is reasonable assurance the plants will operate safely beyond 60 years. The Standard Review Plan provides guidance to the NRC staff on the review of subsequent licence renewal applications.

NRC issues Regulatory basis for decommissioning rulemaking

On 27 November 2017, the NRC staff published the Regulatory Basis for proposed regulatory improvements for nuclear power reactors transitioning to decommissioning.[48] Under the NRC's current framework, licensees with plants going through the decommissioning process typically seek exemptions from certain NRC regulations, as well as amendments to their operating licences, to reflect the changed status of permanently shutdown and defueled reactors and the reduced risks to public health and safety as compared to operating reactors.[49] In the November 2017 Regulatory Basis, the NRC staff recognised the inefficiencies and regulatory burden of the current amendment and exemption process, stating that "[t]he decommissioning process can be improved and made more efficient, open, and predictable by reducing the reliance on licensing actions (i.e. license amendment and exemption requests) to achieve a sustainable regulatory framework during decommissioning."[50] To achieve this objective, the NRC staff recommends rulemaking to implement a number of changes to NRC regulations, including, but not limited to, changes in the following regulatory areas as they relate to decommissioning power reactors: emergency preparedness, physical security, cyber security, drug and alcohol testing, training requirements for certified fuel handlers, decommissioning trust funds, off-site and on-site financial protection requirements and indemnity agreements, and application of backfitting provisions.[51] In 2018, the NRC staff plans to publish a proposed rule for public comment on the changes to the NRC's decommissioning regulatory framework.

48. Regulatory Improvements for Power Reactors Transitioning to Decommissioning, Regulatory Basis Document, 82 Fed. Reg. 55954 (27 Nov. 2017). The Regulatory Basis for the decommissioning rulemaking can be found at: www.nrc.gov/docs/ML1721/ML17215A010.pdf.
49. Regulatory Basis, *supra* note 48, p. 21.
50. *Ibid*., pp. 1, 27.
51. *Ibid*., pp. 2-3. The NRC's backfitting regulations in 10 CFR Parts 50, 70, 72, and 76 require the NRC to justify, using a formal and systematic process, any new or changed requirements or staff positions that the agency seeks to impose on nuclear power reactor licensees and certain nuclear materials licensees. Issue finality requirements in 10 CFR Part 52 provide backfitting-like protection to certain holders of NRC approvals issued under Part 52.

Intergovernmental organisation activities

European Atomic Energy Community

Institutional issues

Communication from the Commission to the European Council (Article 50) on the state of progress of the negotiations with the United Kingdom under Article 50 of the Treaty on European Union[1]

In the context of the ongoing negotiations on the withdrawal of the United Kingdom from the European Union, the Commission published a Communication on the progress of the negotiations in December 2017. According to the Communication, as regards the Euratom Community (nuclear specific) issues, the Commission and UK negotiators have agreed to principles for addressing the key separation issues relating to the UK's withdrawal from the Euratom Community. This includes:

- an agreement that the UK will be responsible for international nuclear safeguards in the UK and is committed to a future regime that provides coverage and effectiveness equivalent to existing Euratom Community arrangements;
- agreed principles on ownership of special fissile material (save for material held in the UK by EU27 entities); and
- agreed principles on responsibility for spent fuel and radioactive waste.

Non-legally binding instruments

Third report on the State of the Energy Union[2]

The Energy Union project is one of the ten political priorities of the current Commission.[3] The five pillars of the Energy Union are: energy security, solidarity and trust; a fully integrated European energy market; energy efficiency; climate action; and research, innovation and competitiveness.

The third report on the State of the Energy Union, published on 23 November 2017, looks at progress made since the last State of the Energy Union report in February 2017 and assesses the challenges to be addressed. The EU is advancing towards its 2020 and 2030 energy and climate targets. It also continues to build an Energy Union with secure, affordable and climate-friendly energy. It concludes that the Energy Union project has reached a critical juncture. The Commission will therefore continue its efforts to implement the enabling actions that bring changes

1. Communication from the Commission to the European Council (Article 50) on the state of progress of the negotiations with the United Kingdom under Article 50 of the Treaty on European Union, COM(2017) 784 final (8 Dec. 2017).
2. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, Third Report on the State of the Energy Union, COM(2017) 688 final (23 Nov. 2017).
3. See Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee, the Committee of the Regions and the European Investment Bank, "A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy", COM(2015) 80 final (25 Feb. 2015).

on the ground and tangible benefits to all Europeans. The report states *inter alia* that energy is a major focus of EU co-operation with its neighbours. The priority therefore as regards the external dimension of the Energy Union is on promoting regulatory and market reforms, promoting energy efficiency and the use of renewable energies, building interconnections, fostering security of energy supply, and promoting the highest standards of nuclear safety.

Report on the progress of implementation of Council Directive 2011/70/Euratom[4]

Under Article 14(2) of the Directive 2011/70/Euratom,[5] the European Commission is required to submit to the European Parliament and Council, every three years, a report on progress made on the implementation of the Waste Directive and an inventory of radioactive waste and spent fuel present in the territory of the Euratom Community, including future prospects.

The report concludes that the EU nuclear legal framework has undergone significant changes in the last decade with the adoption of legislation on nuclear safety, radioactive waste and spent fuel management and radiological protection. Through the implementation of the Waste Directive, member states are required to demonstrate that they have taken reasonable steps to ensure that no undue burden is passed to future generations and that radioactive waste and spent fuel is managed safely.

The Commission acknowledges that there is still important work ahead to ensure the long-term safe and responsible management of radioactive waste and spent fuel. Policy decisions on final disposal facilities are required, as are adequate cost estimates and financing mechanisms to ensure that funds are available when needed and no undue burdens are passed to future generations. In this regard, as per the report, the periodic international peer reviews of the national programmes, frameworks and competent regulatory authorities are of high importance in building stakeholders' trust and confidence in the management of these materials in the EU. The Commission will continue to promote an open and transparent dialogue and facilitate the exchange of good practices and knowledge.

Published reports

Euratom Supply Agency (ESA): Annual Report 2016[6]

The ESA has continued, over the course of 2016, to assume responsibility for the EU nuclear common supply policy, in the interest of a regular and equitable access to supply for EU users. In close co-operation with its Advisory Committee, the ESA has promoted, through the activities of the Nuclear Market Observatory, transparency and predictability in that field.

Follow-up work to the Memorandum of Understanding (MOU) between the ESA and the United States Department of Energy/National Nuclear Security Administration (DOE-NNSA) on the exchange of high-enriched uranium (HEU)

4. Report from the Commission to the Council and the European Parliament on progress of implementation of Council Directive 2011/70/Euratom and an inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects, COM(2017) 236 final (15 May 2017). See also Commission Staff Working Document: Progress of implementation of Council Directive 2011/70/Euratom, SWD(2017) 159 final (15 May 2017) and Commission Staff Working Document: Inventory of radioactive waste and spent fuel present in the Community's territory and the future prospects, SWD(2017) 161 final (15 May 2017).
5. Council Directive 2011/70/Euratom of 19 July 2011 establishing a Community framework for the responsible and safe management of spent fuel and radioactive waste, *Official Journal of the European Union* (OJ) L 199 (2 Aug. 2011) (Waste Directive).
6. EC (2017), EURATOM Supply Agency: Annual Report 2016, European Union.

continued in 2016. The MOU aims to ensure the supply of HEU for European research reactors and producers of radioisotopes in conformity with the policy of HEU reduction in civil uses, which has been developed through the Nuclear Security Summit process. The release of a joint statement by the ESA and the DOE-NNSA in March 2016, on the margins of the Washington Nuclear Security Summit, was one of the year's highlights.

Security of fuel supply for research reactors, in the interest of both scientific research and the production of radioisotopes, for the period after the future conversion of such reactors to operate with low-enriched uranium (LEU, 19.75%), continued to draw the attention of the ESA. Over the course of the year, the ESA published the *Report on Securing the European Supply of 19.75% Enriched Uranium Fuel*.[7] The report was published to further feed public reflection on the matter, in agreement with ESA's Advisory Committee.

International Atomic Energy Agency

60th anniversary of the entry into force of the IAEA Statute

The Statute was approved on 23 October 1956 by the Conference on the Statute of the International Atomic Energy Agency (IAEA), which was held at the Headquarters of the United Nations. It came into force on 29 July 1957, upon fulfilment of the relevant provisions of paragraph E of Article XXI. Since then, membership in the IAEA has grown from the 26 founding members to 170 states today.[8]

In a statement[9] to mark the 60-year anniversary, IAEA Director-General Yukiya Amano noted that "The IAEA is proud to celebrate six decades of serving the world. Our motto is *Atoms for Peace and Development*." "The IAEA has faced many challenges in the past 60 years. But it has proven to be flexible and able to learn from experience. We have kept pace with the changing needs of Member States," Mr Amano said. "As we begin our seventh decade, I am confident that, with the active support of our Member States, we will deal successfully with all the challenges that lie ahead." Mr Amano further committed that the Agency "will remain an international organisation of excellence that delivers concrete results and makes a real difference to the lives of people all over the world."

61st session of the IAEA General Conference

The 61st regular session of the IAEA General Conference was held in Vienna, Austria, from 18 to 22 September 2017. Close to 2 500 participants attended the Conference, including delegates from 157 of the IAEA's 168 member states (at the time of the General Conference).[10] Throughout the week, delegates were able to also attend more than 50 side-events showcasing activities and special programmes by the IAEA Secretariat, as well as by several member states.

7. EC (2016), Report on Securing the European Supply of 19.75% enriched Uranium Fuel, Euratom Supply Agency, Advisory Committee WG Report.
8. IAEA (2018), "List of Member States", www.iaea.org/about/governance/list-of-member-states (accessed 22 May 2018).
9. IAEA (2017), "Statement on 60th Anniversary of Entry into Force of IAEA Statute", www.iaea.org/newscenter/statements/statement-on-60th-anniversary-of-entry-into-force-of-iaea-statute.
10. Having deposited its Instrument of Acceptance of the IAEA Statute with the depositary government, Saint Vincent and the Grenadines became a member of the Agency on 4 December 2017, raising the number of IAEA member states to 169. Grenada became a member state in 2018.

Resolutions of the Conference

A number of resolutions were adopted by the Conference. As in previous years, resolution GC(61)/RES/8 on "Measures to strengthen international cooperation in nuclear, radiation, transport and waste safety", as well as resolution GC(61)/RES/9 on "Nuclear Security", include sections that are of legal relevance. All resolutions adopted during the 61st regular session of the General Conference are available on the IAEA website at: www.iaea.org/About/Policy/GC/GC61/Resolutions/index.html.

Measures to strengthen international cooperation in nuclear, radiation, transport and waste safety (GC(61)/RES/8)

Regarding the Convention on Nuclear Safety,[11] the General Conference urged "all Member States that have not yet done so, especially those planning, constructing, commissioning or operating nuclear power plants, or considering a nuclear power programme, to become Contracting Parties to the CNS". The Conference also stressed "the importance of CNS Contracting Parties fulfilling the obligations stemming from the Convention and reflecting these in their actions to strengthen nuclear safety and in particular when preparing National Reports, and actively participating in peer reviews for CNS Review Meetings".

Concerning the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management,[12] the Conference likewise urged "all Member States that have not yet done so, including those managing radioactive waste from the use of radioactive sources and nuclear energy, to become Contracting Parties to the Joint Convention". It also stressed "the importance of Joint Convention Contracting Parties fulfilling the obligations stemming from the Convention and actively participating in peer reviews for the 6th Review Meeting in 2018".

The Conference further urged "all Member States that have not yet done so to become Contracting Parties to the Early Notification Convention and the Assistance Convention", and stressed "the importance of Contracting Parties fulfilling the obligations stemming from these conventions, and actively participating in regular meetings of the Representatives of Competent Authorities".

In this context, the Conference requested "the Secretariat, in collaboration with regional and international organizations and Member States, to continue its activities to promote the importance of conventions concluded under the auspices of the IAEA, and to assist Member States, upon request, with adherence and participation".

With respect to the Code of Conduct on the Safety and Security of Radioactive Sources, the General Conference welcomed "the approval by the Board of Governors of the supplementary Guidance on the Management of Disused Radioactive Sources to the Code of Conduct on the Safety and Security of Radioactive Sources", and endorsed the Guidance while recognising that it was not legally binding. It also called "on all Member States to make a political commitment to implement the Code of Conduct on the Safety and Security of Radioactive Sources and its supplementary Guidance on the Import and Export of Radioactive Sources and its supplementary Guidance on the Management of Disused Radioactive Sources". It further called "on all Member States to act in accordance with the Code and the Guidance", and requested "the Secretariat to continue supporting Member States in this regard".

11. Convention on Nuclear Safety (1994), IAEA Doc. INFCIRC/449, 1963 UNTS 293, entered into force 24 October 1996 (CNS).
12. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (1997), IAEA Doc. INFCIRC/546, 2153 UNTS 357, entered into force 18 June 2001 (Joint Convention).

Similarly, the Conference urged "Member States with research reactors to apply the guidance of the Code of Conduct on the Safety of Research Reactors".

Regarding civil liability for nuclear damage, the General Conference encouraged "Member States to work towards establishing a global nuclear liability regime and, as appropriate, to give due consideration to the possibility of joining the international nuclear liability instruments".

Nuclear Security (GC(61)/RES/9)

In the context of nuclear security, the Conference reaffirmed "the central role of the Agency in strengthening the nuclear security framework globally and in coordinating international activities in the field of nuclear security, while avoiding duplication and overlap".

The Conference also reaffirmed "the importance of the Convention on the Physical Protection of Nuclear Material (CPPNM) and its 2005 Amendment extending its scope", welcomed "the entry into force of that Amendment", recognised "the importance of acceptance, approval or ratification by further States" and noted "the importance of its full implementation and universalization".

The Conference also encouraged "all Parties to the CPPNM and its 2005 Amendment to fully implement their obligations thereunder" and encouraged "States that have not yet done so to become party to this Convention and its Amendment". It further encouraged "the Agency to continue efforts to promote further adherence to the Amendment with the aim of its universalization". The Conference welcomed "the organization by the Secretariat of CPPNM meetings" and encouraged "all States Parties to the Convention to participate in relevant meetings".

IAEA Treaty Event

The yearly IAEA Treaty Event took place during the 61st session of the IAEA General Conference. During the event, Bolivia and Monaco deposited instruments of ratification and, respectively, acceptance of the Amendment to the Convention on the Physical Protection of Nuclear Material;[13] and Syria deposited an instrument of ratification to the CNS. Participants from several IAEA member states were also briefed on the relevant multilateral treaties relating to nuclear safety, security and civil liability for nuclear damage.

Joint Convention

Side event to mark the 20th anniversary of the adoption of the Joint Convention

On the occasion of the 20th anniversary of the adoption of the Joint Convention, a side event was organised by the IAEA, on 18 September 2017, on the margins of the 61st session of the IAEA General Conference. In his opening remarks, IAEA Deputy Director-General and Head of the Department of Nuclear Safety and Security, Juan Carlos Lentijo, thanked all contracting parties to the Joint Convention and noted that "the Convention ha[d] contributed to a higher level of safety worldwide in the management of radioactive waste and spent fuel, and it will continue to do so in the future."

During the event, speakers involved in the elaboration, negotiation and review process under the Joint Convention offered an overview of its history, evolution and achievements, including future perspectives. Also, representatives from several contracting parties – in particular Canada, Cuba, Finland, Ghana and Japan – shared their experiences and views, stemming from participation in past Review Meetings.

13. Amendment to the Convention on the Physical Protection of Nuclear Material (2005), IAEA Doc. INFCIRC/274/Rev.1/Mod.1, entered into force 8 May 2016 (CPPNM Amendment).

Nuclear safety

IAEA activities to promote adherence to and implementation of the CNS and the Joint Convention

The CNS and the Joint Convention represent major cornerstones in the international legal framework for nuclear safety, and thus the IAEA has been working, as a priority, towards encouraging universal adherence to and implementation of these conventions. As part of these efforts, in addition to the regular outreach, tailored promotional activities, such as bilateral meetings and regional workshops, were devised and carried out in 2017, focusing on these two conventions.

A workshop to promote the CNS and the Joint Convention to member states from Asia and Latin America was held from 21 to 23 November 2017 in Vienna. Experts from Bolivia, Malaysia, Mongolia, Paraguay, Philippines, Singapore and Thailand attended the event.

A workshop to promote the Joint Convention to member states in the Africa region was held from 5 to 7 December 2017 in Rabat, Morocco. Experts from Burkina Faso, Egypt, Mali, Sudan and Uganda attended the event.

During the regional workshops, the participants learned about all aspects of the conventions, from their history, key requirements, peer-review process and achievements, to future prospects. Information on the procedure for how to become a contracting party to these international legal instruments was also provided. Participants further had an opportunity to experience, through practical exercises, how the review process works. Throughout the discussions, they also offered national perspectives, by making presentations and sharing experiences on policies and programmes related to the scope of the international legal instruments.

Open-ended Meeting of Legal and Technical Experts on the Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources (June 2017, Vienna)

The IAEA organised an Open-ended Meeting of Legal and Technical Experts on the Implementation of the Code of Conduct on the Safety and Security of Radioactive Sources in Vienna, Austria, in June 2017. At the meeting, 180 experts from 101 member states exchanged information and shared experiences on the establishment and implementation of financial provisions to ensure the safe management and secure protection of radioactive sources once they have become disused, including associated aspects encountered by regulatory bodies and other stakeholders.

Guidance on the Management of Disused Radioactive Sources

As mentioned above, the 61st IAEA General Conference endorsed a guidance document on the Management of Disused Radioactive Sources[14] (the Guidance), previously approved by the IAEA Board of Governors on 11 September 2017. This document stands as supplementary guidance to the Code of Conduct on the Safety and Security of Radioactive Sources,[15] at a similar level as the Guidance on the Import and Export of Radioactive Sources.[16]

The Guidance, which is not legally binding, aims to consolidate and provide further detail on the management of disused sources, consistent with the provisions

14. IAEA (2017), Code of Conduct on the Safety and Security of Radioactive Sources: Guidance on the Management of Disused Radioactive Sources, Report by the Director General, IAEA Doc. GC(61)/23.
15. IAEA (2004), Code of Conduct on the Safety and Security of Radioactive Sources, IAEA Doc. IAEA/CODEOC/2004.
16. IAEA (2012), Guidance on the Import and Export of Radioactive Sources, IAEA Doc. IAEA/CODEOC/IMO-EXP/2012.

of the Code of Conduct, in response to requests from member states. It is intended to be used by member states when establishing their relevant policies and strategies, as well as their legislation and regulations.

The text identifies actions needed to be taken, starting with the decision to acquire a radioactive source and continuing through disposal, to ensure that disused sources are safely and securely managed. It also advises on the available management options for disused sources, which include reuse or recycling, long-term storage and disposal and return to a supplier. International and regional co-operation is encouraged to enhance the management of disused sources and their transport.

Nuclear security

Technical Meeting of the Representatives of States Parties to the Convention on the Physical Protection of Nuclear Material (CPPNM) and the CPPNM Amendment (9-10 November 2017, Vienna)

A Technical Meeting of the Representatives of States Parties to the CPPNM[17] and the CPPNM Amendment took place from 9 to 10 November 2017 at IAEA Headquarters in Vienna and was attended by 72 participants from 50 parties to the CPPNM and the Amendment. The participants discussed matters such as the efforts towards universalisation of the CPPNM Amendment as well as full implementation through the development and strengthening of member states' legislative and regulatory frameworks for nuclear security, and improvements to the mechanisms for information sharing. Discussions relating to the preparation of the 2021 Conference of the States Parties to the CPPNM Amendment to review the implementation of the Convention were also held.

International Conference on the Physical Protection of Nuclear Material and Nuclear Facilities (13-17 November 2017, Vienna)

The IAEA organised, in co-operation with the World Institute for Nuclear Security, the World Nuclear Transport Institute and the International Criminal Police Organisation, the International Conference on the Physical Protection of Nuclear Material and Nuclear Facilities, from 13 to 17 November 2017, at the IAEA Headquarters in Vienna. The conference was attended by more than 650 participants from 95 member states and 10 international organisations. Six main panel sessions addressed a range of topics, including the universalisation and implementation of the CPPNM and CPPNM Amendment, the legislative and regulatory frameworks for the physical protection of nuclear material in use, storage and transport and for nuclear facilities, developing and sustaining a physical protection regime for nuclear material in use, storage and transport and for nuclear facilities, protection against unauthorised removal of nuclear material during use, storage and transport and sabotage of nuclear material and nuclear facilities, and international and regional co-operation. The Conference also included technical sessions addressing, *inter alia*, international transport, identification and assessments of threats, planning and preparedness for and response to nuclear security events and risk-based physical protection and measures.

Nuclear liability

Workshops on civil liability for nuclear damage

The IAEA organised two workshops on civil liability for nuclear damage in 2017. The first one, a sub-regional workshop for Latin American countries, was held in

17. Convention on the Physical Protection of Nuclear Material, (1980), IAEA Doc. INFCIRC/274 Rev. 1, 1456 UNTS 125, entered into force 8 February 1987 (CPPNM).

Montevideo, Uruguay, from 7 to 9 June 2017 and was attended by 20 participants from 10 member states. The second one, a workshop for countries in Africa considering launching a nuclear power programme, was held in Accra, Ghana, from 28 to 30 November 2017 and was attended by 32 participants from 11 member states.

Legislative assistance

In addition to the regular legislative assistance activities carried out by the IAEA Office of Legal Affairs, two regional workshops on nuclear law were organised for IAEA member states, one for member states of the Africa region in Vienna, Austria held from 31 July to 4 August 2017 and one for member states of the Europe region in Vienna, Austria held from 7 to 10 November 2017. These workshops addressed all aspects of nuclear law and also provided for the planning of future legislative activities in participating member states, based on an assessment of their needs.

The 7th session of the Nuclear Law Institute (NLI) was held in Baden, Austria, from 2-13 October 2017, with the aim to provide in-depth training on all aspects of nuclear law and drafting corresponding legislation. A total of 64 participants from 53 member states attended the NLI.

OECD Nuclear Energy Agency

The NEA celebrates its 60th anniversary

Nearly 200 senior leaders in the international nuclear sector from 31 countries came together in Paris in April to celebrate the 60th anniversary of the OECD Nuclear Energy Agency (NEA) and to discuss the current state and future prospects for nuclear energy. To mark the occasion, the NEA organised a special high-level session for senior leaders in the nuclear sector. "There have been many successes and accomplishments over the last 60 years. While we take this opportunity to recognise the tremendous contributions of the men and women who have served with the NEA over the decades, we are excited by the road before us, the challenges ahead and the as yet unknown priorities of tomorrow," said NEA Director-General William D. Magwood, IV during his opening remarks at the session. "The work of the NEA is always just beginning."

New NEA committee to focus on decommissioning and legacy management

The NEA Steering Committee for Nuclear Energy held its biannual meeting on 19-20 April 2018. Among the decisions taken, the committee approved the establishment of the new NEA Committee on Decommissioning of Nuclear Installations and Legacy Management (CDLM), which will enable the NEA to assist its members in managing a broader range of decommissioning issues including the management of legacy sites and legacy waste. In forming the new committee, the NEA will convene a balanced composition of policy developers and experts representing regulatory bodies and implementers in order to facilitate comprehensive exchanges of experiences and best practices in the field of nuclear decommissioning and legacy management.

New MOUs in nuclear safety and research

The World Association of Nuclear Operators (WANO) and the NEA signed a Memorandum of Understanding (MOU) to co-operate on the further development of approaches, practices and methods in order to proactively strengthen global nuclear safety in areas related to the safe operation of nuclear power plants and the human aspects of nuclear safety. It will facilitate information exchange between the stakeholders in NEA member countries and nuclear power plant operators, enhance

the common understanding of nuclear safety culture challenges and support general efforts to further enhance nuclear safety worldwide.

An MOU for Co-operative Activities has been signed between the NEA and the Electric Power Research Institute, Inc. (EPRI), recognising the value of increased collaboration between both parties. The purpose of the MOU is to deepen both parties' understanding of the global research needs in the area of nuclear energy, taking into consideration the consolidated perspectives of utilities and the industry, as well as those of regulators and government organisations. The MOU seeks to facilitate exchange between EPRI and the NEA on global research activities in various fields of nuclear energy, such as safety, radiological protection, scientific and technology developments, operational experience, economic analysis and waste management.

Third International Workshop on the Indemnification of Damage in the Event of a Nuclear Accident

On 18-20 October 2017, the NEA and the Nuclear Regulatory Authority of the Slovak Republic co-organised the Third International Workshop on the Indemnification of Damage in the Event of a Nuclear Accident. Held in Bratislava, Slovak Republic, the workshop brought together more than 170 participants from 24 NEA member countries and 8 non-member countries, representing a variety of organisations, including government agencies, regulatory authorities, operators, suppliers, nuclear insurance pools and law firms. It aimed to explore the practical application of international nuclear liability instruments and the potential consequences with regard to non-convention states in the event of a nuclear accident causing transboundary damage. Participants discussed approaches to determining the damage to be compensated, proving the causal link between the damage and the nuclear accident, identifying the liable entity, handling claims, resolving disputes and ensuring the adequate financial compensation for the victims.

Nuclear Law Committee meeting

The NEA Nuclear Law Committee (NLC) held its biannual meeting on 14-15 March 2018, bringing together 70 experts from member countries, the European Commission (EC) and the International Atomic Energy Agency (IAEA), as well as several representatives from non-member countries including Ukraine and the United Arab Emirates. Participants at the meeting discussed current activities conducted under NLC auspices on nuclear liability for transport, the legal aspects of deep geological repositories and the legal aspects of nuclear safety, as well as recent developments relating to the international legal framework for public participation in nuclear decision making.

Two working group meetings took place on the margins of the NLC meeting. On 13 March 2018, the NEA Working Party on Nuclear Liability and Transport (WPNLT) held a meeting with 32 representatives from 15 NEA member and non-member countries, the EC, the IAEA, the insurance industry and the World Nuclear Transport Institute (WNTI). In addition to adopting the working party's programme of work for 2017-2019, participants reviewed and discussed the preliminary results from a WPNLT enquiry regarding national legislation and rules applicable to nuclear transport and transit. On 16 March 2018, the NEA Working Party on the Legal Aspects of Nuclear Safety (WPLANS) held a meeting, bringing together 34 representatives from 19 NEA member and non-member countries, the EC and the IAEA. During this meeting, participating members discussed in detail the responses to a recent WPLANS survey on the long-term, continued or extended operation of nuclear power plants and/or research reactors, as well the future actions related to the survey.

2017 International School of Nuclear Law (ISNL)

The 17th session of the ISNL was held from 21 August to 1 September 2017 in Montpellier, France, bringing together a diverse group of graduate students and professionals from across the world to learn more about the legal framework and major issues affecting the peaceful uses of nuclear energy. Organised by the NEA and the University of Montpellier, the ISNL is a unique educational programme that offers participants from the academic, private and governmental sectors an in-depth look at international nuclear law, focusing on areas such as nuclear safety, environmental law, security, safeguards and nuclear liability. The 2017 session was attended by 64 participants from 40 countries, including numerous non-NEA member countries, many of whom received support to attend the ISNL from the IAEA, which also provided several lecturers. Since 2001, the ISNL has attracted nearly 1 000 participants worldwide, many of whom are now experts in the nuclear law field.

2018 International Nuclear Law Essentials (INLE) course in Asia

The seventh session of the INLE course was held from 26 February to 2 March 2018 in Singapore, in co-operation with the National University of Singapore (NUS) and its Centre for International Law. A diverse international group of 32 professionals from 15 NEA member and non-member countries participated in the programme, obtaining an overview of the international nuclear law framework, as well as other major issues affecting the peaceful uses of nuclear energy. Instructors from the NEA, the IAEA, NUS, nuclear regulatory authorities and the private sector gave lectures on topics related to nuclear safety, security, non-proliferation and liability. The course programme also featured regional keynote lecturers from representatives of the China Nuclear Power Engineering Company, Ltd. and the National University of Malaysia, who presented their respective perspectives on nuclear law in China and Malaysia.

NEA publications of interest

Since the publication of *Nuclear Law Bulletin* No. 99, the NEA has issued a number of publications of interest. *Nuclear Energy Data* is the NEA's annual compilation of statistics and country reports documenting nuclear power status in NEA member countries and in the OECD area. Information provided by governments includes statistics on total electricity produced by all sources and by nuclear power, fuel cycle capacities and requirements, and projections to 2035, where available. Country reports summarise energy policies, updates of the status in nuclear energy programmes and fuel cycle developments. This update includes details about new units connected to the grid in 2016 in Korea, Russia and the United States; reactors returned to operation in Japan; reactors shut down in Japan, Russia and the US; and the preparation of new build projects making progress in Finland, Hungary, Turkey and the United Kingdom. These and other developments are provided in the publication's numerous tables, graphs and country reports.

Another report, *Towards an All-Hazards Approach to Emergency Preparedness and Response: Lessons Learnt from Non-Nuclear Events*, considers experiences from the emergency management of hazards emanating from a variety of sectors in order to achieve an all-hazards approach to emergency management – a major step in the process. The NEA joined forces with the OECD Environment and Public Governance and Territorial Development Directorates, as well as the European Commission's Joint Research Centre (JRC) to collaborate on this report, which confirms similarities in emergency preparedness and response across sectors, identifies lessons learnt and good practices for the benefit of the international community and demonstrates the value of an all-hazards approach.

Finally, the *NEA Workshop on Stakeholder Involvement in Nuclear Decision Making: Summary Report* has been issued. Held in January 2017, the Workshop on Stakeholder Involvement in Nuclear Decision Making brought together experts with first-hand knowledge and experience in areas related to nuclear law, regulatory practices, radiological protection, nuclear waste management, the deployment of new nuclear facilities, extended operation of nuclear facilities, deployment of other energy technologies and infrastructures, and social and traditional media. This summary report attempts to capture the collective wisdom generated over three days of interaction. It highlights some commonalities and differences in views and approaches, and identifies particular lessons that can be applied to improve the strategy and practice of involving stakeholders in decision making. Overall, the learning gained from this workshop can benefit governments and citizens alike.

All three reports are available free online at: www.oecd-nea.org/pub/.

The Nuclear Safety Law of the People's Republic of China[1]

(Adopted on 1 September 2017 at the Twenty-ninth Session of the Standing Committee of the Twelfth National People's Congress)

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Chapter 1 General Provisions

ARTICLE 1 This law is formulated to ensure nuclear safety, prevent and respond to nuclear accidents, safely use nuclear energy, protect the safety and health of the public and personnel in the industry, protect the ecology and environment, and promote sustainable socio-economic development.

ARTICLE 2 This law applies to activities within the territories and other maritime areas under the jurisdiction of the People's Republic of China concerning the adoption of preventive, protective, mitigating, regulatory, and other safety measures for nuclear facilities, nuclear material, and related radioactive waste; the prevention of nuclear accidents caused by technical factors, human factors, or natural disasters; and the reduction of the radiological consequences of nuclear accidents to the best extent possible.

"Nuclear facility" means:

1. nuclear power plants, nuclear plants generating heat and power, nuclear plants generating steam and heat, and other nuclear power plants and installations;
2. reactors other than nuclear power plants, such as research reactors, experimental reactors, and critical assemblies;
3. nuclear fuel cycle facilities that produce, process, store and reprocess nuclear fuel; and
4. facilities that treat, store and dispose of radioactive waste.

"Nuclear material" means:

1. uranium-235 and products thereof;

1. This document is an unofficial English translation of the original Chinese text.

2. uranium-233 and products thereof;
3. plutonium-239 and products thereof; and
4. other nuclear material that is subject to control in accordance with laws and administrative regulations.

"Radioactive waste" means waste that is produced during the operation or decommissioning of a nuclear facility, contains or is contaminated with radionuclides at concentrations or specific activities greater than clearance levels established by the State, and is not foreseen to have a future use.

ARTICLE 3 The State persistently follows a rational, co-ordinated and balanced approach to nuclear safety, enhances the country's capacity for nuclear safety, and ensures the healthy development of the nuclear sector.

ARTICLE 4 Engagement in the nuclear sector must abide by the guiding principle of ensuring safety.

Nuclear safety work must be aligned with the principles of safety first; prevention is key; well-defined responsibilities; strict management; defence-in depth; independent regulation; and comprehensive protection.

ARTICLE 5 The operator of a nuclear facility assumes overall responsibility for nuclear safety.

The suppliers of equipment, engineering, and services to the operator of a nuclear facility shall assume their respective responsibilities.

ARTICLE 6 The nuclear safety regulatory authority under the State Council is responsible for the regulation of nuclear safety.

The competent authority of the nuclear industry, the competent authority for energy, and other relevant authorities under the State Council are responsible for the administration of nuclear safety work within the scope of their respective duties.

The State establishes a mechanism for co-ordinating nuclear safety work and co-ordinates relevant departments under an overall plan to advance work in this area.

ARTICLE 7 The nuclear safety regulatory authority under the State Council works with relevant authorities under the State Council to develop a national nuclear safety plan, submits said plan to the State Council, and implements said plan upon authorisation.

ARTICLE 8 The State shall establish a system of nuclear safety standards at highest and strictest levels.

The relevant authorities under the State Council shall formulate nuclear safety standards in their respective scope of responsibilities. Nuclear safety standards are enforceable standards.

Nuclear safety standards shall be modified in accordance with the development of the economy and society and the advancement of science and technology.

ARTICLE 9 The State formulates a nuclear safety policy and strengthens a nuclear safety culture.

The nuclear safety regulatory authority, the competent authority of the nuclear industry, and the competent authority for energy under the State Council shall establish a mechanism to foster a nuclear safety culture.

The operator of a nuclear facility and its suppliers of equipment, engineering, and services shall actively foster and build a nuclear safety culture that is integrated into every aspect of production, operation, research, and management.

ARTICLE 10 The State encourages and supports the research, development, and utilisation of science and technology related to nuclear safety, strengthens the protection of intellectual property rights, and attaches importance to the cultivation of skilled nuclear safety personnel.

The research plans of relevant authorities under the State Council shall include special projects that study key technologies relevant to the safety of nuclear facilities and material and the monitoring and evaluation of radiation environments; said plans shall promote advanced and reliable technologies for nuclear safety.

The operator of a nuclear facility, its suppliers of equipment, engineering, and services, and scientific research institutions involved in nuclear safety shall continue to develop advanced and reliable technologies for nuclear safety and fully utilise advances in science and technology to increase the level of nuclear safety.

The State Council and the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government shall follow pertinent regulations to grant honours and awards to entities and individuals who have made significant contributions to the innovation of science and technology.

ARTICLE 11 No entity or individual shall compromise the safety of nuclear facilities and nuclear material.

Members of the public, legal persons, and other organisations are entitled to access information about nuclear safety in accordance with the law, and to receive compensation should they suffer nuclear damage.

ARTICLE 12 The State strengthens the security of nuclear facilities and nuclear material.

The operator of a nuclear facility shall establish and perfect security regimes and adopt security measures to prevent the nuclear facility and nuclear material from destruction, damage, and theft.

ARTICLE 13 The State organises international exchanges and co-operation on the subject of nuclear safety, improves mechanisms for international co-operation on nuclear safety, prevents and responds to the threat of nuclear terrorism, and fulfils obligations that have been specified in international conventions entered into or acceded to by the People's Republic of China.

Chapter 2 The Safety of Nuclear Facilities

ARTICLE 14 The State carries out overall planning, scientific demonstrations and reasonable arrangement for the siting and construction of nuclear facilities.

The State takes a category-based approach to the regulation of nuclear facilities, which considers each facility's nature, risk profile, and other factors.

ARTICLE 15 The operator of a nuclear facility shall be capable of ensuring the safe operation of the nuclear facility and shall:

1. have an organisation and management system as well as regimes for quality assurance, safety management, and job responsibility that meet nuclear safety requirements;
2. employ required numbers of qualified technical specialists and management personnel;

3. be capable of conducting safety assessments, allocating resources, and managing finances as required to ensure the safety of the nuclear facility;
4. be capable of supporting and continuing to improve necessary nuclear safety technology;
5. be capable of emergency response and have the financial security to provide compensation for nuclear damage; and
6. be capable of meeting other conditions required by laws and administrative regulations.

ARTICLE 16 The operator of a nuclear facility shall comply with the requirements of laws, administrative regulations, and standards; set up a defence-in-depth system; and effectively protect against threats caused by technical factors, human factors, or natural disasters in order to ensure the safety of the nuclear facility.

The operator of a nuclear facility shall conduct safety assessments of the nuclear facility periodically and submit to reviews by the nuclear safety regulatory authority under the State Council.

ARTICLE 17 The operator of a nuclear facility and its suppliers of equipment, engineering, and services shall establish and implement quality assurance systems; effectively guarantee the quality of the equipment, engineering, and services; and ensure that the performance of the equipment meets the requirements in nuclear safety standards and that the engineering, services, etc. meet the relevant requirements for nuclear safety.

ARTICLE 18 The operator of a nuclear facility shall strictly control exposure to radiation in order to ensure that personnel are not exposed to radiation doses that exceed dose limits prescribed by the State and radiation exposure is kept as low as reasonably achievable.

ARTICLE 19 The operator of a nuclear facility shall monitor the type and concentration of radionuclides in the surrounding environment of the nuclear facility and the total amount of radionuclides in the effluents discharged by the nuclear facility, and shall periodically report the monitoring results to the competent authorities for environmental protection under the State Council and under the people's government in the province, autonomous region, and municipality directly under the Central Government where said nuclear facility is located.

ARTICLE 20 The operator of a nuclear facility shall develop training plans to educate personnel in the industry about nuclear safety, teach them skills, and assess their performance in accordance with national regulations.

The operator of a nuclear facility shall ensure the safety and health of personnel in the industry by providing protective gear and equipment and conducting occupational health checks.

ARTICLE 21 The people's governments in provinces, autonomous regions, and municipalities directly under the Central Government shall protect sites where the State plans to build important nuclear facilities, such as nuclear power plants, and shall not convert the sites to other uses within the planned period.

The people's governments in provinces, autonomous regions, and municipalities directly under the Central Government shall demarcate restricted areas around important nuclear facilities, such as nuclear power plants; said demarcation shall be implemented upon the agreement of the nuclear safety regulatory authority under the State Council.

The building of facilities that produce or store flammable, explosive, or corrosive substances that may threaten the safety of nuclear facilities in planned restricted areas is prohibited; the building of structures that house large numbers of people in the planned restricted areas is also prohibited.

ARTICLE 22 The State establishes a safety licensing regime for nuclear facilities.

The operator of a nuclear facility shall apply to the nuclear safety regulatory authority under the State Council for a licence before engaging in the siting, construction, operation, decommissioning, or other activities of the nuclear facility.

The operator of a nuclear facility shall submit a request to the nuclear safety regulatory authority under the State Council for authorisation if the operator requests that any of the terms specified in the licence be modified.

ARTICLE 23 The operator of a nuclear facility shall scientifically evaluate possible sites for the nuclear facility based on the geology, seismic hazards, climate, hydrology, environment, and population distribution. On the precondition that technical evaluation requirements for nuclear safety are met, the operator shall submit a safety analysis report on the siting of the nuclear facility to the nuclear safety regulatory authority under the State Council. If a review of the report determines that nuclear safety requirements have been met, a written opinion on the review on the siting of the nuclear facility will be issued.

ARTICLE 24 The design of a nuclear facility shall conform to nuclear safety standards; incorporate scientific parameters and technical requirements into structures, systems, and equipment; provide diverse protections and multiple barriers; ensure reliable, stable, and easily manageable operation of the nuclear facility; and meet nuclear safety requirements.

ARTICLE 25 Prior to the construction of a nuclear facility, the operator of said nuclear facility shall submit a construction application with the nuclear safety regulatory authority under the State Council and submit:

1. a nuclear facility construction application;
2. a preliminary safety analysis report;
3. environmental impact assessment documentation;
4. quality assurance documentation; and
5. other materials specified in laws and administrative regulations.

ARTICLE 26 Upon obtaining a nuclear facility construction licence, the operator of the nuclear facility shall ensure that the overall performance of the nuclear facility meets the requirements of nuclear safety standards.

A nuclear facility construction licence shall be valid for no more than ten years. If, upon expiration of the licence, an extension is needed for the construction, a review and authorisation shall be sought from the nuclear safety regulatory authority under the State Council. Exceptions will be granted to those that meet one of the following criteria and have been determined to present no safety risk upon evaluation:

1. the construction of the nuclear facility is delayed due to national policies or actions;
2. the nuclear facility is used for scientific research;
3. the nuclear facility is used for engineering demonstrations; and
4. the nuclear facility is used for spent fuel reprocessing.

After construction of the nuclear facility has been completed, commissioning shall be conducted to verify whether it meets the nuclear safety requirements as designed.

ARTICLE 27 Prior to the first loading of fuel at a nuclear facility, the operator of the nuclear facility shall file an operating application with the nuclear safety regulatory authority under the State Council and submit:

1. a nuclear facility operating application;
2. a final safety analysis report;
3. quality assurance documentation;
4. an emergency plan; and
5. other materials specified in laws and administrative regulations.

Upon obtaining a nuclear facility operating licence, the operator of the nuclear facility shall operate in accordance with the operating licence.

The nuclear facility operating licence shall be valid for the design lifetime of the nuclear facility. While the operating licence is valid, the nuclear safety regulatory authority under the State Council may make reasonable adjustments to items specified in the operating licence in accordance with the requirements of laws, administrative regulations, and new nuclear safety standards.

The operator of a nuclear facility shall seek authorisation from the nuclear safety regulatory authority under the State Council for adjustments to the following items:

1. important structures, systems, and equipment that served as the basis for issuing the operating licence;
2. operational limits and conditions; or
3. procedures and other documentation related to nuclear safety that have been authorised by the nuclear safety regulatory authority under the State Council.

ARTICLE 28 The operator of a nuclear facility that is expected to operate past the expiration date of its operating licence shall apply to the nuclear safety regulatory authority under the State Council for an extension of five years prior to said expiration date, and shall demonstrate and verify whether said nuclear facility conforms to nuclear safety standards. Only nuclear facilities that have been authorised upon review may continue to operate.

ARTICLE 29 Once a nuclear facility stops operating, the operator of the nuclear facility shall conduct shutdown management in a safe manner, maintain safety during the shutdown period, and ensure the basic functions, technical personnel, and documentation required for decommissioning.

ARTICLE 30 Prior to the decommissioning of a nuclear facility, the operator of said nuclear facility shall file a decommissioning application with the nuclear safety regulatory authority under the State Council and submit:

1. a nuclear facility decommissioning application;
2. a safety analysis report;
3. environmental impact assessment documentation;
4. quality assurance documentation; and
5. other materials specified in laws and administrative regulations.

When a nuclear facility is being decommissioned, the operator of the nuclear facility shall treat and dispose of on-site radioactive substances in accordance with the principle of "as low as reasonably achievable," and shall reduce the level of radioactivity in structures, systems, and equipment to meet the requirements of standards.

After a nuclear facility is decommissioned, the competent authority for environmental protection under the people's government in the province, autonomous region, or municipality directly under the Central Government where the nuclear facility is located shall organise the monitoring of the types and concentrations of radionuclides present at the site of said nuclear facility and in the surrounding environment.

ARTICLE 31 The import of a nuclear facility shall meet the requirements of the People's Republic of China's laws, administrative regulations, and standards governing nuclear safety, and shall be subject to the review and authorisation of the nuclear safety regulatory authority under the State Council.

The export of a nuclear facility shall conform to the export control provisions of the People's Republic of China governing nuclear facilities.

ARTICLE 32 The nuclear safety regulatory authority under the State Council shall organise safety technical reviews of applications for nuclear facility safety licences in accordance with statutory conditions and procedures; said authority shall issue a decision granting the licence to nuclear facilities that meet nuclear safety requirements in accordance with the law within twenty days of completing the technical review.

During the licensing processes for nuclear facility construction and operation, the nuclear safety regulatory authority under the State Council shall consult relevant authorities under the State Council and the people's government in the province, autonomous region, or municipality directly under the Central Government where the nuclear facility is located. Said authorities and people's government being consulted shall provide a reply within three months.

ARTICLE 33 In the process of organising safety technical reviews, the nuclear safety regulatory authority under the State Council shall entrust the technical review to technical support entities that do not have a conflict of interest with the entity applying for a licence. Said entrusted technical support entities shall be responsible for the authenticity and accuracy of the conclusions of their technical evaluations.

ARTICLE 34 The nuclear safety regulatory authority under the State Council shall establish a committee of nuclear safety experts to provide advice for decision-making related to nuclear safety.

The committee of nuclear safety experts shall be consulted when formulating nuclear safety plans and standards and making technical decisions on major safety issues related to nuclear facilities.

ARTICLE 35 The State establishes a nuclear safety reporting regime for operators of nuclear facilities; detailed measures are formulated by the relevant authorities under the State Council.

The relevant authorities under the State Council shall establish a nuclear safety experience feedback regime, respond to reported information about nuclear safety in a timely manner, and share information.

The operator of a nuclear facility shall establish a nuclear safety experience feedback system.

ARTICLE 36 Entities that provide nuclear facilities with design, manufacturing, installation, and non-destructive testing services for nuclear safety equipment shall apply to the nuclear safety regulatory authority under the State Council for a licence. Overseas organisations that provide domestic nuclear facilities with design, manufacturing, installation, and non-destructive testing services for nuclear safety equipment shall register with the nuclear safety regulatory authority under the State Council.

The nuclear safety regulatory authority under the State Council conducts safety inspections on imported nuclear safety equipment in accordance with the law.

ARTICLE 37 The operating personnel of a nuclear facility and specialised technicians, such as welders and non-destructive testers, who work with nuclear safety equipment, shall obtain qualifications as required by the State.

The operator of a nuclear facility and entities that provide manufacturing, installation, or non-destructive testing services for nuclear safety equipment shall hire personnel who have obtained appropriate qualifications to perform specialised technical work that concerns the safety of the nuclear facility.

Chapter 3 The Safety of Nuclear Material and Radioactive Waste

ARTICLE 38 The operator of a nuclear facility and other relevant entities shall obtain licences in accordance with required conditions to possess nuclear material; they shall prevent the theft, damage, loss, unlawful transfer, and unlawful use of nuclear material and ensure the safety and lawful use of nuclear material by adopting the following measures:

1. establishing an organisation or assigning personnel to be the designated custodian(s) of nuclear material;
2. establishing a nuclear material accounting regime to maintain consistency in nuclear material inventories;
3. establishing a physical protection system that is consistent with the level of protection needed for the nuclear material;
4. establishing a regime to safeguard confidential information and adopting measures to maintain confidentiality; and
5. other measures specified in laws and administrative regulations.

ARTICLE 39 Parties that produce, store, transport, and reprocess spent fuel shall take measures to ensure the safety of spent fuel, and shall assume responsibility for the nuclear safety of spent fuel in their possession.

ARTICLE 40 The disposal of radioactive waste shall be category-based.

Low and intermediate level radioactive waste undergoes near-surface or intermediate-depth disposal at locations specified by the State in compliance with nuclear safety standards.

High level radioactive waste undergoes centralised deep geological disposal, which is handled exclusively by entities designated by the State Council.

ARTICLE 41 Nuclear facility operators and entities that treat and dispose of radioactive waste shall minimise and neutralise radioactive waste in the treatment and disposal processes in order to ensure permanent safety.

ARTICLE 42 The competent authority of the nuclear industry under the State Council works with other relevant authorities under the State Council and with the people's governments in provinces, autonomous regions, and municipalities directly

under the Central Government to develop siting plans for low and intermediate level radioactive waste disposal, and organises the implementation of said plans upon their authorisation by the State Council.

The competent authority of the nuclear industry under the State Council works with other relevant authorities under the State Council to develop siting plans for high level radioactive waste disposal, and organises the implementation of said plans upon their authorisation by the State Council.

The construction of radioactive waste disposal sites shall meet the requirements for the development of nuclear energy.

ARTICLE 43 The State shall establish a licensing regime for radioactive waste management.

Entities that specialise in the treatment, storage, and disposal of radioactive waste shall apply to the nuclear safety regulatory authority under the State Council for a licence.

The operator of a nuclear facility that uses the nuclear facility's own supporting treatment and storage facilities for the treatment and storage of radioactive waste generated by said nuclear facility does not need to apply for a licence.

ARTICLE 44 The operator of a nuclear facility shall treat the solid radioactive waste that it generates and the liquid radioactive waste that it cannot clean and discharge, convert them into stable and standardised solid waste, and then promptly deliver said stable and standardised solid waste to a radioactive waste disposal entity for disposal.

The operator of a nuclear facility shall treat the gaseous radioactive waste that it generates and discharge the treated waste only after the national standards for the prevention and control of radioactive pollution have been met.

ARTICLE 45 Radioactive waste disposal entities shall dispose of radioactive waste that they receive in accordance with the national standards for the prevention and control of radioactive pollution.

Radioactive waste disposal entities shall establish a record archive to document radioactive waste disposals, and shall faithfully record information related to their disposal activities, including the source, quantity, characteristics, and storage location of the radioactive waste. The record archive shall be retained permanently.

ARTICLE 46 The State shall establish a closure regime for radioactive waste disposal facilities.

A radioactive waste disposal facility shall follow closure procedures in accordance with the law and set up permanent signs in demarcated areas if said facility meets any of the following criteria:

1. the design life for service has expired;
2. the design capacity for radioactive waste disposal has been reached;
3. conditions in the area, including the geological structure and hydrogeology, have significantly changed so as to render it inappropriate to continue radioactive waste disposal; and
4. laws and administrative regulations otherwise require the facility to close.

ARTICLE 47 Prior to the closure of a radioactive waste disposal facility, the radioactive waste disposal entity shall develop a safety management plan for the closure and submit it to the nuclear safety regulatory authority under the State Council for authorisation.

The safety management plan shall include:

1. personnel responsible for safety management and their duties;
2. costs for safety management;
3. measures for safety management; and
4. a timeframe for safety management.

After the closure of a radioactive waste disposal facility, the safety management of said facility shall be conducted by the radioactive waste disposal entity in accordance with the authorised safety management plan; upon the authorisation of the nuclear safety regulatory authority under the State Council working with other relevant authorities under the State Council, the administration of the management will be handed over to the people's government in the province, autonomous region, or municipality directly under the Central Government.

ARTICLE 48 The operator of a nuclear facility shall pay for the treatment and disposal of spent fuel as required by the State, and said cost shall be included in production costs.

The operator of a nuclear facility shall accrue the expenses of decommissioning the nuclear facility and disposing of radioactive waste; said expenses shall be included in the investment budgetary estimate and production costs, and shall be specifically used for decommissioning said nuclear facility and disposing of radioactive waste. Specific measures are formulated by the finance authority and the competent pricing authority under the State Council in collaboration with the nuclear safety regulatory authority, the competent authority of the nuclear industry, and the competent authority for energy under the State Council.

ARTICLE 49 The State takes a category-based approach to the regulation of the transport of nuclear material and radioactive waste and adopts effective measures to ensure the safety of transport.

ARTICLE 50 The State safeguards the transport of nuclear material and radioactive waste by road, rail, and water; the relevant authorities under the State Council shall strengthen the administration of transport by road, rail, and water, and shall formulate specific safeguard measures.

ARTICLE 51 The competent authority of the nuclear industry under the State Council is responsible for co-ordinating the administration of the transport of spent fuel, and oversees relevant confidentiality measures.

The public security authority supervises the physical protection of nuclear material and radioactive waste that are transported by road, and acts in accordance with the law to handle accidents that may jeopardise the safe transport of nuclear material and radioactive waste. The transport of nuclear material and radioactive waste by road shall be reported for authorisation to the public security authorities of the people's governments at the county level and above that govern the area where the shipment originates in accordance with the authority's competence; the transport of spent fuel or high level radioactive waste shall be reported to the public security authority under the State Council for authorisation.

The nuclear safety regulatory authority under the State Council is responsible for authorising licence applications for containers that are used to transport nuclear material and radioactive waste.

ARTICLE 52 The consignor of nuclear material and radioactive waste shall take effective measures for radiological protection and security during transport, and shall be responsible for nuclear safety during transport.

The consignor of spent fuel and high level radioactive waste shall submit relevant nuclear safety analysis reports to the nuclear safety regulatory authority under the State Council, and shall begin transport activities only after undergoing a review and receiving authorisation.

The carrier of nuclear material and radioactive waste shall obtain transport qualifications as required by the State in accordance with the law.

ARTICLE 53 For aspects not specified in this law concerning the transport of nuclear material and radioactive waste by road, rail, and water, the relevant laws, administrative regulations, and rules that govern the transport of radioactive items and dangerous goods apply.

Chapter 4 Emergency Response to Nuclear Accidents

ARTICLE 54 The State has established the National Nuclear Accident Emergency Coordination Committee to organise and co-ordinate the emergency management of nuclear accidents nationwide.

The people's governments in provinces, autonomous regions, and municipalities directly under the Central Government establish Nuclear Accident Emergency Coordination Committees based on their actual needs to organise and co-ordinate the emergency management of nuclear accidents in their respective administrative areas.

ARTICLE 55 The competent authority of the nuclear industry under the State Council shall assume the day-to-day work of the National Nuclear Accident Emergency Coordination Committee, take the lead in formulating a national emergency plan for nuclear accidents, and organise the implementation of said plan upon its authorisation by the State Council. In accordance with the deployment specified in the national emergency plan for nuclear accidents, member entities of the National Nuclear Accident Emergency Coordination Committee formulate their own emergency plans for nuclear accidents, and file said plans with the competent authority of the nuclear industry under the State Council.

Authorities designated by the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government assume the day-to-day work of the Nuclear Accident Emergency Coordination Committee; are responsible for formulating emergency plans for nuclear accidents that occur off-site within their respective administrative areas; and organise the implementation of said plans upon their review and authorisation by the National Nuclear Accident Emergency Coordination Committee.

The operator of a nuclear facility is responsible for formulating an emergency plan for on-site nuclear accidents; said plan is filed with the competent authority of the nuclear industry and the competent authority for energy under the State Council, and with the authorities designated by the people's government in the province, autonomous region, or municipality directly under the Central Government.

In accordance with the requirements of the State Council and the Central Military Commission, the Chinese People's Liberation Army and the Chinese People's Armed Police Force formulate emergency work plans for nuclear accidents that occur in localities supported by their respective systems, and file said plans with the competent authority of the nuclear industry under the State Council.

The entity that formulates an emergency plan shall revise said plan in a timely manner according to actual needs and changing circumstances.

ARTICLE 56 The operator of a nuclear facility shall furnish the facility with emergency equipment and conduct training and drills for emergency workers in accordance with the emergency plan in order to be prepared for emergencies.

The authorities designated by the people's government in the province, autonomous region, or municipality directly under the Central Government where the nuclear facility is located shall raise public awareness about emergency response to nuclear accidents, and shall organise relevant businesses, institutions, and communities to participate in emergency drills for nuclear accidents in accordance with the emergency plan.

ARTICLE 57 The State establishes a reserve fund regime for emergency response to nuclear accidents in order to ensure sufficient funds for nuclear accident emergency work. The administrative rules of said nuclear accident emergency reserve fund are formulated by the State Council.

ARTICLE 58 The State takes a graded approach to the regulation of emergency response to nuclear accidents.

In the event of a nuclear accident, the operator of a nuclear facility shall respond to emergencies and mitigate the consequences of the nuclear accident in accordance with the requirements of the emergency plan; immediately report the condition of said nuclear facility to the competent authority of the nuclear industry and the nuclear safety regulatory authority under the State Council, and to the authorities designated by the people's government in the province, autonomous region, or municipality directly under the Central Government; and recommend off-site emergency response actions as needed.

ARTICLE 59 The National Nuclear Accident Emergency Coordination Committee organises and co-ordinates the relevant authorities under the State Council, local people's governments, and the operators of nuclear facilities to carry out emergency rescue operations in the event of nuclear accidents in accordance with the deployment in the national emergency plan for nuclear accidents.

As required by the State Council and the Central Military Commission, the Chinese People's Liberation Army and the Chinese People's Armed Police Force carry out emergency rescue operations in the event of nuclear accidents.

The operator of a nuclear facility shall carry out work in support of emergency response in accordance with the requirements of emergency rescue operations in the event of nuclear accidents.

ARTICLE 60 The competent authority of the nuclear industry under the State Council or the authorities designated by the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government are responsible for releasing information about emergency response to nuclear accidents.

The National Nuclear Accident Emergency Coordination Committee co-ordinates international notification and international rescue operations for emergency response to nuclear accidents under an overall plan.

ARTICLE 61 All levels of people's governments, their relevant authorities, operators of nuclear facilities, and others shall organise post-nuclear-accident work, such as recovery operations and loss assessments, in accordance with the relevant requirements and authorisations of the State Council.

The State Council or its authorised authority is responsible for carrying out investigations of nuclear accidents.

The State Council or its designated agency is responsible for carrying out investigations of emergency actions for off-site nuclear accidents.

ARTICLE 62 Emergencies related to the transport of nuclear material and radioactive waste shall be incorporated into the emergency plans for off-site nuclear accidents or the emergency plans for radiation in the provinces, autonomous regions, and municipalities directly under the Central Government on the transport routes of said material and waste. The people's governments in provinces, autonomous regions, and municipalities directly under the Central Government are responsible for emergency response to nuclear accidents that occur within their administrative areas.

Chapter 5 Information Disclosure and Public Participation

ARTICLE 63 The relevant authorities under the State Council and the authorities designated by the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government where the nuclear facilities are located shall disclose information related to nuclear safety within the scope of their respective duties in accordance with the law.

The nuclear safety regulatory authority under the State Council shall, in accordance with the law, disclose information about administrative licences related to nuclear safety and other information, such as supervision and inspection reports on activities related to nuclear safety, overall safety status, environmental quality as measured by radiation levels, and nuclear accidents.

The State Council shall report the nuclear safety situation to the Standing Committee of the National People's Congress periodically.

ARTICLE 64 The operator of a nuclear facility shall disclose information such as its nuclear safety regime and related documentation, nuclear facility safety status, radiation monitoring data on discharged effluents and the surrounding environment, and annual nuclear safety reports. Specific measures are formulated by the nuclear safety regulatory authority under the State Council.

ARTICLE 65 Nuclear safety information disclosed in accordance with the law shall be made available to the public in a timely manner through government announcements, websites, and other channels that are easily accessible to the public.

Members of the public, legal persons, and other organisations may apply to the nuclear safety regulatory authority under the State Council and the authorities designated by the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government where nuclear facilities are located in order to obtain information related to nuclear safety in accordance with the law.

ARTICLE 66 The operator of a nuclear facility shall consult stakeholders on major nuclear safety matters involving the public interest through questionnaires, hearings, discussions, symposiums, or other formats, and shall provide feedback in appropriate formats.

The people's governments in provinces, autonomous regions, and municipalities directly under the Central Government where nuclear facilities are located shall consult stakeholders on major nuclear safety matters affecting the public interest through hearings, discussions, symposiums, or other formats, and shall provide feedback in appropriate formats.

ARTICLE 67 The operator of a nuclear facility shall adopt the following measures to conduct nuclear safety awareness activities:

1. opening the nuclear facility to the public in an orderly manner on the precondition of ensuring the safety of the nuclear facility;
2. co-operating with schools to educate students about nuclear safety;
3. developing venues to publicise nuclear safety, and printing and disseminating publicity materials about nuclear safety; and
4. other measures specified in laws and administrative regulations.

ARTICLE 68 Members of the public, legal persons, and other organisations are entitled to notify the nuclear safety regulatory authority and other relevant authorities under the State Council about the existence of potential nuclear safety hazards or violations of laws and administrative regulations on nuclear safety.

Members of the public, legal persons, and other organisations shall not fabricate or disseminate false information about nuclear safety.

ARTICLE 69 The disclosure of government information that relates to state secrets, trade secrets, and personal information is conducted in accordance with relevant requirements of the State.

Chapter 6 Supervision and Inspection

ARTICLE 70 The State establishes a supervision and inspection regime for nuclear safety.

The nuclear safety regulatory authority and other relevant authorities under the State Council shall supervise and inspect entities engaged in nuclear safety activities to determine their compliance with laws, administrative regulations, rules, and standards that govern nuclear safety.

The nuclear safety regulatory authority under the State Council may establish agencies in geographical areas where nuclear facilities are concentrated. The nuclear safety regulatory authority under the State Council or its agencies shall dispatch supervision and inspection personnel to sites where nuclear facilities are under construction, in operation, being decommissioned, or engaging in other activities to supervise and inspect nuclear safety.

ARTICLE 71 The nuclear safety regulatory authority and other relevant authorities under the State Council shall strengthen their capacity to regulate nuclear safety and raise regulatory standards for nuclear safety.

The nuclear safety regulatory authority under the State Council shall organise the research and development of regulatory technology for nuclear safety, and shall maintain the ability to conduct technical evaluations that are compatible with nuclear safety regulation.

ARTICLE 72 The nuclear safety regulatory authority and other relevant authorities under the State Council have the authority to take the following measures when conducting supervisory work and inspections on nuclear safety:

1. entering a site to conduct monitoring, inspections, or verifications;
2. accessing relevant documentation, materials, and records;
3. accessing relevant personnel in the course of investigating and gathering information; and
4. demanding corrective actions at the site for issues discovered.

The nuclear safety regulatory authority and other relevant authorities under the State Council shall form reports based on their supervisory work and inspections, and shall establish an archive.

ARTICLE 73 Entities that engage in nuclear safety activities shall offer their co-operation, make truthful explanations, and provide necessary materials to the nuclear safety regulatory authority and other relevant authorities under the State Council in the course of their supervisory work and inspections conducted in accordance with the law; said entities shall not refuse or obstruct the supervisory work or inspections.

ARTICLE 74 Nuclear safety supervision and inspection personnel shall be devoted to their duty, diligent and conscientious about their work, and impartial when enforcing the law.

Nuclear safety supervision and inspection personnel shall possess the necessary expertise and professional capabilities to conduct supervisory work and inspections, and shall receive training periodically.

Nuclear safety supervision and inspection personnel shall produce valid qualifications in the course of their supervisory work and inspections, and shall maintain the confidentiality of state secrets, trade secrets, and personal information that becomes known to them in accordance with the law.

Chapter 7 Legal Liability

ARTICLE 75 If any of the following violations of this law occur, disciplinary action will be taken against the directly responsible supervisor and other directly responsible personnel in accordance with the law:

1. the nuclear safety regulatory authority or other relevant authorities under the State Council fail to review and authorise licence applications in accordance with the law;
2. the relevant authorities under the State Council or the authorities designated by the people's government in the province, autonomous region, or municipality directly under the Central Government where the nuclear facility is located fail to disclose relevant information about nuclear safety in accordance with the law;
3. the people's government in the province, autonomous region, or municipality directly under the Central Government where the nuclear facility is located fails to consult stakeholders on major nuclear safety matters affecting the public interest;
4. the nuclear safety regulatory authority or other relevant authorities under the State Council fail to form reports based on their supervisory work and inspections, or fail to establish an archive;
5. nuclear safety supervision and inspection personnel fail to produce valid qualifications in the course of their supervisory work and inspections, or fail to maintain the confidentiality of state secrets, trade secrets, and personal information that becomes known to them in accordance with the law; and
6. the nuclear safety regulatory authority or other relevant authorities under the State Council and relevant authorities of the people's governments in provinces, autonomous regions, and municipalities directly under the Central Government act in other ways that abuse their authority, neglect their duties, seek personal gain, or engage in fraud.

ARTICLE 76 Those whose actions constitute a violation of this law and of public security administration, such as threatening the safety of nuclear facilities and nuclear material or fabricating and disseminating false information about nuclear safety, will be subject to public security penalties by the public security authority in accordance with the law.

ARTICLE 77 If any of the following violations of this law occur, corrective measures will be ordered and a warning will be issued by the nuclear safety regulatory authority or other relevant authorities under the State Council; in serious cases, a fine of not less than 200 000 yuan nor more than 1 000 000 yuan will be imposed; those who refuse to take corrective measures will be ordered to halt construction or suspend operations for rectification:

1. the operator of a nuclear facility fails to set up a defence-in-depth system for the nuclear facility;
2. the operator of a nuclear facility or its suppliers of equipment, engineering, and services fail to establish or implement a quality assurance system;
3. the operator of a nuclear facility fails to control exposure to radiation at doses that meet requirements;
4. the operator of a nuclear facility fails to establish a nuclear safety experience feedback system; and
5. the operator of a nuclear facility fails to consult stakeholders on major nuclear safety matters affecting the public interest.

ARTICLE 78 If, in violation of this law, facilities that produce or store flammable, explosive, and corrosive substances that may threaten the safety of nuclear facilities are built in planned restricted areas, or structures that house large numbers of people are built in planned restricted areas, the dismantling of said facilities and structures and the restoration of said areas to their original state within a specified timeframe will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed.

ARTICLE 79 If any of the following violations of this law by the operator of a nuclear facility occur, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 1 000 000 yuan nor more than 5 000 000 yuan will be imposed; those who refuse to take corrective measures will be ordered to halt construction or suspend operations for rectification; those who have received illegal proceeds will have said proceeds forfeited; those who have polluted the environment will be ordered to implement pollution abatement measures to eliminate the pollution within a specified timeframe, and those who fail to implement the measures within the specified timeframe will be assigned a capable entity to implement the measures on their behalf and will be required to cover all costs; a fine of not less than 50 000 yuan nor more than 200 000 yuan will be imposed on the directly responsible supervisor and other directly responsible personnel:

1. engaging in the construction, operation, or decommissioning of a nuclear facility without a licence;
2. modifying terms specified in the licence documentation without obtaining the required licence for doing so;
3. continuing to operate a nuclear facility after the expiration date of said facility's operating licence without undergoing a review and receiving authorisation; and

4. importing a nuclear facility without a review and authorisation.

ARTICLE 80 If any of the following violations of this law by the operator of a nuclear facility occur, corrective measures will be ordered and a warning will be issued by the nuclear safety regulatory authority under the State Council; in serious cases, a fine of not less than 500 000 yuan nor more than 2 000 000 yuan will be imposed; those who have polluted the environment will be ordered to implement pollution abatement measures to eliminate the pollution within a specified timeframe, and those who fail to implement the measures within the specified timeframe will be assigned a capable entity to implement the measures on their behalf and will be required to cover all costs:

1. failing to conduct safety assessments of the nuclear facility periodically, or failing to submit to reviews by the nuclear safety regulatory authority under the State Council.
2. failing to manage the shutdown of the nuclear facility in a safe manner after its operation has been terminated, or failing to ensure the basic functions, technical personnel, and documentation required for decommissioning;
3. failing to reduce the level of radioactivity in structures, systems, and equipment to meet the requirements of standards when the nuclear facility is being decommissioned;
4. failing to convert the solid radioactive waste that the nuclear facility generates into stable and standardised solid waste, failing to convert the liquid radioactive waste that the nuclear facility cannot clean and discharge into stable and standardised solid waste, or failing to deliver said stable and standardised solid waste to a radioactive waste disposal entity for disposal in a timely manner; and
5. failing to treat the gaseous radioactive waste that the nuclear facility generates, or failing to meet the national standards for the prevention and control of radioactive pollution before discharging the treated waste.

ARTICLE 81 If, in violation of this law, the operator of a nuclear facility fails to monitor the type and concentration of radionuclides in the surrounding environment and the amount of radionuclides in the effluents discharged by the nuclear facility, or fails to report the monitoring results periodically, corrective measures will be ordered by the competent authority for environmental protection under the State Council or of the people's government in the province, autonomous region, or municipality directly under the Central Government where said nuclear facility is located, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed.

ARTICLE 82 If, in violation of this law, an entrusted technical support entity issues false technical evaluation conclusions, a fine of not less than 200 000 yuan nor more than 1 000 000 yuan will be imposed by the nuclear safety regulatory authority under the State Council; those who have received illegal proceeds will have said proceeds forfeited; a fine of not less than 100 000 yuan nor more than 200 000 yuan will be imposed on the directly responsible supervisor and other directly responsible personnel.

ARTICLE 83 If any of the following violations of this law occur, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 500 000 yuan nor more than 1 000 000 yuan will be imposed; those who have received illegal proceeds will have said proceeds forfeited; a fine of not less than 20 000 yuan nor more than 100 000 yuan will be imposed on the directly responsible supervisor and other directly responsible personnel:

1. providing a nuclear facility with design, manufacturing, installation, or non-destructive testing services for nuclear safety equipment without a licence; and
2. an overseas organisation provides a domestic nuclear facility with design, manufacturing, installation, or non-destructive testing services for nuclear safety equipment without registering.

ARTICLE 84 If, in violation of this law, the operator of a nuclear facility or entities that provide manufacturing, installation, or non-destructive testing services for nuclear safety equipment hire personnel who have not obtained appropriate qualifications to perform specialised technical work that concerns the safety of the nuclear facility, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed; those who refuse to take corrective measures will have their licences suspended or revoked, and a fine of not less than 20 000 yuan nor more than 100 000 yuan will be imposed on the directly responsible supervisor and other directly responsible personnel.

ARTICLE 85 Nuclear material possessed without a licence in violation of this law will be subject to forfeiture by the competent authority of the nuclear industry under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed; those who have received illegal proceeds will have said proceeds forfeited.

ARTICLE 86 If any of the following violations of this law occur, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed; in serious cases, a fine of not less than 500 000 yuan nor more than 2 000 000 yuan will be imposed; those who have polluted the environment will be ordered to implement pollution abatement measures to eliminate the pollution within a specified timeframe, and those who fail to implement the measures within the specified timeframe will be assigned a capable entity to implement the measures on their behalf and will be required to cover all costs:

1. engaging in the treatment, storage, and disposal of radioactive waste without a licence;
2. failing to establish a record archive to document radioactive waste disposals, failing to faithfully record information related to the disposal activities, or failing to retain the record archive permanently;
3. failing to follow the closure procedures in accordance with the law for a radioactive waste disposal facility that should be closed;
4. failing to set up permanent signs in demarcated areas for the closure of a radioactive waste disposal facility;
5. failing to develop a safety management plan for the closure of a radioactive waste disposal facility; and
6. failing to conduct safety management in accordance with the authorised safety management plan after a radioactive waste disposal facility has been closed.

ARTICLE 87 If any of the following violations of this law by the operator of a nuclear facility occur, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed; a fine of not less than 20 000 yuan nor more than 50 000 yuan will be imposed on the directly responsible supervisor and other directly responsible personnel:

1. failing to formulate an emergency plan for on-site nuclear accidents as required;
2. failing to furnish the nuclear facility with emergency equipment in accordance with the emergency plan, or failing to conduct training or drills for emergency workers; and
3. failing to carry out work in support of emergency response in accordance with the requirements of emergency rescue operations in the event of nuclear accidents.

ARTICLE 88 If, in violation of this law, the operator of a nuclear facility fails to disclose relevant information as required, corrective measures will be ordered by the nuclear safety regulatory authority under the State Council; for those who refuse to take corrective measures, a fine of not less than 100 000 yuan nor more than 500 000 yuan will be imposed.

ARTICLE 89 If, in violation of this law, an entity engaged in nuclear safety activities refuses or obstructs the supervisory work and inspections conducted in accordance with the law by the nuclear safety regulatory authority or other relevant authorities under the State Council, corrective measures will be ordered by the nuclear safety regulatory authority or other relevant authorities under the State Council, and a fine of not less than 100 000 yuan nor more than 500 000 yuan may be imposed; those who refuse to take corrective measures will have their licences suspended or revoked; those whose actions constitute a violation of public security administration will be subject to public security penalties by the public security authority in accordance with the law.

ARTICLE 90 In the event of a nuclear accident, the operator of a nuclear facility concerned shall be liable for bodily injury, death, property loss, or environmental damage caused by the accident in accordance with the national nuclear damage liability regime, unless it can be proven that the damage was caused by wars, armed conflicts, or riots.

The suppliers of equipment, engineering, and services to the operator of a nuclear facility are not liable for nuclear damage. If the operator of a nuclear facility has an agreement with said suppliers, the operator may seek recourse in accordance with the agreement after it has assumed liability for the damage.

The operator of a nuclear facility shall maintain adequate financial security by purchasing liability insurance, participating in mutual assistance programmes, and adopting other means in order to ensure the prompt and effective fulfilment of its liability for nuclear damage.

ARTICLE 91 Any violation of this law that constitutes a criminal offence will be investigated for criminal liability in accordance with the law.

Chapter 8 By-laws

ARTICLE 92 Nuclear safety for the defence industry and military affairs is specified separately by the State Council and the Central Military Commission in accordance with the principles stated in this law.

ARTICLE 93 For the purpose of this law:

"Nuclear accident" means one or a series of radioactive, toxic, explosive, or otherwise harmful accidents that involve nuclear fuel, radioactive products, or radioactive waste in a nuclear facility, or that involve the nuclear material transported into or out of a nuclear facility.

"Defence-in-depth" means the prevention of nuclear accidents and mitigation of their consequences by creating a series of progressively hierarchical and mutually independent protections, mitigating measures, or physical barriers.

"Operator of a nuclear facility" means an entity within the People's Republic of China that applies for or possesses a nuclear facility safety licence and is allowed to run and operate a nuclear facility.

"Nuclear safety equipment" means equipment used to perform nuclear safety functions in a nuclear facility, including mechanical and electrical equipment for nuclear safety.

"Spent fuel" means nuclear fuel permanently removed from a reactor core following irradiation in the core.

"Shutdown" means that a nuclear facility has terminated operations and will no longer be started up.

"Decommissioning" means taking measures, such as decontamination, dismantling, and removal, to reduce the radioactivity of a site or equipment that a nuclear facility no longer uses to a level that meets the requirements of relevant national standards for radiation doses.

"Experience feedback" means the summarisation and promotion of good practices through the collection, screening, assessment, analysis, processing, and distribution of information related to a nuclear facility, including events, quality issues, and good practices, in order to prevent similar events and issues from occurring again.

"Consignor" means an entity within the People's Republic of China that has applied and been authorised to prepare consignments and submit them for transport.

ARTICLE 94 This law will enter into force on 1 January 2018.

News briefs

23rd Nuclear Inter Jura Congress, November 2018

Every two years, the International Nuclear Law Association (INLA) organises a Congress called a "Nuclear Inter Jura" in which nuclear lawyers from around the world participate. The 23rd INLA Congress will take place in Abu Dhabi, United Arab Emirates, from Sunday 4 November to Thursday 8 November 2018. The INLA Board of Management will meet prior to the start of the Congress on Saturday, 3 November.

The theme of this year's Congress is "International Cooperation in Nuclear – Sustainability, Excellence & Innovation". The programme consists of a 4-day conference (4-7 November) followed by an excursion on Thursday, 8 November. The conference will be held at the Ritz-Carlton Abu Dhabi, Grand Canal.

The Second Announcement will be circulated soon and will contain all relevant information in terms of registration fees, the venue, accommodation option, travel packages, visa processes, etc.

International Nuclear Law Association United Kingdom Conference

INLA UK is holding its second National Conference on 28 June 2018 in Manchester, United Kingdom focusing on the practical application of nuclear law to nuclear projects. It will examine issues in the UK nuclear sector, with participation from the wider international nuclear community. The Conference will focus on key UK nuclear project legal issues and aims to be practical and interactive. The content is designed for both nuclear law practitioners and professionals, as well as policymakers, regulators and students. It provides an ideal introduction for newcomers to the UK nuclear legal sector, as well as benefitting experienced practitioners.

The one-day National Conference includes keynote speakers and has four key themes: decommissioning (including procurement update), Brexit and safeguards, liability, and new build and small modular reactors. It will conclude with an evening networking reception and dinner.

For further information or to register, please email: gareth.davies@davies nuclear.co.uk.

Recent publications

The Law of Nuclear Energy, Second Edition (2018) by Helen Cook[1]

The first edition of *The Law of Nuclear Energy* was published by Sweet & Maxwell in August 2013. Since publication, there have been multiple legal developments impacting the global civil nuclear sector. In the area of international nuclear liability, the Convention on Supplementary Compensation for Nuclear Damage entered into force in April 2015, creating a potential framework for unprecedented global nuclear liability coverage. In May 2016, the international nuclear security regime was strengthened with the entry into force of the Amendment to the Convention on the Physical Protection of Nuclear Material. In November 2016, the Paris Agreement of the United Nations Framework Convention on Climate Change entered into force, establishing an important energy policy platform upon which to consider the contribution that nuclear energy can make to achieving global and national climate goals. All of these developments, and others, are examined in the second edition.

The Law of Nuclear Energy is a comprehensive legal text book providing an overview of the legal and regulatory framework governing the global nuclear energy sector and contractual arrangements for the procurement, contracting and financing of new nuclear power plants and associated fuel cycle transactions. The book is split into three parts:

- Part 1: Legal infrastructure for nuclear energy;
- Part 2: Nuclear power new build; and
- Part 3: Future of nuclear law.

The book commences with a new chapter titled, "Nuclear Energy for Policy Makers", which addresses the complex set of benefits and challenges that may be considered by policymakers when determining the role of nuclear energy in a state's energy mix. While recognising that nuclear energy is not an energy solution for every state, part of the chapter is dedicated to exploring the potential contribution of nuclear energy to achieving global climate change goals, a key driver of current and future nuclear energy policy. The chapter concludes by commenting that every state that decides to continue or to develop a new nuclear power programme is making a serious and long-term commitment to ensure that its programme is peaceful, safe and secure for current and future generations, not only within its own borders but also for its neighbours and the world.

The remainder of Part 1 of the book addresses the international treaties and conventions relevant to the civilian nuclear energy sector and describes the contents of national nuclear energy laws and nuclear regulation, particularly as it applies to the licensing of new nuclear power plants. The second edition contains a new, dedicated chapter on nuclear liability.

Part 2 provides a more practical guide to the procurement, construction and financing of new nuclear power plants, with a chapter dedicated to the primary legal aspects of each phase. Nuclear fuel cycle transactions are also discussed, with a

1. More information about the book, including purchasing details, can be found on the publisher's website at: www.sweetandmaxwell.co.uk/Catalogue/ProductDetails.aspx?productid=684299&recordid=6759.

chapter dedicated to legal issues arising with respect to the front end and back end of the nuclear fuel cycle.

Part 3 concludes with chapters exploring the benefits and legal challenges presented by small modular nuclear reactors, as well as canvassing issues of significance for the future of nuclear law.

While it draws on examples from the nuclear law of established nuclear countries, such as the United Kingdom and United States, this book is not jurisdiction-specific. It is intended to be generally applicable to a broad audience of policymakers, legislators, regulators, owners, vendors, investors, fuel suppliers and lawyers active in the nuclear sector. It may be particularly useful for any such individuals working in, or for, countries contemplating or developing nuclear power programmes for the first time.

Handbook on Nuclear Regulatory Framework in India (2018) by Tyson R. Smith and M.P. Ram Mohan[2]

The *Handbook on Nuclear Regulatory Framework in India* provides a comprehensive introduction to the nuclear regulatory framework in India covering all the fundamental information needed to understand this subject. Written in plain English, the book is useful for anyone trying to better understand India's regulatory system.

Specifically, the *Handbook on Nuclear Regulatory Framework in India* begins with an overview of the Atomic Energy Regulatory Board's (AERB) regulatory structure and functions and proceeds to a discussion of the types of facilities and activities it regulates. Next, it outlines the hierarchy of regulatory requirements in India as well as the consent process. In particular, the book addresses in detail the new reactor licensing process as well as the process for ensuring the safety of operating reactors. It pays particular attention to nuclear liability in India, explaining the Civil Liability for Nuclear Damage Act and the Indian insurance system. Finally, the book ends with a look at the AERB's international engagement and the AERB Code of Ethics.

Euratom at the Crossroads (2018) by Anna Södersten[3]

Addressing the contentious debate surrounding the future of the European Atomic Energy Community Treaty (Euratom Treaty), *Euratom at the Crossroads* offers an examination of Euratom from an institutional and structural perspective, and in doing so, investigates the legal implications of its continued separate existence. Using primary material as key sources for analysis, this book explores the relationship between the Euratom Treaty and two other core European Union (EU) treaties, the Treaty on European Union (TEU) and the Treaty on the Functioning of the European Union (TFEU).

The book begins with an introduction and a brief history of the Euratom Treaty, addressing the legal, political and economic context in which the Euratom Treaty arose. *Euratom at the Crossroads* then takes a two-part approach to address the central research question of the book: What are the legal implications of the continued separate existence of Euratom within the EU? As explained by the author, "[t]he aim is to establish whether the [European Atomic Energy Community] ought to be kept separate from the [European] Union or brought into the EU framework."[4]

2. More information about the book, including purchasing details, can be found on the publisher's website at: www.ebcwebstore.com/product_info.php?products_id=99021987.
3. More information about the book, including purchasing details, can be found on the publisher's website at: www.e-elgar.com/shop/euratom-at-the-crossroads.
4. Södersten, A. (2018), *Euratom at the Crossroads*, Edward Elgar Publishing, Cheltenham, UK, p. 2.

Another related question addressed by the author is whether it is still relevant that one of the EU's founding treaties is the promotion of nuclear energy.[5]

Part I of *Euratom at the Crossroads* addresses structural issues and entails a theoretical discussion. Part II addresses the substantive law of Euratom to illustrate the relationship between Euratom and the EU. Examining each of the Euratom Treaty chapters in detail, the book compares the Euratom Treaty to the TEU and the TEFU to find gaps as well as overlaps to ultimately ask whether it matters which treaty is being applied, what difference it makes and what the added value is of the Euratom Treaty. *Euratom at the Crossroads* concludes that there is no need for the Euratom Treaty to exist as a separate treaty from the European Union treaties, though reforms could be challenging.[6]

5. *Ibid.*
6. *Ibid.*, pp. 234-235.

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Feature articles and studies in this issue include: "Legal challenges to the operation of nuclear reactors in Japan"; "Inside nuclear baseball: Reflections on the development of the safety conventions"; and "The Peaceful Nuclear Energy Program in the United Arab Emirates: Background and history".

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