Der Beitrag behandelt die Frage der internationalen Standardisierung von Reaktordesigns. Dieses Konzept bietet sich als Mittel an, um die Genehmigungsrisiken zu verringern, die Hemmschwelle für Investitionen zu senken und gleichzeitig den sicherheitsgerichteten Erfahrungsaustausch zu befördern. Statt in jedem Land „das Rad neu zu erfinden" – wie in Europa für den EPR geschehen –, wäre es sinnvoller, den Erstling eines Reaktordesigns in anderen Ländern einfach zu replizieren, soweit der jeweilige Standort das zulässt. Änderungen im Design, die nur den Besonderheiten der jeweiligen nationalen Regelungen geschuldet sind, sollten der Vergangenheit angehören.

Im Aufsatz werden einige Initiativen für verstärkte Zusammenarbeit und Standardisierung vorgestellt. Im Mittelpunkt stehen die CORDEL Arbeitsgruppe der World Nuclear Association (WNA) und die ERDA (European Reactor Design Acceptance) Gruppe im European Nuclear Energy Forum (ENEF). Von letzterer werden hoffentlich Impulse ausgehen, die Fortschritte innerhalb der EU ermöglichen.

Es gibt durchaus Vorbilder. In Deutschland ist die deutsch-französische Zusammenarbeit beim EPR in den 1990er-Jahren noch in Erinnerung als Beispiel für eine pragmatische Kooperation. Ein weiteres Vorbild ist die zivile Luftfahrt, die seit über 60 Jahren Strukturen für eine starke internationale Zusammenarbeit entwickelt hat, um die weltweite Zulassung einheitlicher Flugzeugtypen zu ermöglichen, ohne die Rechte und Pflichten nationaler Aufsichtsbehörden zu beschneiden.

Regulatory challenges in the licensing of new nuclear power plant – From CORDEL to ERDA

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Current situation for new build projects

Nuclear new build in the last century was governed by national regimes. Global interaction was limited. Major industrial countries had their own national nuclear vendor with their own designs developed from scratch or based on foreign models but substantially adapted nationally. Nuclear operators were mainly state owned; at least they operated in a regulated market.

Today's situation is different. Few vendors and designers offer their product globally and in many countries the electricity market is liberalized. Large operating companies tend to invest internationally. This results in both opportunities and challenges. In a competitive and globalized environment, the very high construction costs and the connected investment risks discourage private investors. This is exacerbated by the financial crisis and by uncertainties about future development of fossil fuel prices and carbon cost.

One element to ease the burden and to control construction cost would be the opportunity to build reactors of standardised design in several countries the same way. In order to reach this goal, some form of an international licensing regime must be established. This is even more necessary today after *Fukushima* as lessons learned from this event, which will lead to modifications of reactor designs, must be implemented in an internationally harmonized way.

Another aspect is that even after *Fukushima,* many newcomer countries want to start nuclear power programmes but they cannot be expected to create a regulatory infrastructure like those of experienced nuclear countries within a few years. While they must definitely be expected to comply with certain standards in their regulatory systems, at the same time it is necessary that they can rely on internationally accepted reactor designs if nuclear should really become an option for those states.

The need for standardization of designs and common reactor licensing

This situation has given rise to the idea that a nuclear reactor design should be reviewed and approved on an international basis, rather than being separately reviewed by each national regulator in each state where a nuclear power plant of that design is to be built, as is the case now. A striking example of the current situation is the *Areva* EPR. The design of *Olkiluoto 3* in Finland is different from that of *Flamanville 3* in France, and it seems the design for the planned reactors in *Hinkley Point* in the UK will again have some specific aspects. While differences in licensing and safety requirements may not account for all of these deviations, they certainly played an important role. Instead of "re-inventing the wheel" every time, international standardization looks at ways to achieve a cross-border design review and acceptance, the results of which are shared among several states. Such a reactor design acceptance would be issued or mutually shared by a voluntary group of national regulators. As a result, a given reactor design can be built in the same way in all participating countries, except for necessary adaptation to site-specific conditions.

Such an approach of cross-border reactor design approval would enable nuclear industry to deliver standardized reactors. In today's new build environment, customization of nuclear reactors involves delays, cost increases and uncertainty as to licencing. International standardization of reactor designs would help to prevent delays and cost overruns and give more certainty to investors, particularly once the first plant of a given design has been licensed and constructed anywhere in the world.

The second great benefit of standardization is its positive impact on safety. Based on fleets of nuclear power plants of a given design, the exchange of construction and operation experience could be much more effective and take place on a much broader basis

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than today. Design changes, developed to address shortcomings or to reflect an advance in technology, could be implemented in all plants of the international fleet in a coherent and efficient manner. It might be argued this is the only response to the challenge of raising the existing very high level of safety even further while at the same time expanding the use of nuclear [1].

International standardization does not imply that there is only one reactor design in the world. Instead, international standardization would mean that all vendors could build their design in any country without having to adapt it to national regulations. Similarly, any utility wanting to order and to operate a nuclear power plant in any given country would be able to choose a design on the basis of its technical and economic merits from a choice of vendors (who are in most cases foreign companies), and to order it and have it constructed as it is, without having to customize it to the national regulatory framework. There will, of course, always have to be some adaptation of the design to specific local elements such as the chosen site or the operation policy of the future owner. However, the main elements of the design, those which define the safety level and which are most important for licensing, should remain unchanged.

It must be pointed out from the start that the idea of common reactor approval does not mean establishing a supranational authority issuing reactor licenses that would apply all over its jurisdiction (of course, it should not be ruled out to retain the idea of such an authority as a very long-term vision). As already pointed out, the basis of a cross-border reactor design approval would be an association of regulators, each of whom retains its sovereign responsibility. It also does not mean hoisting the entire licensing procedure of nuclear power plants to the level of international cooperation. Design review and acceptance is just one part of the licensing process for a nuclear power plant. It will remain the exclusive right and duty of national regulators to formally accept the standardized designs and to make a full assessment of the suitability of the site and of the operators' capabilities before issuing the construction and operating licence for any given nuclear power plant. The aim is not to erode national sovereignty but to reap benefits from stronger and more efficient cooperation.

Legal challenges to standardization and common licensing

An approach as sketched in the previous chapter would entail some changes in the regulatory framework, and possibly in the legislation, of the countries involved. According to the current situation, each new nuclear power plant needs a licence granted by the competent national regulatory body in a nationally defined procedure, based on national requirements. This has 3 major consequences. [2]

First, the licence is granted to the applicant – the future owner/operator – only if the prerequisites of national law are met. Although there is much similarity in top-level goals, national safety requirements can be very different. The same is true for the ways to demonstrate safety which can be very different in their details. To give an example, the non-prescriptive, goal-setting UK approach is much different from the system adopted by the US-*NRC* with its detailed regulations. As a consequence, if applications were filed for the same standardized design to be built and operated in different countries, the nuclear power plants actually resulting from the licensing process, having undergone all adaptations necessary to fulfil the requirements in each country, would show both significant alterations to the original design and significant differences between them.

Second, licencing procedures as defined by laws, decrees and regulations are very different from country to country [3]. In some countries, like in the UK, there is one-step licensing, covering all stages of a nuclear power plant's life; in other countries, separate licences may be issued for siting, construction, commissioning and operation. Another difference in licensing procedures is whether national regulations allow for the design of a nuclear power plant to be approved in a generic and project-independent manner. In the UK, this has been addressed with the introduction of the Generic Design Assessment; however, its outcome has a different status as compared, for example, to the US Design Certification, which is binding on the regulator.

Third – and perhaps most conspicuous –, precisely because each national regulator is bound to evaluate a licence application according to national procedures and to national requirements, a licensing decision taken previously by another country's regulator is more or less irrelevant, even if it concerns the same reactor design. Regulators claim they have to follow their own procedures and safety standards and are responsible vis-à-vis their own governments and their own citizens. This means they can have a look at what their peers in other countries have done, but they cannot take over, wholly or in part, a foreign design approval. [4]

Therefore, in order to support standardization, we need a change in national and international regulatory approaches to address these 3 facts:

- The national safety requirements need to be progressively harmonized to eliminate the need for customization of designs in order to adapt them to the regulations of every country separately.
- The national licensing procedures need to be perhaps not totally aligned, but at least made compatible so approvals and licences can be better compared and, if possible, exchanged.
- A design approval [5] issued by one regulator should have an effect (to be defined) on the licensing decision of another regulator if it concerns the same design. The greatest possible effect would be to assign cross-border validity to a given design approval.

The fact remains that nuclear power plant licences will be issued by national regulators according to national rules and procedures. The concept merely suggests to align these rules and procedures and to enable regulators to rely on design approvals issued by a group of their peers. These changes will establish the necessary regulatory environment to achieve full international standardization of nuclear reactor designs.

Initiatives on standardization and cross-border cooperation

Given the obvious merits of international alignment and cooperation in reactor assessment and licensing, the past years have seen the birth and development of some initiatives led by various stakeholders.

MDEP

Recognizing the advantages of regulatory collaboration and sharing the burden of design assessment, regulators have responded by founding the Multinational Design Evaluation Programme (MDEP). This is an initiative comprising the regulators of 11 newbuild countries with the aim of leveraging resources and identifying common regulatory practices [6]. The participating regulators discuss issue-specific and design-specific topics; regulators who are currently processing a licence application explain to their peers what they are doing and why. This is a very important first step towards a greater international cooperation. However, MDEP, which is a "club" of regulators not based on any intergovernmental treaty, is taking a very pragmatic and non-visionary approach and does not pursue an international framework to permit multinational validity of a design approval.

WNA CORDEL

The *World Nuclear Association's CORDEL* (Cooperation in Reactor Design Evaluation and Licensing) *Working Group* was established in January 2007 with the aim of promoting the achievement of a worldwide regulatory environment where internationally accepted standardized reactor designs can be widely deployed without major design changes. Its

membership consists of industry specialists in reactor licensing, nuclear law and reactor safety engineering, representing reactor vendor companies, utilities, technical support and consulting services and international organizations involved or directly interested in reactor licensing for new nuclear build. It has published several reports which are available on the *WNA* website. The main paper outlining *CORDEL's* vision and proposing a way forward in 3 steps is the report "International Standardization of Nuclear Reactor Designs" published in January 2010. [7]

ENEF ERDA

In 2007, the *European Commission* created the *European Nuclear Energy Forum (ENEF)* as a platform for all stakeholders in nuclear energy in Europe. Within the framework of *ENEF*, the *ERDA (European Reactor Design Acceptance) Core Group* was created in 2011. Its objective is to find, and propose via *ENEF* to the Commission, ways of achieving an "European Reactor Design Acceptance", issued by a national authority, or a group of national authorities adhering to a common initiative, and accepted in several or all EU member states where new nuclear power plants are or will be built. This includes analysing, besides related activities in the nuclear regimes, existing European models for enhanced cooperation of regulators and mutual acceptance of approvals implemented in other industries, for instance in the aviation industry. The *ERDA* Roadmap was finalised earlier this year (August 2012) and will soon be published. It was presented to the EU Commission in October 2012 and it will hopefully be discussed with *ENSREG (European Nuclear Safety Regulators Group)* soon.

ENEF Survey on Licensing

The framework of *ENEF* comprises many other Working Groups and *SubWGs*, among them the *SubWG "Nuclear Legal Roadmap"*. One of its tasks as defined by the *ENEF* Plenary Meeting is to explore ways to achieve a "greater harmonization of licensing procedures". In a 2008 paper, the *SubWG* pointed out that the licensing procedure for a nuclear power plant must be efficient and predictable in order to allow potential investors to take their investment decision in EU Member States where new nuclear is an option [8]. In 2010, the *European Commission,* together with the *SubWG*, commissioned a report by the Brussels law firm *Philippe & Partners* "Report on Survey of Licensing Procedures for New Nuclear Installations in EU Countries", the final version of which was delivered on 17 February 2012. [9] Using the results of the comparative analysis in the Report as a basis, the *SubWG* issued a document with conclusions regarding best practices which could, in a long-term perspective, support improvement and progress toward harmonisation of these national licensing procedures. [10]

WNA Licensing & Permitting Survey

WNA in 2011 created a *Licensing & Permitting Task Force* which is sponsored jointly by the *Cooperation in Reactor Design Evaluation and Licensing (CORDEL) WG* and the *Nuclear Law and Contracting WG* of *WNA*. It has written a report [11] which is based on the outcome of a survey conducted among *WNA* members. The aim of the survey and the report was to explore the relationship between licensing and regulatory systems on the one hand and important commercial project decisions, like scheduling, financing (FID), vendor selection, procurement etc. on the other hand. The results show ways not only to make national licensing procedures more efficient, but also to enhance the international aspect of licensing.

Elements of cross-border reactor design approval

While *MDEP* is taking a decidedly pragmatic approach and is careful to underline that "national regulators retain sovereign authority for all licensing and regulatory decisions" [12], *CORDEL* and *ERDA* have developed policy papers with concepts how to go some steps further, nevertheless without jeopardising the regulators' independence. The *CORDEL* and the *ERDA* concept are closely related.

The *CORDEL* concept is laid down in the fundamental "Roadmap" of January 2010 [13]. It comprises 3 steps: [14]

1) **Share Elements of Design Assessment.** Once a design is licensed in one country, the approving regulator should share information with other national regulators, conveying its full experience in the safety assessment of the design; and receiving regulators should draw upon this experience. In addition, if several regulators are concurrently reviewing the same design, they could form a team and discuss their assessment methodology (incl. criteria) and share their assessment results. This sharing process, which can be undertaken without any change in existing regulatory frameworks, may itself foster tendencies toward harmonization in licensing standards and procedures.
2) **Validate and Accept Design Approval.** Once a design is licensed in certain countries that are highly respected for their regulatory expertise, such design approval could be taken by other countries' authorities after a validation as sufficient for licensing there. Although using this simplified validation procedure would heighten efficiency for industry and regulators, it may require some adjustments in existing national legislative and regulatory frameworks.
3) **Issue International Design Certification.** By international agreement, a procedure could be created whereby a design could be certified by a team of national regulators (from countries with a direct interest in the design). Under the agreement, participating countries would accept this certification. Alternatively, such international certification could be facilitated by a designated international organization. Even in the latter case, national regulators would remain responsible for assessing the adaptation of the internationally certified design to local circumstances and for the supervision of construction, commissioning and operation.

In parallel, according to *CORDEL,* expanding regulatory cooperation has to be simultaneously facilitated by alignment of licensing processes and by harmonization of national safety requirements.

This approach was further refined in the *ERDA* Roadmap [15]. Like *CORDEL, ERDA* is not suggesting reactor licensing by a new dedicated international (EU) authority. Instead, it builds on new coordination of the structures and the players of national licensing procedures and reactor safety standard setting, focused mainly on the national regulators, but also on Technical Support Organisations (TSOs) and industry standardization organisations. The following elements of an overarching *ERDA* concept are proposed

- All interested Member States should introduce a "stand-alone design acceptance" process as a first step in their licensing regime, as it already exists in some Member States. Such a process allows for assessment of a design independently of a specific project for construction. It results in a "design acceptance certificate" which is both useful for subsequent domestic licensing processes as well as for the work of other regulators.
- Progress in harmonization of safety requirements is an obvious prerequisite for common reactor design acceptance. Harmonization in the EU is already well underway through the *International Atomic Energy Agency (IAEA)* standards and the work of *WENRA*; this needs to be continued. Additionally, further work could be done to promote the recognition and adoption of nuclear industry common standards.
- Based on these steps, a "validation" process (see schedule below) could be envisaged in a situation where an operator applies for a nuclear power plant licence based on a reactor design previously assessed in another Member State. In close cooperation with the first regulator and after its own review, the regulator could

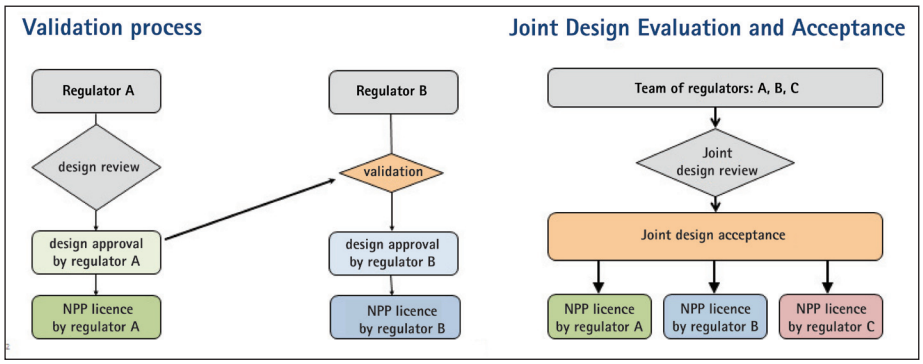

Fig. 1.

"validate" the design acceptance of its fellow regulator, if necessary with some changes or caveats.

- When a reactor design is submitted to a licence process in several countries at roughly the same time or if there is a general credible interest in a design in several countries with a view to deployment, the national regulators should create a joint team of experts from their own staff with the adequate competencies and perform a joint design evaluation and acceptance (see schedule above). In a first, more informal phase, the common result would be voluntarily transferred by each participating regulator into his national licensing process. In a more advanced phase, there could be a multinational agreement between the Member States concerned, installing a system of joint acceptance of new designs proposed for implementation in several of them. Such a multilateral agreement could work similarly to the well-known "Schengen Agreement" about abolition of frontier checks and a common external frontier which was concluded between a subset of EU countries willing to take this issue forward. Formal delivery of a licence by the national regulator would still be necessary for any nuclear power plant project to proceed in a particular country.
- Finally, substantial support could come from the collaboration of European TSOs who could perform joint design reviews under the auspices of a regulator or a group of regulators in the context of the cooperation models presented above.

Findings of the two Surveys on Licensing

Both the *ENEF* Survey and the *WNA* report on licensing (see above) are based on an extensive comparison and analysis of existing national licensing procedures. The comparison as such is helpful for identifying areas for further alignment. Besides, both the *ENEF SubWG* and the *WNA Task Force* have, as a result of their analysis, suggested some aspects for streamlining licensing procedures and for achieving a stronger link between the procedures of different countries.

The *ENEF SubWG* in its paper [16] gave some observations on best practices in licensing which could lead to both improvement and, to a certain extent, alignment of national procedures and to enhanced cooperation of regulators. The 2 main conclusions relevant for the present paper are:

- The existence of a separate generic approval of a design and/or a site, prior to a licensing procedure for a particular nuclear power plant, greatly enhances the efficiency and predictability of a national licensing regime. Another aspect of a pre-licensing generic design approval is that it could enhance the possibility of taking over design assessments and approvals from other countries.
- Given the current situation with standalone national licensing procedures, the conclusions underline the relevance of the *ERDA* process.

The *WNA* Licensing and Permitting Report [17] comes to similar conclusions. It emphasises the role of clear, predictable and efficient licensing in order to facilitate investment in new nuclear power. One of its main features is to analyse the way how licensing steps and procedures should best interact with the commercial milestones in project development. Very clearly, the report concludes that international standardization and cross-border design approval would be a big step forward to enable nuclear new build in all countries which have a policy of maintaining or introducing nuclear power.

Existing examples for cross-border licensing

There are some examples for an approach of international standardization and cross-border approvals, both in the nuclear field and in other industries.

Nuclear

A good example of how such an approach can work in practice can be found in the Franco-German review of the European Pressurized Water Reactor (EPR) in the 1990s. The *Technical Support Organisations (TSOs)* of both countries (*IRSN* and *GRS*) worked together to develop common detailed technical guidelines [18] for this design under the auspices of the French and German regulators. If Germany had not reversed its nuclear policy at the end of the 90s, it is very likely that EPRs built in France and Germany would have had a very similar design basis of the nuclear island. From a legal perspective, it is interesting to note that this common approach would have been possible under existing legislation in both countries and that it would not in any way have affected the independence and sovereign responsibility of either regulator.

Aviation

In civil aviation, there is an international framework for licensing based on the *Chicago Convention on International Civil Aviation* linked to a specialized UN agency, the *International Civil Aviation Organization (ICAO)*.

In each country where an aircraft of a certain type is to be registered, a Type Certificate is awarded to the designer/manufacturer of the design by the competent national or regional aviation authority. Type Certificates are issued first by the regulator of the country of origin of the design (State of design) and then by the regulators of all other countries where an aircraft of this design is to be registered (State of registry). The Type Certificate, which attests compliance of an aircraft type (design) with applicable safety standards, can be roughly compared to a reactor design certification as it is issued in some countries.

A carefully balanced international system exists to facilitate and streamline the certification processes:

- The *Chicago Convention on International Civil Aviation* provides a general international framework for regulatory cooperation and an envelope of minimum safety standards which are complemented by more detailed national codes.
- There is no automatic international validity of a Type Certificate issued by the regulator of the State of design or by any other regulator. However, authorities collaborate in type certification on the basis of bilateral agreements. Through conducting an evaluation of each other, participating authorities conclude that the other party is a trustworthy and experienced regulator with well-established procedures. This is the basis for concluding the bilateral agreement which leads to mutual acceptance of Type Certificates under certain conditions.
- When performing its design reviews, the aviation authority of the State of design

involves experts from the aviation authorities of the major other countries in the review team. This results in literally simultaneous production of Type Certificates in all countries involved. Authorities which do their review later will also closely cooperate with the authority of the State of design.
- Even if there is no bilateral agreement, the authorities of other countries will not re-do the assessment done by the authority of the State of design. Instead, they will concentrate on validating the Certificate against those requirements which are specific to their own regulations (the "national delta"). In practice this may have the additional effect of leading to a re-evaluation of those deviating requirements whether they are really justified.
- Once the Type Certificate is issued, the authorities will work together closely both among themselves and with the designer and the operators to exchange findings and to find common agreed solutions for design improvements (Airworthiness Directives). These improvements are implemented in the entire fleet of an aircraft design in a consistent manner across all States of registry.

In the EU, this international system has been taken to a new level by the creation of the *European Aviation Safety Agency (EASA)* in 2002. The *EASA* is competent in the EU to issue Type Certificates which are valid in all EU Member States. *CORDEL* and *ERDA* do not propose, at least not in the short- and mid-term, to achieve anything comparable for nuclear by founding an International or European Nuclear Agency. Instead, it would already be a major step forward if the existing international (non-EU) system of regulatory cooperation and harmonization of standards, as explained above, could be taken as a model for nuclear.

However, it is of high interest to analyse the development leading to the creation of *EASA*. The process started with a voluntary cooperation of the national aviation authorities. In 1970, they founded the *Joint Aviation Authorities (JAA)*. The main objectives of this association were to facilitate certification of aircraft designed jointly in Europe (like the Concorde) and to achieve a greater alignment of European national standards with each other and with the US standards. In the course of time, an additional objective came into focus: to achieve a more integrated structure with stronger collaboration of regulators and a common approach on certification. This stage was concluded with the signing, by the national regulatory authorities, of the "JAA arrangements" in Cyprus in 1990 (Cyprus Arrangements). [19] They are founded on "the benefits of a European approach to obtain a high consistent level of safety". [20]
The parties agreed to

- Develop common rules and certification procedures and to transpose them in their legal order
- Certify collectively the products designed in their countries or imported from a third country
- Conduct regular peer inspections to verify that the common rules and procedures are effectively and uniformly implemented by all parties.

There was a commitment by the participating authorities to gradually phase out national deviations, and there certainly was a strong peer pressure to do so. However, in the Cyprus Agreements there was a clause safeguarding that any authority would only take over the common standards and procedures as long as "they allow fulfilment of its national obligations as civil aviation Authority".

JAA eventually became history when Europe went even further and *EASA* took over its functions. Given the current status in the nuclear field, it does not seem unreasonable to suggest that the 1990 Cyprus Arrangements could be used as a blueprint for a voluntary association of regulators under common Terms of Reference with the aim of sharing design reviews, without in any way compromising the national sovereignty and full-scope competence of all authorities involved.

Conclusion

Mechanisms of cross-border reactor design approval are an essential step to achieve the deployment of standardized reactor designs in the EU and in the world, contributing to the role of nuclear energy in the long-term low carbon energy mix. Given the current situation where a number of states is willing to pursue new build programmes, but where economic and regulatory uncertainties and challenges seem to be major hurdles for investment decisions in nuclear power plant projects, in the long-term there is no alternative to such a standardization approach for reducing the investment risks and at the same time for reaching an even higher and harmonized level of safety.

[1] *John Waddington,* Challenges to the regulation of Generation III reactors and the nuclear renaissance, a presentation held at the Nuclear Inter Jura Congress, 5-9 October 2009, Toronto (not included in the proceedings).
[2] See already *Christian Raetzke,* International Standardization of Nuclear Reactor Designs – Adapting the Legal and Regulatory Framework, Presentation to the Nuclear Inter Jura Congress 2009 in Toronto, Proceedings, p. 33.
[3] The regulatory and licensing systems of 9 countries are depicted and compared in: *Christian Raetzke* and *Michael Micklinghoff,* Existing Nuclear Power Plants and New Safety Requirements – An International Survey, A Description of the Legal Situation and of the Regulatory Practice in Eight Countries and in Germany, Heymanns 2006 (bilingual version German and English). The countries featuring in the survey are Belgium, Finland, France, Germany, Spain, Sweden, Switzerland, the United Kingdom and the United States.
[4] This is emphasized in a policy document by the *NII*: New nuclear power stations – Generic Design Assessment – Safety assessment in an international context, March 2009, paras. 6 to 16; the document is available at http://www.hse.gov.uk/newreactors/international.htm
[5] "Design approval" is used here as a general term for the "clearance" of a design by the competent authority – be it in a stand-alone document (like the US design certification) or as an element of a licence for a specific project.
[6] The 10 founding members are the national regulators of: Canada, China, Finland, France, Japan, South Korea, Russia, South Africa, the United Kingdom and the United States. In April 2012, *India's Atomic Energy Regulatory Board* joined the group as 11th member. The function of a technical secretariat is fulfilled by the *OECD-NEA* in Paris. Since March 2008, following the completion of a pilot project phase, started in 2006, *MDEP* is in full working mode. The work in *MDEP* is done by different working groups. There are two design-specific working groups (for the EPR and for the AP1000) and 3 issue-specific working groups (Digital I&C Standards; Codes and Standards; and Vendor Inspection Cooperation). For more information, see http://www.nea.fr/mdep.
[7] The report is available at http://www.world-nuclear.org/uploadedFiles/org/reference/pdf/CORDELreport2010.pdf
[8] *ENEF SubWG Nuclear Legal Roadmap*, The Importance of New Approaches in Licensing, October 2008. The paper is available at ec.europa.eu/energy/nuclear/forum/opportunities/doc/legal_roadmap/ the_importance_of_new_approaches_in_licensing.pdf
[9] The report is available at http://ec.europa.eu/energy/nuclear/forum/opportunities/doc/legal_roadmap/20120907_final_report_licensing_survey.pdf
[10] Publication of the document on the *ENEF* website is forthcoming (see previous footnote).
[11] To be published soon on the *WNA* website: www.world-nuclear.org
[12] This is a quote from the introductory page of *MDEP's* website at http://www.oecd-nea.org/mdep. It is quite telling that this sentence is the only one on the entire page highlighted by using bold type.
[13] "International Standardization of Nuclear Reactor Designs", see above, footnote 7
[14] This concept was already explained (in the draft state it had at that time) in the presentation given by *Christian Raetzke* in Toronto, see footnote 2
[15] "Roadmap towards European Reactor Design Approval", August 2012; publication on the *ENEF* website is forthcoming.
[16] See above, footnote 11
[17] To be published soon on the *WNA* website: www.world-nuclear.org
[18] Technical guidelines for the design and construction of the next generation of nuclear power plants with pressurized water reactors; adopted during the *GPR*/German experts plenary meetings held on October 19th and 26th, 2000
[19] Arrangements Concerning the Development, the Acceptance and the Implementation of Joint Aviation Requirements, Cyprus, 11 September 1990, available at https://easa.europa.eu/rulemaking/docs/international/archive/cyprus.pdf
[20] Cyprus Arrangements, page 1, Considerations, first bullet point