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SMR 2015

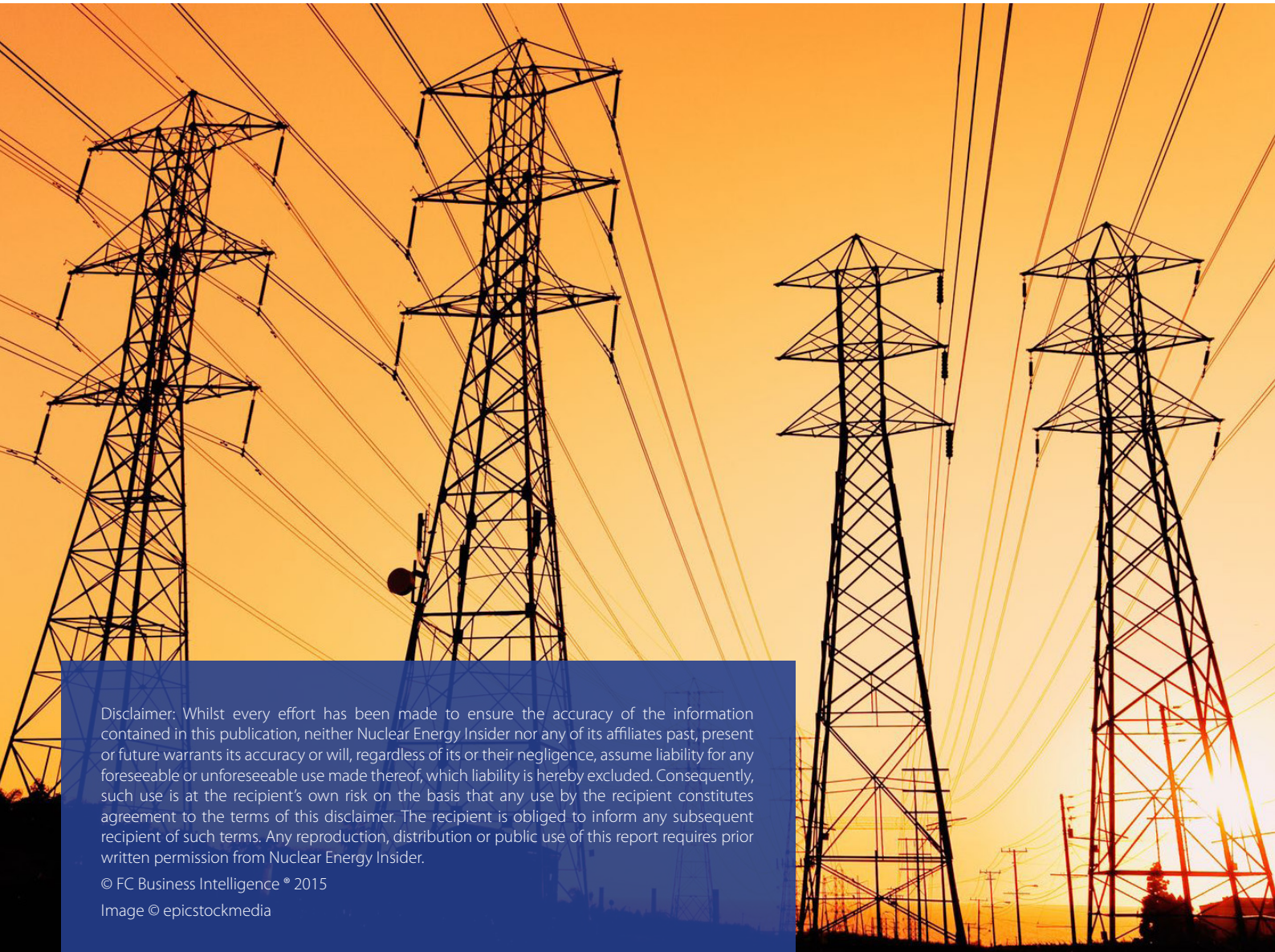
Activity to Reduce International Licensing Hurdles for SMRs

An exclusive conversation with WNA CORDEL SMR Group co-chair Kristiina Söderholm

By Kerr Jeferies
Senior Industry Analyst
Nuclear Energy Insider

Contributing partner

World Nuclear Association



World Nuclear Association

Introduction

The global SMR market remains vibrant and is continuously evolving. The critical drivers that initially ignited the SMR industry still exist and the international deployment case for SMR technology is only getting stronger.

Internationally there is a huge amount of promise, the UK has outlined its ambition to develop and deploy the technology whilst Middle Eastern nations amongst others retain a strong and ever growing interest in the SMR revolution.

Perhaps the biggest potential stumbling block lies in the ability of regulatory regimes across the world to adapt to the core concepts behind SMR technology. Hypothetically speaking, even if an SMR vendor had a warehouse of cheap reactors ready to deploy he would still struggle to shift them. The fact that each customer nation would be required to submit to the regulatory processes of each sovereign regime is a major challenge to the viability of SMRs.

Whilst we all appreciate that nuclear is held to a much higher standard of safety regulation than any other energy source, a substantial effort to standardize design licensing and certification will be required if we are ever to witness the kinds of economic returns being predicted by technology developers.

For this reason, we spoke to **WNA CORDEL SMR Group co-chair Kristiina Söderholm**. The CORDEL SMR Group is spearheading efforts to assess and adapt international regulatory regimes. Their work will prove invaluable over the next 5-7 years and we caught up with her to get the latest on their pioneering efforts.

Kristiina Söderholm

WNA CORDEL SMR Group co-chair

Kristiina Söderholm began her nuclear career in 2001 through the MSc Thesis discussing severe nuclear accidents and completed her MSc studies in physics, in 2004. And she completed her doctorate degree in nuclear engineering, in 2013, with PhD thesis on licensing process development for Small Modular Reactors.

Kristiina Söderholm has worked in several new NPP projects in different safety and licensing roles. Her responsibilities have included wide range of specialized fields, including licensing process development, technical specifications and bid evaluations, systems engineering and project management as well as various nuclear safety related responsibilities.

Currently she works as Head of Nuclear R&D in Fortum, she is board member in Finnish national R&D programs, and she is co-cheer of WNA CORDEL SMR Group. Kristiina has various publications in SMR, licensing and systems engineering fields.

Why has Fortum chosen to explore SMR technology as a part of its future energy portfolio?

Fortum hasn't chosen any specific reactor technology to be built in Finland at the moment. In Finland the licensing process requires political decision from the government to be able to start a new nuclear project. Currently we don't have this political approval. This being said, we are interested in new nuclear in the future and at the moment we see it important to remove as many project and licensing hurdles as possible to enable new nuclear to be built successfully in the future.

SMRs we see as one option (we are also looking at large LWRs). Future energy production system will be very different from the current situation, as renewables and smart grid application are getting more important for the whole system.

Currently we are trying to make sure that from the legal and licensing point of view the future nuclear technologies are understood and the possible hurdles removed well before the actual decision to build new nuclear.

Currently we are co-owners in new EPR project in Olkiluoto (Olkiluoto 3) and we have announced to possibly become a co-owner of Fennovoima new VVER-project in Finland as well. So we have a good understanding of large NPP projects and their obstacles, now we want to complete the big picture understanding also the SMR type of reactors better.

What do you believe needs to be done to secure confidence in the international community's ability to license and regulate SMRs?

The current way of licensing is very slow and heavy process in many countries. And the fact is that no certification or license can be utilized in another country. This makes it difficult and very expensive to license any NPPs in multiple countries. For example the ESBWR that had the design certification from the NRC is not directly suitable for Finnish (or European) regulatory environment. For SMRs this issue becomes even bigger, since for one project the licensing is just too huge effort to even start.

We have been harmonizing the regulatory requirement for many years and many cooperation activities are ongoing. However, it hasn't changed the fact that every single design needs to go through the licensing in every single country that the design wants to be deployed in.

I believe that with SMRs and in this environment that the change of nuclear energy is obligatory, we could make it happen step by step, this is why in WNA CORDEL SMR group we have been active in proposing new type of licensing process for SMRs.

What is the latest on the WNA CORDEL group's recent study?

The paper, what we have finalized just recently, is about SMR licensing process and it proposes a new module certification foe SMRs. The point in this proposal is to separate plant related issues (that change according to the sire characters, etc.) from the main nuclear safety issues. This is why the module certification includes only information and parameters of the actual reactor module and main safety systems. In this scope the requirements do not differ that much in different countries, but when moving further away from main safety systems, the requirements, safety classifications, etc. differ dramatically.

WNA CORDEL STUDY: International Licensing of Small Modular Reactors (SMRs)

The Cooperation in Reactor Design Evaluation and Licensing (CORDEL) Working Group of the World Nuclear Association (WNA) is comprised of international nuclear industry (including reactor vendors, operators and utilities) experts.

This paper presents the initial concept for the roadmap that can be used as a basis for defining licensing strategies for effective and economical international deployment of SMR technology and the results:

- ***Establish areas for possible international harmonization of licensing requirements and investigating existing economic feasibility studies,***
- ***Establish areas where harmonization could possibly be achieved,***
- ***Identify specific issues related to targeted markets,***
- ***Acts as a tool to gather and disseminate information on SMR technology, with particular emphasis on educating the industry, the governments and the public with regards to the benefits and risks of SMR technology.***

Licensing features that could suit SMRs are "pre-licensing" instruments, and, as a further development of this idea, compartmentalizing licensing elements to reflect SMR characteristics better. Breaking the SMR licensing process down into sufficiently independent "modules" is a key factor, making the assessment more like the technology. Paradoxically, the less overlap in the assessment process, the better suited to the qualities of integral SMR designs that achieve overlapping safety aims and reduce the number of active processes.

On top of this paper we have started drafting our road map, which presents our activities in the near future. Some aspects have been identified and work has already started. We will be giving an exclusive introduction to this new focus in our presentation at the 5th Annual Small Modular Reactor Summit 2015.

What do you believe will be the energy market conditions necessary in Europe to make SMRs an economically viable technology?

Challenge is the system in many European countries, where renewables are heavily subsidized. UK has taken this way also in nuclear, supporting nuclear industry efforts. We believe that in a market driven system nuclear could be much more competitive, but we have to understand and adapt into the new energy system. Combining SMRs with renewables and optimizing the energy production system across different clean energy production methods will be something to study in more detail. This kind of combination (with minimal CO2 emissions) can enable nuclear growth in the future (even in Europe).

The Next Steps

In just a few weeks Kristiina and the WNA CORDEL SMR Group will meet at the **5th Annual Small Modular Reactor Summit 2015 (April 14-15, Charlotte NC)** to address a global gathering of the nuclear industries most influential nuclear executives including the likes of **EDF, Exelon, PSEG, B&W, Ameren, IAEA, US DOE, NRC, Areva, GmP, Terrestrial Energy, Mitsubishi, CNNC and more.**

Her presentation, titled *'Facilitating International Licensing for Small Modular Reactors'* will allow all delegates to:

- Gain insight into the WNA perspective of benefits to be reaped by establishing broad licensing principles
- Understand the difficulty of pursuing an SMR design export strategy without broad international design acceptance, and examine innovative new approaches that will streamline the licensing process for SMR technologies
- Assess opportunities to reform how regulatory bodies could cooperate to allow for easier integration of SMR technologies within multiple sovereign states in order to gain clarity over efforts to increase the export potential of various reactor designs

By moving beyond a mere technical discussion on reactor designs, Nuclear Energy Insider is proud to provide a strategic focal point for senior nuclear executives that will determine vital solutions to the chief economic and licensing challenges facing the global SMR and Advanced Reactor industry.

Just some of the unique opportunities on offer at this year's summit includes:

- **Fitch Ratings & Aberdeen Asset Management** are to provide unprecedented analysis of a first-of-a-kind SMR financing proposal, and offer valuable insight to the conditions they need to see met before they support the very first SMR construction loans
- The Director of the **UK Government's SMR Feasibility Study** will walk through the key takeaways from their leading review allowing you to evaluate the lucrative IP opportunities available as non-US organizations begin to establish complex SMR supply chains
- For the first time the **Chief of SMR Licensing Branch, NRC** is due to give an exclusive announcement on their progress towards a clear and predictable regulatory framework through 2015!
- **Intimate Co-Generation Workshop** - Engage with our key executives from **NGNP Alliance, UK Energy Technology Institute, Idaho National Lab, and Europe's Nuclear Cogeneration Industrial Alliance** within unprecedented roundtable sessions that will allow you to unlock new opportunities for SMRs in Integrated Co-Generation and Hybrid Energy deployments
- **Exclusive IMSR Workshop hosted by Terrestrial Energy** - Get to grips with the latest developments in the Gen IV Reactor arena, and understand the real economics behind on of the SMR industry's most exciting developments

Just some of the attendees already registered include:

Kerr Jeferies
Senior Industry Analyst
Nuclear Energy Insider

+44 (0) 20 7375 7565

kjeferies@nuclearenergyinsider.com

Make sure you keep up with the most exciting developments in SMRs by downloading the exclusive brochure here