In October 2015 the UK’s respected Chatham House think-tank published a report that drew some worrying conclusions about the civil nuclear industry. It said many in the sector do not fully understand the risks posed by hackers and the industry needs to be “more robust” on taking the initiative in cyberspace and funding effective responses to the challenge. The industry does not seem to be prepared for a large-scale cyber security emergency and needs to invest in counter-measures and response plans, the report said. It warned that developing countries are “particularly vulnerable” to cyber-attacks at nuclear facilities. The authors should develop guidelines to measure cyber security risk, including an integrated risk assessment that takes both security and safety measures into account. All countries with nuclear facilities should adopt an effective regulatory approach to cyber security e.g. on the basis of IAEA guidance.

From Qualification Design to Training Design Using ECVT Principles

Mihail Ceclan and Franck Wastin | Page 303

The Joint Research Centre of European Commission was designated in 2009 as Operating agent of European Human Resources Observatory – in Nuclear (EHRO-N). EHRO-N identified the nuclear sector’s major challenges: to fill-in the 30 % gap between HR demand and supply in decommissioning and to adapt nuclear E&T system to comply more to the labour market demands. The process of nuclear training system adaptation to the labour market needs is based on the design of the flexible qualifications (unit based qualifications) using European Credit system for Vocational Education and Training (ECVET) principles. The process of ECVET implementation in the nuclear energy sector is ongoing since 2011 and is based on the strategy and road map developed by EHRO-N. The current paper presents the latest developments on the designing of training programs based on exit outcomes.

Overview of Nuclear New Build Projects and Global Perspective

Jean-Pol Poncelet | Page 303

Nuclear power is an important source for electricity production in Europe: today 131 reactors are operated in 14 EU Member States, delivering 28 % of the European power and one half of its low-carbon electricity. The turnover of the sector is about 70 billion € and there are about 800,000 highly qualified jobs. Worldwide the capacities of nuclear power are extending. New build activities are moving to the Eastern countries. Today, the whole electricity market in Europe is characterised by uncertainties for all investments due to political market interventions. A common European energy policy does not appear to exist.

The Climate-problem: Evaluation After the Paris-Agreement and the Marrakesh-Conference

Eike Roth | Page 307

The Paris-Climate-Agreement came into effect on November 4th 2016. Still, the contradiction in this agreement – ambitious goals and (presumably) inadequate commitments – has persisted. Also in agreement – ambitious goals and (presumably) the Paris-Climate-Agreement came into effect on the Marrakesh-Conference.

Nuclear Phase-out in Switzerland: Rationality First!

Tobias Leidinger | Page 313

Just a few months ago, the Swiss voters have rejected the initiative of the Green Party to accelerate the nuclear phase-out in Switzerland with an 54% majority. Once again, it becomes clear that in Switzerland on issues of energy policy rationality and not ideology is leading. With their vote against an accelerated nuclear phase-out, the Swiss citizens underlined that they have no sympathy for radical, ideologically proposals for solutions, which on closer inspection are expensive, risky and immature. The majority has understood that the extensive expansion of renewable energies and power grids is burdened with numerous risks and uncertainties.

Estimation of the Ripple Effects on a Regional Community of the Formation of the Nuclear Energy Science Complex in Gyeongju

Byung-Sik Lee and Joo Hyun Moon | Page 314

Korea has developed advanced nuclear technologies, including those for future nuclear energy systems and the safe management of spent nuclear fuel, and is about to make a decision as to whether to make a massive investment in the development R&D for commercialization of them. There is no area large enough to accommodate all the development R&D-related facilities together at Korea Atomic Energy Research Institute (KAERI) to perform the development R&Ds. KAERI seeks solutions to the space problem, which includes the construction of a nuclear energy science complex (NESC). Gyeongju is one of the potential sites. This paper study estimated the ripple effects on the regional community if the NESC is to be formed in Gyeongju using inter-regional input-output analysis. The estimation shows that the ripple effects to the regional community of the formation of the NESC in Gyeongju would be 1,086,633 billion Korean Won (KRW) for regional production inducement, 455,299 billion KRW for value-added inducement, and 9,592 persons for employment inducement.

The Long Path to a Disposal for High Radioactive Waste – A New Approach for a Better Understanding of Processes and the System in a Whole – Part 3

Karl-Heinz Lux, Ralf Wolters and Juan Zhao | Page 317

A new conceptual-configurative approach and a new simulation tool for the development of an improved process and system understanding for HAW disposal systems – without and with direct long-term monitoring are presented and discussed. With regard to the final repository development, a retrievability of the heat-generating high-radioactive waste during the storage phase and a general recoverability during the first 500 years after closure of the repository in the post-closure phase are required. Both for the monitoring of the repository during the storage phase as well as thereafter, a direct monitoring of the storage horizon could be implemented as an alternative to an indirect monitoring.

Reactivity Feedback Coefficients Pakistan Research Reactor-1 Using PRIDE Code


Results of the analyses performed for fuel, moderator and void’s temperature feedback reactivity coefficients for the first high power core configuration of Pakistan Research Reactor – 1 (PARR-1) are summarized. For this purpose, a validated three dimensional model of PARR-1 core was developed and confirmed against the reference results for reactivity calculations. The “Program for Reactor In-Core Analysis using Diffusion Equation” (PRIDE) code was used for development of global (3-dimensional) model in conjunction with WIMS/D4 for lattice cell modeling. Values for isothermal fuel, moderator and void’s temperature feedback reactivity coefficients have been calculated. Additionally, flux profiles for the fiveenergy groups were also generated.

Time for Nuclear to Hold its Nerve at this Pivotal Time for the Industry

John Shepherd | Page 243

Recent weeks have been tough for the world’s nuclear energy industry. The nuclear industry has seen setbacks before. And it is the nature of this inter-connected global industry to find itself in the international media spotlight when “bad news” strikes. The task for the industry now is to pick itself up and face the economic challenges head-on. As one English proverb notes, “fortune favours the brave”.

Nuclear Power Plant Operation 2016 – Part 1

Editorial | Page 344

A report is given on the operating results achieved in 2016, events important to plant safety, special and relevant repair, and retrofit measures from nuclear power plants in Germany. Reports about nuclear power plants in Belgium, Finland, the Netherlands, Switzerland, and Spain will be published in a further issue.