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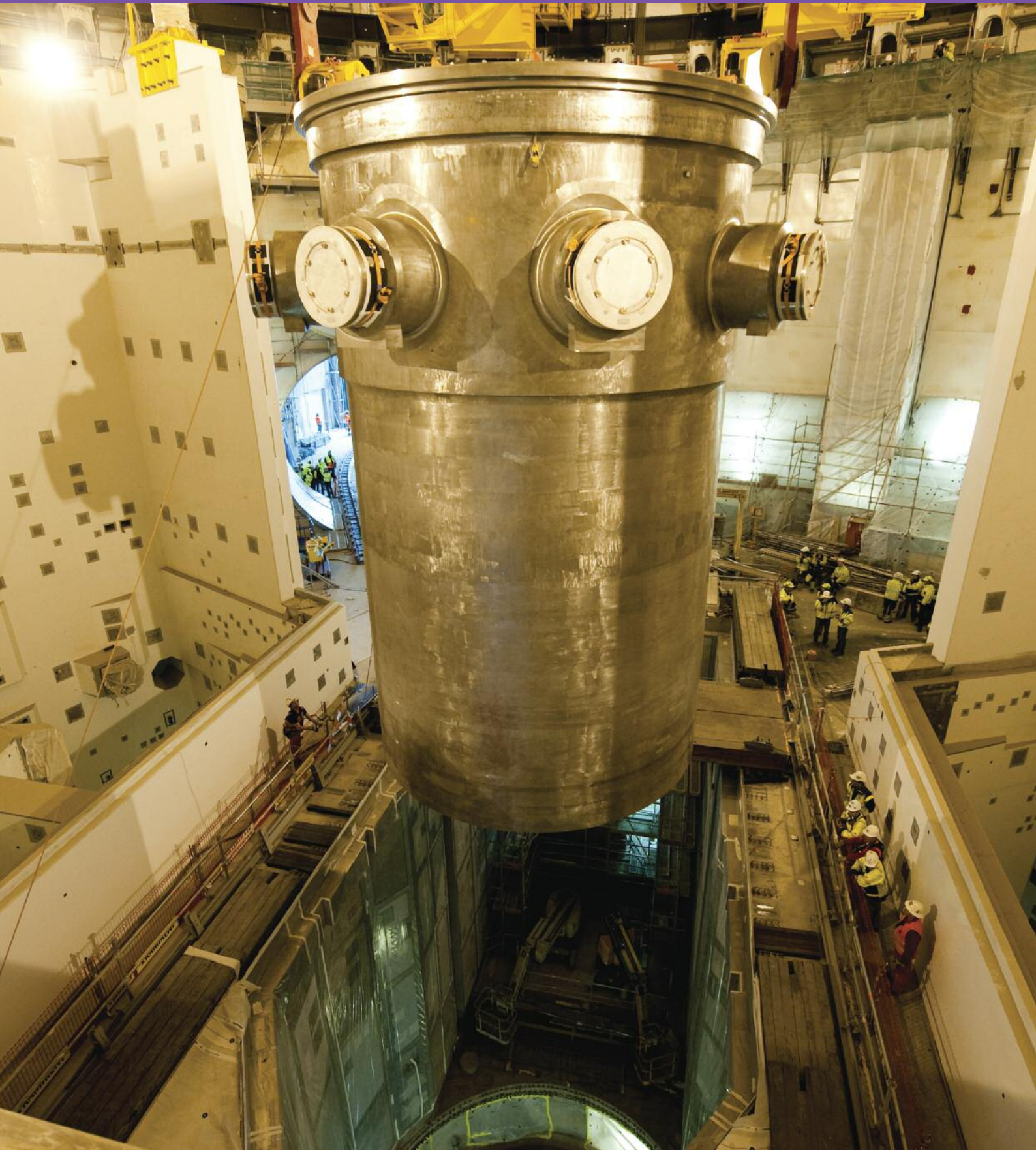
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New nuclear books why not more positive?

Two recent histories, although rigorous, fail to give as much attention to the civil nuclear power industry as to the admittedly unpleasant, but now largely past-tense, nuclear arms race. Their focus on weapons exaggerates the risks of nuclear material trafficking.

It is not surprising that the enhanced interest in uranium and nuclear power over the past few years has already led to an increasing number of books covering nuclear issues. All the news coverage of Iran and North Korea has put a lot of focus on possible weapons links which, at least in passing, threatens the advancement of the civil industry (see last month's comment, pp10-11). The fears expressed in such publications can be seen as largely groundless and the tool of a virulent anti-nuclear establishment. Indeed, it goes as far as that, as it is easier to stoke up fears of death and destruction in people's minds than deny them. The fears unfortunately also tend to infiltrate books which are focused either more generally on nuclear power as a whole or in part.

Typical of this are two relatively recent books, *Uranium: War, Energy and the Rock that Shaped the World* by Tom Zoellner (ISBN 978-0670020648) and *In Mortal Hands – a Cautionary History of the Nuclear Age* (ISBN 978-1596916173) by Stephanie Cooke. Both are certainly well worth reading and in many ways excellent: very well-written, with deeply-researched content (in both cases bringing forward some new information) and some interesting deductions. Both, however, suffer from a similar flaw, which may partly be due to them being essentially histories. This is that the weapons link since 1945 tends to predominate and this clouds understanding of where the civil industry stands today and how it is likely to progress. This may not be surprising, as tales of possible death and destruction are likely to sell more books than an account of several hundred nuclear power plants quietly and largely unobtrusively providing electricity to the contented masses. Yet remarkably both books completely ignore the development of non-power aspects of nuclear technology since the Atoms for Peace programme in the 1950s, and then misunderstand the role of the International Atomic Energy Agency (IAEA) in this and the wider nuclear world.

Tom Zoellner is the author of an excellent book on the world diamond business (*The Heartless Stone*), and has adopted a similar model here, tracing the history, visiting many of the key mining locations and talking to key people. For the offices of De Beers Central Selling Organisation with sightings of the key gemstones, substitute the offices of the World Nuclear Association with its bust of Homer Simpson. This approach actually works very well; the best part of the book is the account of the two uranium rushes in the post-war period, first in the arid west of the United States and second in what were essentially slave labour gulags in the former Czechoslovakia and East Germany. Both were motivated by the same feverish demand to gain as much uranium as possible for two insane arms races, but while one was founded on private enterprise—fathers and sons going prospecting at the weekend in something resembling the California gold rush—the other involved the enforced direction of a large and unfortunate labour pool. Both have left a bad environmental legacy. Although not bad enough to be likely to lead to the curtailment of many lives, they are sufficiently bad to prompt



by Steve Kidd

major clean-up operations (particularly at Wismut in Germany, although a lot of comparatively minor damage indeed still needs to be rectified in the United States) [see also *NEI* July, pp12-17].

Moving closer to the present day, Zoellner's travels take him to both Australia and Niger, today both major uranium countries with significant plans for future expansion. The tale continues at a breathless pace, with encounters with some of the great characters in the Northern Territory of the former and with rebel tribesmen set on kidnap in the latter. The reasons behind why Australia has easily the best uranium resources in the world but is now only the number-three producer (and possibly heading even further down the list) are touched upon, as are the issues lying behind any mining operation (not just uranium) in a poverty-stricken developing nation. The

big weakness of the book only becomes obvious as we move towards today. All the coverage of the arms race, the demand for uranium and how this was satisfied in an unsatisfactory way (from today's perspective) is fine, but what about the civil nuclear industry? Its history, indeed coming out of the military programmes, gets cursory coverage, and the treatment of the mooted nuclear renaissance is facile. To visit Yemen as an example of a prospective nuclear nation is patently ridiculous. Although the United States and Mongolia provide attractive locations for another uranium boom, the sudden excitement of 2007 (when the price rose to over \$130 per pound) has evaporated. Now, the true boom is happening elsewhere in many smallish in situ recovery (ISR) mines in Kazakhstan, elsewhere in Africa (Namibia and Malawi) and, eventually, will come to the traditional, and largest, producers in Canada and Australia. The massive Chinese nuclear programme gets scarcely a mention, in common with India. It is convenient for those attempting to cast aspersions on the future of nuclear to concentrate on the likely new nuclear countries (up to 60 or 70 now, according to the IAEA). In fact, even a cursory analysis will reveal that probably 95% of the new reactors to be commissioned by 2030 will be in existing nuclear countries and most of these in nuclear weapons states, either recognised under the Treaty on Non-Proliferation of Nuclear Weapons (NPT) or tacitly, in India.

Although very little uranium is needed to create the radioisotopes used in the various non-power applications of nuclear, particularly in medicine and agriculture, to ignore them is inexcusable; they are an important part of the nuclear sector today and going forward. Describing the IAEA as a promotional body for nuclear power is so inaccurate it would be very funny, were the superb efforts of its employees in developing understanding and application of nuclear in many developing countries not so sadly unrecognised. To malign a substantial and largely successful international programme with the image of the legacy of an abandoned research reactor in the Congo is patently unfair.

Another issue, shared by Stephanie Cooke's book, is the undue attention paid to the possibilities of trafficking in nuclear materials.

“The spectre of terrorists and failed states creating workable nuclear devices is essentially the stuff of science fiction and should be consigned to James Bond movies”

Rather like the disproportionate amount of attention paid to the arms race instead of the boring civil nuclear programme, it is a good yarn, yet amounts to very little in reality. On the one hand, we have billions of dollars spent on arms programmes which have arguably had little overall influence on the world after the excitement of two bomb explosions in 1945 (now before about 90% of the world's current population was born). But they make an untenable connection between the performances of Robert Oppenheimer and his team of the brightest scientists in the world, and the 'bad guys' who may steal materials from an obscure and ill-guarded nuclear facility in the former Soviet Union with the aim to create another big bang in 2010. (Or if that sounds too incredible, they aim to make a 'dirty bomb', which is actually not really a bomb at all). Although there are plenty of minor incidents of trafficking, logged in great detail on a public IAEA database, and the usual talk from the score-keepers that they only pick up a small percentage of total transits (in common with those intercepting dangerous drugs), it all amounts to very little. Although more resources are needed, the net on fissile material trafficking has tightened considerably through many programmes in recent years. Of course continued vigilance is necessary, but the spectre of terrorists and failed states creating workable nuclear devices is essentially the stuff of science fiction and should be consigned to James Bond movies.

Turning to Cooke's book in more detail, the writing is again excellent and her skills as a journalist (latterly with one of the industry's newer newsletters) come to the fore. Her tone is, however, somewhat pessimistic on the possibility of nuclear power ever fulfilling the promise it has held out since the 1950s (the non-power applications again are studiously ignored). A lot of this depends on one's personal mind-set and values. We know that strongly anti-nuclear people see facts that nuclear advocates put in front of them in a totally different light. One can certainly view the history of nuclear as a cycle of expectation, breakthrough, mishap and false promises, as Cooke does, and there is plenty of good material out there to inform such a view. The slowdown in nuclear growth in the 1980s and 1990s had to do with lots of factors apart from the Three Mile Island and Chernobyl accidents, but these certainly mean that the jury on the mooted nuclear renaissance today is still out. Atoms for Peace in the 1950s undoubtedly helped many countries set out on the nuclear arms race. But what is much more significant are those countries, including Argentina, Brazil, South Africa, South Korea and others, who turned away from it. Safeguards on nuclear materials, as we've seen in the case of Iran, cannot be totally watertight in the face of a significant sovereign nation that appears determined to get the Bomb. But there are very good reasons why nearly all countries will not go down this route. Both the materials required and the technology involved are still very difficult to acquire and master.

Lots of people undoubtedly worry about possible nuclear proliferation with expanded civil nuclear programmes and also get concerned by issues such as radioactive waste and possible radiation exposure. Even when informed that high-level waste is negligible in magnitude and managed very safely and securely today, or when told that you are more likely to receive a higher radiation dose by living near a coal generating plant or from hospital procedures than from nuclear power, some people will still not easily sleep at night. As *In Mortal Hands* correctly and articulately describes, a lot of the history of nuclear is not so good, whether in terms of the environment or economics (two

of the big forces that are prompting more attention to civil nuclear power today). Many of us today share a vision of nuclear power becoming much more like any other industry, and whose best modern practices overcome all of the issues mentioned by Cooke. Still, this vision is an act of faith that has arguably disillusioned many in the past. Nuclear will undoubtedly remain different and governments will always play a significant role through regulatory and planning bodies, but the vision is of a mature technology eventually reaching its potential with thousands of operating reactors globally, rather than today's 438.

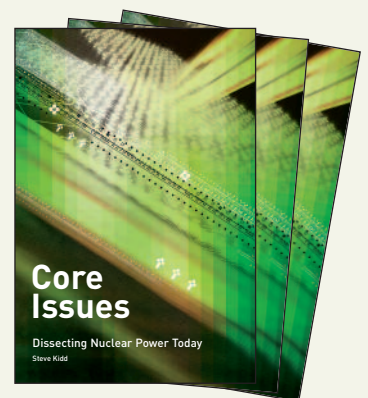
Governments are, however, not the key to the nuclear future. It is really down to the industry itself to get its own act together. The governmental bodies with their crowds of lobbyists around them will continue to back obscure technical fixes and ideas such as GNEP, international fuel banks, repositories and fuel leasing, while the industry is essentially left to get on with the real job. The most important job is to run the existing reactors safely, securely and economically, so their position as cash machines for their owners becomes better understood. Then the next job is to build a new fleet of more standardised reactors at diminishing cost as economies of scale kick in and an international supply chain develops. Meanwhile, the few countries with deep nuclear weapons ambitions will only provide an entertaining sideshow. ■

Steve Kidd is director of strategy and research at the World Nuclear Association, where he has worked since 1995 (when it was the Uranium Institute). Any views expressed are not necessarily those of the World Nuclear Association and/or its members.

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