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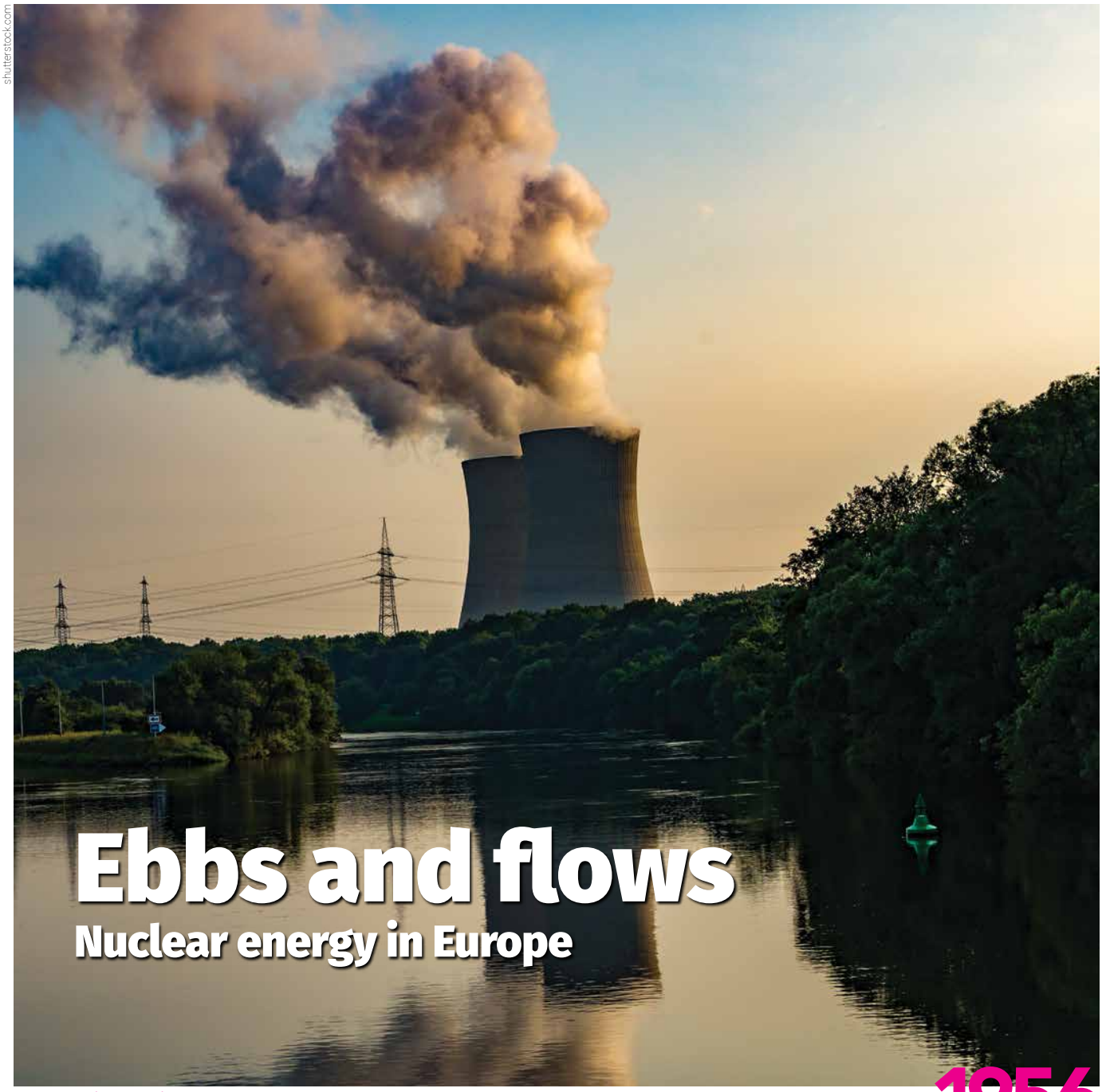

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Ebbs and flows

Nuclear energy in Europe

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Easing the burden

Michael McMahon and **Dan Collier** outline the benefits of NAC Reporter for nuclear material control and accounting

ONE OF THE LESSER KNOWN impacts of Brexit, the United Kingdom's exit from the European Union (EU), is on how that country will track its nuclear materials. For decades, the UK was part of the EU nuclear material control and accounting (MC&A) system, which carefully tracked and accounted for all the nuclear materials associated with the EU country programmes.

UK government planners needed a new nuclear MC&A to track nuclear material according to national and international standards that would be subject to rigorous verification by inspectors and detailed reporting. In the end, they came to NAC International.

In addition to specialising in nuclear material storage and transportation, NAC International has been involved in nuclear MC&A systems for decades.

In the early 1990s, NAC redesigned and operated the US system for tracking nuclear materials, which had to conform to the standards of three different agencies: the US Department of Energy (DOE), the US Nuclear Regulatory Commission (NRC), and the International Atomic Energy Agency (IAEA). For the next 15 years, NAC operated this integrated MC&A system, known as the US Nuclear Materials Management & Safeguards System.

Following NAC's redesign, the system became more efficient, accurate and easier to use. NAC decided to harness its application development and operating experience to develop two versions of a new MC&A commercial software product, NAC Reporter – one for countries and another for nuclear facilities.

One version of NAC Reporter is for countries developing new nuclear energy sectors, for occurrences such as that in the United Kingdom in which a sudden need for an MC&A system arises, or for countries replacing antiquated systems. There is also a version of NAC Reporter designed for nuclear facilities, when the plant either is new or when operators are looking to replace inefficient legacy systems.

Above: **There are strict requirements for tracking nuclear materials**

Meeting reporting requirements

When a country embarks on nuclear energy development, it is confronted with a daunting array of new requirements beyond just building a nuclear plant. The implications of a possible diversion of nuclear materials mean there are extensive, complicated rules that define the precise accounting the country or facility must perform and what detailed reports they must supply to the governing agencies.

To ease this burden, NAC International experts have drawn upon the knowledge and proficiency gained from decades of MC&A system development and operating experience. The latest version of NAC Reporter maximises automation while maintaining a strong focus on ease of use and consistency in its operation.

Automation includes reconciling book inventory and actual inventories of nuclear materials and identifying discrepancies. With this information, the system will automatically identify rule violations and suggest fixes. These features save significant staff time and resources and also ensure accurate accounting of the material.

The USA, Canada, Australia, the European Union and Japan all require nuclear material supplied or used in major equipment supplied by them to be separately tracked and reported, a process called "obligation tracking." NAC Reporter has built-in obligation tracking, making these requirements simple to implement, and it can also add new obligations with the click of a mouse.

The United Kingdom is in the final stages of installing its NAC Reporter system. To date the project is successfully meeting an expedited schedule to ensure that the installation will be completed before 29 March 2019, the anticipated Brexit date.

Saudi Arabia recently selected the state version of NAC Reporter, and another middle eastern country is using the facility version. Kazakhstan, the world's largest uranium producer, is in the process of implementing both the state and facility version of NAC Reporter.

Although there are many standard features, NAC customises each application to meet the specific customer requirements (including customised reports and multi-language capability). As an example, the Kazakh systems operate in three languages: Russian, Kazakh, and English.

Nuclear accounting information is sensitive, and access is tightly controlled. Ensuring the security of the data is essential. To assure data security, users perform rigorous cybersecurity penetration testing of the application before the official rollout of the system. NAC Reporter has passed each such test. ■