The Belgian Nuclear Society's 50-Year anniversary

By Vincent Massaut and Fabio Nouchy

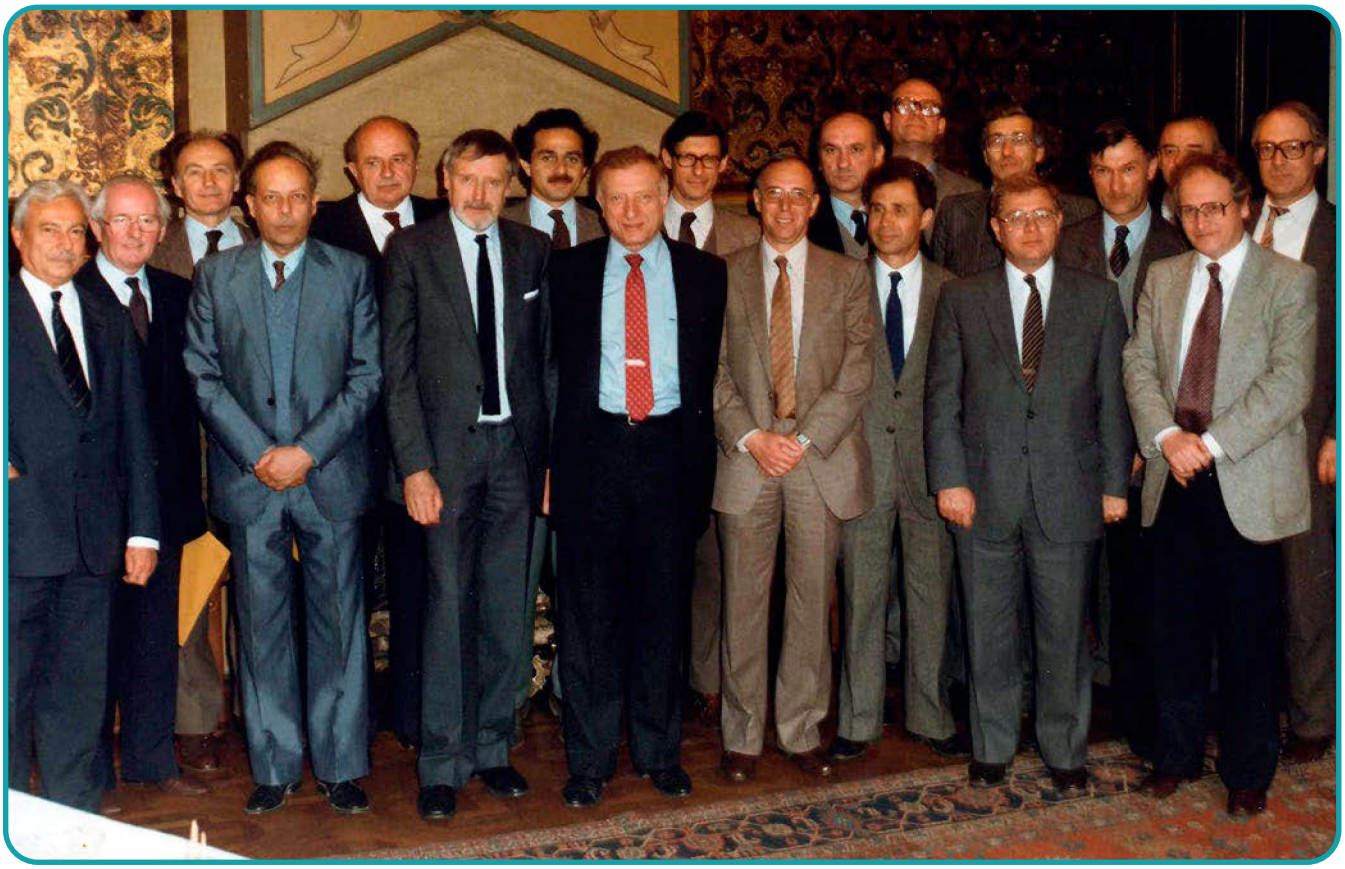
In 1970, a bit more than 50 years ago, then–ANS President Nunzio Palladino gave an evening lecture in Brussels to the newly formed Belgian local section of the American Nuclear Society. It was the seed for what would become the Belgian Nuclear Society, but the story starts even earlier than that.

The past

The Belgian local section of ANS was one of the first ANS national chapters formed outside the United States. The formation isn't very surprising, as Belgium had an already well-developed nuclear industry at that time, dating back to the strong nuclear ties between the countries over previous decades.

It is a well-known story that during the Second World War, Edgar Sengier, the then-director of the Belgian mining company Union Minière du Haut Katanga, shipped very rich uranium ore to the United States. After the war, in return and as part of the Atoms for Peace program, a number of Belgian scientists and engineers were invited to work and study nuclear technology in the United States. This allowed Belgium to construct the nuclear research center SCK CEN, with a one-of-a-kind material test reactor provided by Nuclear Development Corporation of America and the first Westinghouse pressurized water reactor outside of the United States. This was part of the basis for the Belgian and French PWR deployment that started at the end of the 1960s.

During that first Belgian ANS local section meeting, Professor Palladino gave a lecture on nuclear



A gathering of the Belgian Nuclear Society in the early 1980s with ANS representative and President Milton Levinson, 1983-1984 (front row center).

safety, and it was followed by a small cocktail. It was the start of a tradition that is still the basis of the Belgian Nuclear Society activities: Every fourth Thursday of the month, an evening lecture is organized on a subject of current interest with a national or international lecturer, followed by a cocktail.

After the early years of the Belgian local section, the group gained increased European industry contacts in the fields of fast neutron reactor studies, fuel fabrication, reprocessing, and even nuclear power plant construction. This collaboration led to the European Nuclear Society, and the Belgian ANS branch was one of its founding members in 1975.

However, by 1980, the Belgian local section wanted to speak out on nuclear-related matters within Belgium. Because an ANS local section couldn't speak on behalf of the American Nuclear Society, the Belgian section continued separately as the Belgian Nuclear Society, still being "affiliated" with ANS. While the mission of the BNS today remains to promote the advancement of science and engineering related to peaceful applications of nuclear energy, and while the BNS disseminates the above-mentioned information, the BNS doesn't participate in advocacy as an organization. The Belgian nuclear lobby group is the Belgian Nuclear Forum, which became a corporate member of the BNS. Moreover, the Technical Support Organization of the Safety Authority and the Waste Authority are also corporate members. The BNS members work for different stakeholders, such as industry, research, education, and governmental organizations. Given that the BNS values its members and the informal interprofessional relations forged as such, the BNS Executive Committee is charged with maintaining sufficient neutrality. It is a difficult task to guard the thin line between disseminating objective information and advocacy.

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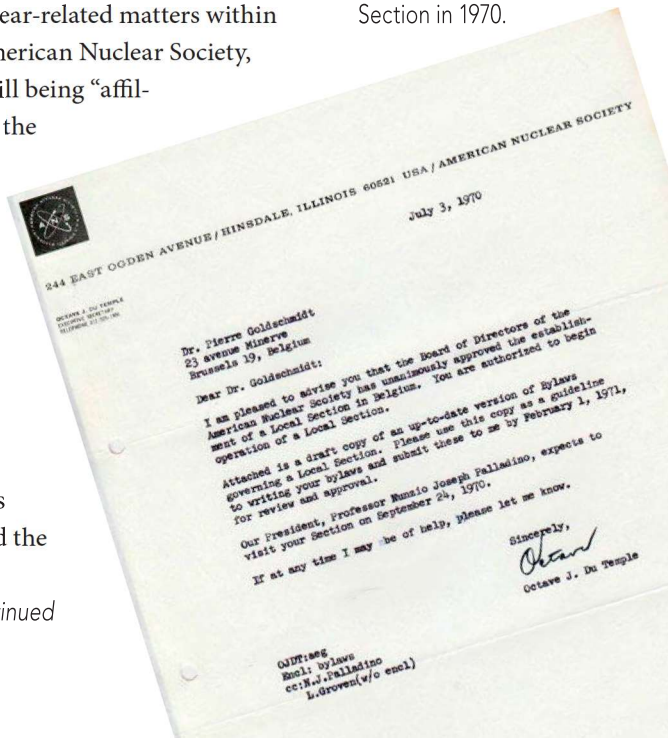
A piece of history: ANS letter approving the establishment of the Belgian Local Section in 1970.



244 EAST OGDEN AVENUE / HINSDALE, ILLINOIS 60521 USA / AMERICAN NUCLEAR SOCIETY

July 3, 1970

Dr. Pierre Goldschmidt
23 avenue Minerve
Brussels 19, Belgium

Dear Dr. Goldschmidt:

I am pleased to advise you that the Board of Directors of the American Nuclear Society has unanimously approved the establishment of a Local Section in Belgium. You are authorized to begin operation of a Local Section.

Attached is a draft copy of an up-to-date version of Bylaws governing a Local Section. Please use this copy as a guideline in writing your bylaws and submit these to me by February 1, 1971, for review and approval.

Our President, Professor Mumio Joseph Palladino, expects to visit your Section on September 24, 1970.

If at any time I may be of help, please let me know.

Sincerely,

Octave J. Du Temple

OJDT:aeg
Encl: Bylaws
cc:M.J.Palladino
L.Groven(w/o encl)

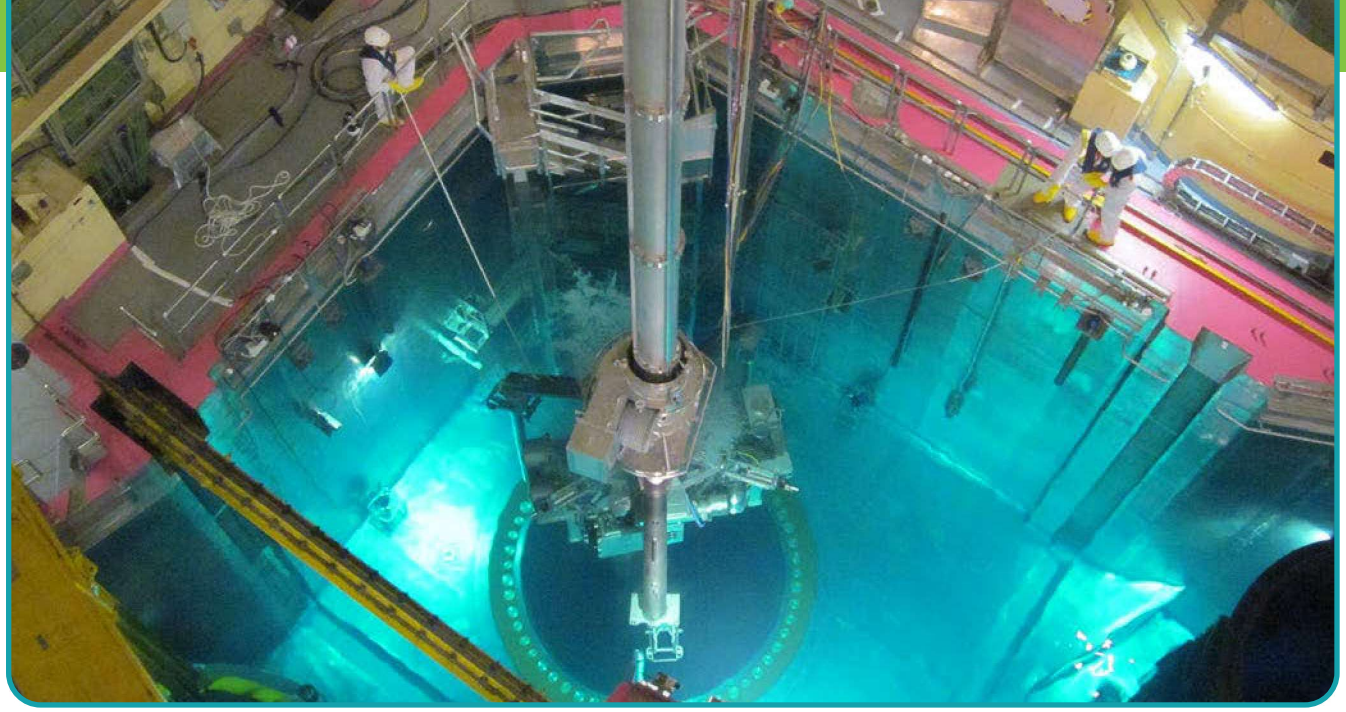
The 1970s and 1980s were the growing golden years of the Belgian nuclear industry. Along one path, there was the "Belgian Nuclear Valley" in the lowlands, housing the Belgonucleaire mixed oxide fuel production factory, the FBFC fuel element production factory, the Belgian nuclear research center SCK CEN, the European Joint Research Center with the Central Bureau of Nuclear Measurement, the joint European Eurochemic reprocessing plant, and the Belgian temporary waste storage site. At the same time, there was the successful construction of seven nuclear reactors operated by Electrabel ENGIE on two sites and supported by the engineering firm Tractebel, with an original installed capacity of about 5.5 GWe, allowing Belgium to phase out electricity production from oil.

Furthermore, Belgium also developed an important medical nuclear industry. A dedicated production facility for radioisotopes—the National Institute for Radioelements (IRE)—was founded close to Charleroi, about 50 km (31 mi) south of Brussels, and IRE remains one of the most important suppliers of radioisotopes worldwide with more than 25 percent of the total molybdenum-99/technetium-99m market. A large fraction is also produced nearby via irradiation in the BR2 reactor of SCK CEN. Plus, cyclotrons for medical applications have been developed and successfully marketed by Ion Beam Applications (IBA) in Belgium, which would specialize later on in proton therapy—although Belgium had to wait until just this past summer before having its first proton therapy center from IBA.

Given the important presence of the medical nuclear industry, and the many innovations made by this industry, the BNS is proud to have them among its corporate members. It is for that reason that nuclear medical subjects are addressed on a frequent basis during BNS evening lectures. The latest European Nuclear Young Generation Forum was also organized recently to highlight the important symbiosis between the nuclear industry and the medical industry, expressed by the main theme, "From half-lives to better lives."

While the number of students in the nuclear sector declined in the 1990s, leading to the formation of the national Belgian Nuclear Education Network program, young nuclear professionals also met and decided to assemble as part of the BNS. These youngsters played an important role in the creation

The proton therapy installation at Leuven's University Hospital, supplied by Ion Beam Applications. Photo: UZ Leuven



A reactor pressure vessel inspection of the Doel-3 reactor at the Doel nuclear power plant, where indications have been discovered. Doel-3 is scheduled for decommissioning in 2022. Photo: Engie Electrabel

of the International Young Nuclear Conference organization. The Young Generation organizes regular technical visits to the many Belgian installations, including, for example, the Westinghouse pump workshop and the spent fuel container construction site at Atelier de la Meuse, but also international visits to, for example, the European subatomic research center CERN and the future fusion facility ITER. These international visits couple technology and culture, often resulting in long-lasting international friendships.

At the beginning of the 2000s, the Belgian government decided on a nuclear phaseout, not allowing any extension of power plant lifetime beyond 40 years. The decision was overturned in 2015 for the three oldest units, which were granted an extended operation period of 10 more years in light of possible electricity shortages. During the same period, the so-called reactor pressure vessel indications at the Tihange-2 and Doel-3 plants were detected. The operator Electrabel, together with Tractebel and other Belgian specialists, such as SCK CEN, Laborelec, and the original supplier Framatome, demonstrated that these indications were hydrogen flakes and didn't pose any threat to the pressure vessel integrity. Within this framework, the BNS organized a workshop to provide the scientific and technical community with in-depth information about this demonstration. Such annual workshops continue to be organized on different current topics, ranging from the BR2 research reactor modernization effort to a friendly contest challenging the Young Generation to present a reactor design.

The present

Today the BNS counts approximately 400 members, with a healthy balance between senior and junior members. Many interesting Belgian projects are ongoing, such as the recovery of uranium from the highly radioactive residues of the irradiation target extraction process; the development of new medical radioisotopes for theranostics; and the MYRRHA project, a lead-bismuth–cooled accelerator-driven system that will try to demonstrate the potential transmutation of minor actinides. As such, the BNS still finds many interesting national topics for its evening lectures. Brussels remains well located close to the European institutions, with easy connections to Belgium's neighboring countries. This unique location gives the opportunity to invite other European speakers to provide more information on the different policies that are being developed, as well as informing Belgians about ongoing projects abroad.

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The BNS Young Generation delegation during a visit of ITER, within the large component assembly hall.

Also, the COVID-19 crisis set the BNS on the path to virtual conferences. Those virtual meetings have thus far shown to be an excellent tool to bring together employees from all Belgian institutions, unhindered by the congested roads to Brussels.

The BNS is also lucky to have a very active Young Generation that is continuously renewing our ways of communication with a more accessible website (bnsorg.be) and our first steps on social media.

The future

The future of both the industry and the BNS is rather uncertain. As of October 2020, Belgium has a new government. That government not only reestablished the world record on government negotiations, it has also confirmed the nuclear phaseout law, despite knowing that nuclear energy still contributes about 50 percent to the country's total electricity production. However, if in 2021 the future security of supply is not guaranteed, the government agreement foresees a possible long-term operation for the most recent nuclear units.

No matter what, the Belgian nuclear operators will have to decommission at least five units starting from 2022, which could also lead to interesting BNS sessions on the challenges posed by defueling, dismantling, and the operation of surface disposal facilities.

With a reduction of the activities within the Belgian nuclear industry, the BNS might start to face the challenges currently faced by many other nuclear societies worldwide. But with the participation of the Belgian Royal Military Academy in fusion research, the Belgian industry's interest in space applications, and innovation in the context of the energy transition with small modular reactors, the BNS will not soon run out of interesting national subjects to present to its members.

The future, however, is still unwritten! It is certain that the BNS will celebrate its 50th anniversary in person once the restrictions on the spread of COVID-19 allow it. We will participate in the, albeit postponed, ANS NURETH 2021 conference in Brussels. We will continue to share know-how within the sector using the successful formula of our evening lectures. And we hope that 25 years from now, we can report more on the continuation of our radiant history.

Vincent Massaut is the current president of the Belgian Nuclear Society, and Fabio Nouchy is the current BNS Young Generation president.