

Safety upgrade at Hungarian Nuclear Power Plant in Paks (Hungary)

VISOLA and SCHOTT supply enhanced Electrical Penetration Assemblies for Nuclear Power Plant

Hungary's only Nuclear Power Plant (NPP) located in Paks plays a significant role in the country's economy. The NPP, which houses four nuclear reactor units, accounts for more than 40 percent of the energy that the nation consumes. According to the International Atomic Energy Agency (IAEA), Paks NPP has an operational safety record on par with the best in the world. To raise this to an even higher level, 347 Electrical Penetration Assemblies (EPA) have been replaced. The new EPAs manufactured by VISOLA Ltd. ensure the highest safety thanks to the glass-to-metal sealed feedthroughs from SCHOTT Electronic Packaging GmbH.

Paks NPP is extremely important to the Hungarian electric power market. After all, it helps ensure that consumers have access to a reliable and affordable supply of safe and environmentally-friendly electricity. To achieve this, all four units of the power plant that were put into service between 1982 and 1987 are constantly being modernized. This effort has certainly paid off: IAEA awarded Paks the highest scores for its safety performance.

"The Soviet designed VVER-440 type, V-213 model, second generation pressurized water reactors are still functioning reliably. This can be attributed to the skilled maintenance work and a series of measures implemented for improving the level of safety," says Mr. István Mittler, Communication Director for Paks NPP Ltd. "However, in addition to the reconstruction of the reactor protection system, a lot of obsolete equipment had to be either replaced or refurbished," he adds.

Safety upgrade to enable extension of service lifetime

As agreed to with the IAEA, the Hungarian government decided to upgrade the infrastructure of the NPP even further. The goal is to lay the foundation for an extended service life of 20 years, in addition to its original 30 years of operation. This means that several of the NPP's components need to be replaced, especially safety-critical parts like the Electrical Penetration Assemblies (EPAs), which were insulated with plastic that has since aged. EPAs from VISOLA in Hungary that contain glass-to-metal sealed feedthroughs manufactured by SCHOTT Electronic Packaging in Germany, offered the ideal solution.

"We prefer these products over other imported EPAs because they combine reliable feedthroughs with gamma screening and other constructional components required by our power plant," explains Mr. Géza Pekárik, Technical Director of Paks NPP Ltd. "The quality management system of both suppliers also passed our qualification standard. There was no defective product in the shipments and no failure occurred during operation. Both the electrical and sealing properties of the VISOLA-SCHOTT EPAs are excellent," he notes.



PAKS

This case study by [Visola Electric Insulation Technology Ltd](#) illustrates the use of SCHOTT's EPAs in the PAKS NPP (Hungary) since 1995 with no incidents of failure.

Glass-to-metal sealed penetrations with gamma screening

"We developed a complete family of EPAs based on these reliable glass-to-metal sealed feedthroughs that are equipped with gamma screening in order to be able to meet the rigid requirements of the VVER-440 type reactors at Paks NPP," says Dr. Endre Zelenyánszki, Managing Director of VISOLA Ltd. "The development of the design, manufacturing technology and quality assurance system took four years. Domestic research laboratories were also involved in the testing of the design and qualification of the products," adds Mr. Habib Naderi, Technical Adviser for VISOLA Ltd.

SCHOTT
glass made of ideas

Safety upgrade at Hungarian Nuclear Power Plant in Paks (Hungary)

VISOLA and SCHOTT supply enhanced Electrical Penetration Assemblies for Nuclear Power Plant

“Glass-to-metal sealed penetrations provide pass-through for power, control and instrumentation cables to the thousands of instruments, control panels, electric motors and many other electric and electronic devices in a nuclear power plant,” explains Dr. Oliver Fritz, Technology Expert from SCHOTT Electronic Packaging. “They maintain the pressure boundary integrity of the containment structure for periods well in excess of the 60 years design lifetime and enhance the safety levels of the nuclear reactor,” he concludes.

“The installed EPAs will definitely be able to meet the requirements of the extended service time,” Mr. Pekárik says. “Uninterrupted operation of the existing four units over the next two decades will also serve as proof of concept for the construction of new reactors. According to the plan currently under preparation, two new units are to go into operation between 2020 and 2025 and thus provide the cornerstone for the national strategy on minimizing risks with respect to the country’s power supply,” he concludes. VISOLA Ltd. develops and manufactures electrical cable penetrations (EPAs) and trades with special cables and cable accessories for application in nuclear power plants (NPPs).

The company has a certified quality assurance system in force to control all activities. VISOLA’s electrical penetration assemblies fully comply with the strict quality and safety regulations of the nuclear industry. Established in 1991, the company supplied the former Research Institute of Electrical Industry with medium voltage EPAs for cables of primary loop pumps. 96 pieces have been in operation at the Paks NPP for two decades.

A complete family of EPAs equipped with gamma screening was developed to meet the special requirements of the VVER-440 type reactors at Paks NPP. Between 1995 and 2010, VISOLA Ltd delivered 347 EPAs for Paks NPP Ltd. So far, there have been no failures or complaints. For more information: <http://visola.hu/en>

As a business unit of the international technology group SCHOTT, Electronic Packaging (EP) is a leading manufacturer of housings and other components for the reliable, long-term protection of sensitive electronics. The core technologies are glass-to-metal and ceramic-to-metal sealing, thermal sensing components as well as a variety of cutting-edge specialty glass competences.

With 1,500 employees at five production locations and several competence centers around the world, local customer support and co-developments for individual packaging solutions are at the heart of the business, serving the world’s leading manufacturers in the automotive, data- and telecommunication, sensors and semiconductors, consumer electronics, dental care, home appliances, laser as well as security and tracking industries.

For more information: www.schott.com/epackaging