
Preface

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Biographical notes: Vladimír Slugeň has been working at the Department of Nuclear Physics and Technology, Slovak University of Technology – Bratislava as Researcher and Senior Lecturer since 1985. He gained his PhD in Built Nuclear Equipment (1993) and degree of Professor in Nuclear Power Engineering (2005). His main fields of research and teaching activities are the operation and safety of nuclear power plants and the application of spectroscopic methods in the investigation of materials used in nuclear industry. He has about 100 original papers in scientific journals and international conferences. In 2004, he was elected as President of the Slovak Nuclear Society.

At the beginning of 2007, a total of 437 nuclear power plants were operational in 31 countries for energy supply, including 49 units of VVERs. A further ten VVER units were under construction and 11 were for decommissioning. Three basic types of this pressurised water-cooled and moderated reactor are operated in Central and Eastern Europe: the VVER-440/V230, the VVER-440/V213 and the VVER-1000. Operating such a large amount of units requires huge experience and knowledge. Since 1963 (when the first VVER-210 prototype was put in operation) up to now (when VVER-1000/V466 is constructed and offered on the world market), there has been no nuclear accident (INES > 3) in about 1000 operational reactor-years. The robust design and relatively simple operation currently supported by new I&C techniques make a good basis for the safe use of these units.

Although the VVERs represent less than 10% of the worldwide nuclear capacity, in the Central and Eastern European region they have high importance in that they produce between 6% and 48% of the electricity of the owner countries. This region is in a very difficult economic situation, as the GDP decreased in every country by between 20% and 50% in the 1990s, and the countries mostly do not have sufficient financial resources to replace these reactors in the foreseeable future. This situation caused several national and international programmes to be set up in order to check and enhance the safety of these plants and to start a systematic life management programme in every country.

Despite great efforts and investment, as well as good operational and safety features and history, countries joining EU after 2004 decided to close their VVER-440/V230 units, more for political reasons than insufficient safety standards. Instead of frustration, an active and constructive approach is necessary. It is obvious that there was not enough

knowledge and information about VVER design and safety in 1992 at the Munich G8 meeting, where it was decided that "... VVERs are not able to be upgraded to world safety standards for reasonable costs". With the aim to avoid such misunderstanding in the future, the safety design, features and practices have to be open, transparent and well presented for the global nuclear community.

The situation in the nuclear (VVER) safety research has significantly changed in the last 15 to 20 years. In contrast to the past, the national institutions have increased their responsibility in the nuclear area. Independent nuclear regulatory authorities were created in many countries. State or private research organisations decreased their numbers of employees, but increased their quality and competence. Many of them are currently active worldwide with excellent results.

Participation in the EC Sixth Framework project Coordinated Action on VVER Safety (COVERS) is one proof of their competence. I personally appreciate COVERS because it is good chance:

- to take inspiration or to inspire other COVERS participants in discussion and common research directed to safety upgrading
- to emphasise that VVER countries have high levels of competence and COVERS is a unique chance to establish international groups of experts competent in the evaluation of VVER safety and lifetime prolongation.

In this Special Issue you can find several papers describing the COVERS project and the main areas of our activities focused on how to increase the safe operation of VVERs. I hope that you will find these papers interesting and useful.