

Special Issue on Innovative Gas-Cooled Reactors

Call for Papers

Innovative gas-cooled reactors, either with a thermal (HTGR) or fast (GCFR) neutron spectrum, are widely considered by academia, research centers, and industry to be among the most promising reactor concepts for the next generation. These reactors are characterized by a fully ceramic core and a noncorrosive coolant (helium or carbon dioxide), which is transparent for neutrons. Due to these characteristics it is possible to have high operating temperatures.

Research and development (R&D) projects are currently under way in many countries from China, European Union, Japan, Russia, South Africa, South Korea to the United States, of which many are cooperating through large international projects, such as the framework programmes of the EU, the Generation IV International Forum (GIF), and the International Project on Innovative Nuclear Reactors and the Fuel Cycles (INPRO) programme of the IAEA.

In terms of safety and competitiveness, the high temperature gas-cooled reactor (HTGR) has very attractive characteristics. It is generally considered to be the most promising candidate at short term and seems to offer at least a partial solution to the growing world energy demand. The operational experience obtained from the HTTR and the HTR-10, in conjunction with the experience already available from other reactors and research projects, constitutes a strong technological basis for the commercial development of HTGRs. Additionally, the fuel cycle flexibility of the HTGR offers the possibility to use this reactor type for the reduction of plutonium and minor actinides stockpiles, as recent studies indicate.

Recently, the gas-cooled fast reactor (GCFR) has also gained the interest of industry and the international scientific community. Due to the positive characteristics common to all fast reactors (the improved sustainability by generation of fuel from fertile nuclides and the possibility for efficient burning of nuclear waste) combined with the advantages of gas coolants (no phase change, and no nuclear or chemical reactions in the core), the GCFRs represent a very interesting prospect for future nuclear technology. Their development takes advantage of the high temperature gas coolant technology arising from the HTGRs.

This widespread interest in innovative gas-cooled reactors from industry to research center and universities is a stimulus for the rejuvenation of the industry, attracting young talents

to our universities to become the scientists and engineers of the future.

This special issue will cover the following topics:

- Design and analysis of advanced (V)HTRs
- Design and analysis of advanced GCFRs
- Industrial and research projects
- Experimental programs and benchmarking
- Fuel and fuel cycles including waste management
- High temperature materials and components
- Safety and licensing
- Economics and scenario analyses
- High-temperature process applications

Papers are invited from experts working in areas mentioned above for publication in the special issue.

Authors should follow the Science and Technology of Nuclear Installations manuscript format described at the journal site <http://www.hindawi.com/journals/stni/>. Prospective authors should submit an electronic copy of their complete manuscript through the journal Manuscript Tracking System at <http://mts.hindawi.com/>, according to the following timetable:

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First Round of Reviews	May 1, 2009
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