



# Science and Technology of Nuclear Installations

## Special Issue on Basic Theory and its Application of Pumps for Nuclear Power Plant

# CALL FOR PAPERS

In a nuclear power plant, various types of pumps are indispensable equipment to provide necessary heat removal, cooling regime, and effluents flow to ensure safe and stable operation of each system in both normal and emergency conditions. Nuclear power plant pumps are not only required to operate under extremely complex conditions to guarantee normal operation for primary and auxiliary systems but also required to meet high standard on safety, reliability, earthquake resistance, and durability for keeping the entire plant safe. Therefore, the design and manufacture of the pump for nuclear power belong to cutting-edge technologies in pump field, and the related scientific problem is the hot and difficult point for research in academic area.

With the continuous development of nuclear power technology, the requirements by the system on pump operational performance as well as reliability and safety are increasing; however, the related theoretical research basis is not mature enough and is facing enormous challenges. Basic theory of pumps in nuclear power plant is involving pump design method, fluid dynamics, thermodynamics, structural dynamics, rotor dynamics, multiphysics coupling mechanics, mechanics of materials, tribology, and many other issues. With the rapid development of numerical methods and advanced experimental technology in recent decades, the research has entered a new phase; more and more complex phenomena can be explained and well treated. This has laid a good foundation for the further improvement of theoretical studies of pumps for nuclear power plant.

This special issue aims at creating a multidisciplinary forum of discussion on recent advances in basic research and application related to pumps for nuclear power plant. The accepted papers will show a diversity of new developments in these areas. This issue accepts high quality articles containing original research results and review articles.

Potential topics include, but are not limited to:

- ▶ High performance hydraulic model design and optimization
- ▶ Design computer codes and validation tests
- ▶ Flow structure visualization within pumps
- ▶ Pressure fluctuation and flow instabilities
- ▶ Multiphysics coupling involved in pumps
- ▶ Flow induced noise and vibration
- ▶ Multiphase flow and cavitation
- ▶ Pumping liquid metals
- ▶ Transient flow at startup and shutdown
- ▶ Rotor dynamics
- ▶ Thermal shock analysis
- ▶ Seismic analysis and resistance to multiple external threats
- ▶ Material friction and wear corrosion
- ▶ Bearings and seals
- ▶ Reliability and life predictions

Authors can submit their manuscripts via the Manuscript Tracking System at <http://mts.hindawi.com/submit/journals/stni/bnpp/>.

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