

TERMS OF REFERENCE

FOR THE TECHNICAL WORKING GROUP ON NUCLEAR POWER PLANT INSTRUMENTATION AND CONTROL (TWG-NPPIC)

The Technical Working Group on Nuclear Power Plant Instrumentation and Control (TWG-NPPIC) is a group of experts from International Atomic Energy Agency (IAEA) Member States that was established to provide advice to the IAEA and support programme implementation, reflecting a global network of excellence and expertise in the areas of instrumentation and control (I&C) and human–system interface (HSI) technologies in nuclear power plants (NPPs).

I. SCOPE

The TWG-NPPIC's scope of work covers all aspects of the life cycle of I&C systems and equipment from feasibility study and design through installation, commissioning and licensing to operation, maintenance and decommissioning. The work covers technical details of the technology, as well as the management processes by which it is to be developed, designed, licensed, qualified, installed, and maintained. The interface of the equipment with the operators and other systems, and the interdependence with other fields, such as I&C aspects of reactor physics and human factors engineering, also fall into the TWG-NPPIC's scope of work. Some examples of the topics to be found in the work programme are:

- Implementation, installation, and commissioning of I&C systems
- Safety classification and qualification of I&C systems and components
- Verification and validation of I&C systems
- Security of digital I&C and computer systems
- Use of regulatory guidance, codes, and standards
- Nuclear I&C specification and design issues
- Reliability and dependability assessment of hardware and software components
- Common-cause failures of digital I&C systems
- Instrumentation for normal and accident conditions, including severe accidents
- Performance monitoring and optimization of processes, instrumentation, control and protection systems
- Surveillance, diagnostics, and prognostic techniques and systems
- Ageing, obsolescence and modernization of I&C systems
- Human–system interface, including control room design
- Computer technology for operator support systems
- Automation versus manual controls
- New nuclear I&C technologies (e.g. wireless communication, field programmable gate arrays)
- I&C technologies for new reactors (e.g. small modular reactors and generation IV reactors)
- Digital signal processing techniques and systems
- Electrical power supplies
- I&C aspects of engineering simulators, including severe accident conditions
- Issues of maintenance and repair of I&C systems and components

The TWG-NPPIC coordinates its work with other IAEA activities in interfacing areas, as well as with related activities of other international organizations, in order to enhance its effectiveness and to exchange information.

II. FUNCTIONS

The functions of the TWG-NPPIC are:

- To provide advice and guidance, and to marshal support in the Member States for the implementation of the IAEA's programmatic activities in the areas listed above.
- To provide a forum for information and knowledge sharing on the development of national and international programmes in the areas listed above.
- To act as a link between the IAEA and the national nuclear I&C communities, delivering information from and to national communities.
- To provide advice on preparatory actions in Member States and on the IAEA's activities in planning and implementing coordinated research programmes, collaborative assessments and other activities, as well as on the review of the results of NPP I&C projects.
- To develop and/or review selected publications in the IAEA Nuclear Energy Series, assess existing gaps and advise on the preparation of new publications.
- To identify important topics for discussion at meetings of the Standing Advisory Group on Nuclear Energy (SAGNE).
- To contribute to status reports, technology reviews, technical meetings and topical conferences in the field of NPP I&C systems and applications.
- To encourage the participation of young professionals, as appropriate, in IAEA activities.

III. MEMBERSHIP

Members of the TWG-NPPIC shall be appointed by the Deputy Director General, Head of the Department of Nuclear Energy following consultation with the respective national authorities or organizations.

Members of the TWG-NPPIC:

- Shall be recognized experts in the field of design, implementation, licensing, operation and maintenance, or modernization of NPP I&C systems, having extensive links with national I&C communities;
- Are to serve for a standard term of four years;
- Shall participate in the Group in their personal capacity and shall provide, as appropriate, views on national policies and strategies in the nuclear I&C field;
- May, as appropriate, bring other experts along to the meetings of the Group in order to provide additional information and share experience.

The total membership of the TWG-NPPIC shall not exceed 25 members.

The Deputy Director General, Head of the Department of Nuclear Energy may, from time to time, also co-opt additional members and/or invite observers from other IAEA Member States and international or regional organizations on an ad-hoc or continuing basis.

IV. CHAIRMANSHIP

The Chairman of the TWG-NPPIC shall be selected from the members of the Group by the Deputy Director General, Head of the Department of Nuclear Energy, based on the recommendation of the Group.

V. SECRETARIAT AND ADMINISTRATIVE AND TECHNICAL SUPPORT

Within available resources, the IAEA will provide for administrative and secretariat services required by the TWG-NPPIC, including meeting facilities, maintenance of records and distribution of documents. The IAEA will provide the services of a Scientific Secretary. Support, when required, will be provided by managers/staff from the Department of Nuclear Energy, or other relevant Department(s).

VI. METHODS OF WORK AND DELIVERABLES

Except as otherwise herein stated, the TWG-NPPIC shall determine its own methods of work, including preparation of its Agenda, establishment of special groups, keeping of records and other procedures, and shall report on its findings to SAGNE.

The activity of the TWG-NPPIC between the periodic TWG meetings shall be coordinated by the Chairman and the Scientific Secretary taking into due consideration the relevant recommendations of the TWG and SAGNE.

Following each TWG-NPPIC meeting, the Chairman and the Scientific Secretary shall provide the Deputy Director General, Head of the Department of Nuclear Energy with a report on its achievements and recommendations. The report shall also be published on the IAEA website in a format and content agreeable to all members.

The Chairman of the TWG-NPPIC shall communicate to SAGNE recommendations for strategic development or other important topics to be discussed at SAGNE meetings.

VII. MEETINGS

The TWG-NPPIC will meet at regular intervals but no more than once in a year with each meeting lasting up to five working days. Extraordinary meetings may be convened when required.

Meetings will be conducted in English only.

VIII. COSTS

The IAEA is not in a position to bear the travel and other costs of participants in TWG-NPPIC meetings. All costs involved in the participation of each TWG-NPPIC member, including travel and per diem expenses, shall in general be supported by the Member State/organization. However, the IAEA may contribute to the cost of attendance of the Chairman and of members from developing countries, if sufficient funds are available and if a significant contribution can be expected from the respective members to the meeting.