

Track		Description
Track 1	Plant Operations, Maintenance, Engineering, Modifications, Life Cycle and Balance of Plant	This Track is made up of Technical Sessions covering topics related to optimizing plant operations, including maintenance, modifications, performance evaluations, risk and outage/work window planning and management. Some of these topics may include the following: Component degradation, plant ageing, operational experiences, operations management, maintenance experiences, Safety culture, maintenance plans, engineering design development and implementation, quality assurance, performance measures and indicators, human factors and workforce aging, health physics and occupational exposure, O&M cost optimization, outage experience and techniques, in-service inspection, equipment repair, major equipment replacement experience (steam generators, etc.) and techniques, balance of plant issues and experience, power up-rating, plant systems maintenance and reliability improvements, cable and equipment evaluation testing, asset management, equipment reliability, component lifetime, risk based maintenance, reliability engineering, life cycle management, life extension experience and issues, technologies enabling life extension, economics of life extension. Engineering design, modifications and analyses.
Track 2	Nuclear Fuel and Materials	This track will cover topics related to recent developments in nuclear fuel and other major components reliability and material and chemistry issues in nuclear power plants including, but not limited to, the following areas: Advances in nuclear fuel, Operational experience with fuel and cladding, Pellet-cladding interaction, Fuel safety, operational and design criteria, Criticality and shutdown margin, CRUD deposition, Stress/strain/fatigue, Oxidation and hydrating, Thermal mechanical analyzes, Fuel melting, Cladding failure, Fuel fragmentation and fuel dispersal, Reactor vessel internals wear/corrosion issues, Irradiation damage and material behavior, Assessment and management of aging, environmentally induced materials degradation and damage, Design and manufacturing initiatives and in-service issues with balance of plant components, Steam generators material degradation and life management, Hydrazine optimization for steam generator systems, Databases for aging, Aging effects on failures, Computational advances in material evaluation, Material testing and property databases, Tribology, Crack behavior and Stress Corrosion Cracking mitigation technology, Low temperature embrittlement of welds, Boric acid corrosion control, Flow Accelerated Corrosion, Crud and corrosion mitigation techniques, Coolant/water chemistry control/optimization, In-Service Inspection, Non Destructive Examination Technology, Fatigue management (thermal and environmental), Effects of cold work/ residual plastic strain, Modeling of environmental degradation processes and probabilistic analysis, Risk-Based degradation and life cycle management requirements for extended operation, Application of advanced materials for operating reactors, Corrosion and Degradation Management for Balance of Plant Systems, Buried Pipeline Corrosion in Nuclear Power Plant.
Track 3	Plant Systems, Structures and Components	This track will cover the following topics, but not limited to, the following areas. Advances in structural design and analysis methods, failure modes and mechanisms, seismic design and analysis, linear and non-linear structural dynamic analyses, flow-induced vibrations and mitigation, fluid transient analyses in piping systems, fluid-structure interactions in reactor components, noise reduction, building and equipment isolation, vibration damping, containment and building mechanics, structural aspects of shock and explosion, wear experience and mitigation, nuclear power plant construction technology and management. The objectives are to allow authors and presenters to participate in this event and expand international cooperation, understanding and promotion of efforts and disciplines in the area of Plant Systems, Structural Integrity, and Components. Dissemination of knowledge by presenting research results, new developments, and novel concepts in plant systems, structures, components, as well as the construction of new plants will serve as the foundation upon which the conference program of this area will be developed.
Track 4	Radioprotection and Nuclear Technology Application	This track will cover topics related to; radiation protection can be divided into occupational radiation protection, which is the protection of workers, medical radiation protection, which is the protection of patients and the radiographer, and public radiation protection, which is protection of individual members of the public, and of the population as a whole. The types of exposure, as well as government regulations and legal exposure limits are different for each of these groups, so they must be considered separately. Non-power application of nuclear technology in various fields including agriculture, medicine, biology, radiation measurement, oil logging and so on. Non-classical nuclear system concepts, non-conventional energy conversion systems, shielding technology, Innovative nuclear concepts, Accelerate-Driven Subcritical system.
Track 5	Next Generation Reactors (including GIF Symposium)	The objective of this track is to explore Generation IV nuclear design concepts to open discussion and share knowledge on the expected safety and performance features of future builds. Papers are expected to cover the following areas: - Gen-IV reactor design concepts such as Supercritical-water-cooled Reactor, Sodium-cooled fast reactor, Very-high-temperature reactor, Gas-cooled fast reactor, Lead-cooled fast reactor, Molten-salt reactor. - Additional new concepts such as Small Modular Reactors(SMR), remote grid applications - Design concept features that enhance safety or performance over existing designs - Comparative studies on design efficiency, plant safety, cost reductions, etc.
Track 6	Advanced Reactors	This track includes all reactor designs for near-term deployment (including but not limited to reactor types such as VVER, AP1000, ESBWR, ABWR, System 80+, EPR, APWR, ACR Series, GT-MHR and PBMR), standard and certified designs, government programs supporting deployment, safety, economics of nuclear power, sustainability, construction and project management techniques. Topics may include policy and programmatic issues for advanced reactors, computational methods, neutronics, advanced light water reactor concepts, fuels, structures, materials, and components, experiments and testing facilities.

Track 7	Nuclear Safety and Security	This track addresses safety and security topics, such as: site and infrastructure security, political and public perception issues, international safety studies, advances in safety analysis codes and techniques, risk management, regulatory Issues, probabilistic safety assessment, plant safety analyses, accident management, severe accident analysis and mitigation, criticality safety and radiological safety, public health issues, personal and fire safety.
Track 8	Codes, Standards, Licensing, and Regulatory Issues	Globalization of codes and standards, risk-informed codes & standards and their applications (ISI/IST), probabilistic risk assessment standards, regulatory issues (risk-informed Part 50 and Part 50.59), AOV & MOV code issues, crane applications, piping repair & replacement, design & QA issues, standards and certification of software, strategic planning, license extension, licensing actions and developments, international licensing approaches, licensing of standardized plant designs, siting issues, plant licensing issues (build, operate), licensing of non-power and research reactors, environmental qualification.
Track 9	Fuel Cycle, Radioactive Waste Management and Decommissioning	Radioactive waste management encompasses a wide range of items, from very low level waste generated from the daily operations of a nuclear facility, to waste generated by decommissioning activities and high level waste generated from nuclear fuel. Managing these wastes is increasingly important in today's environmentally conscious society. The worldwide demand for green energy is driving a permanent solution for disposal of used nuclear fuel, whether or not the fuel is reprocessed or recycled. Minimizing the amount of waste generated is more and more important in the design of nuclear facilities and the development of fuels and fuel processing. In parallel with minimizing fuel waste is the development of methods and technology for the management and disposal of low and intermediate level wastes, to minimize the waste and to improve the environmental stability of the waste. These low level waste streams will be augmented by the increased decommissioning activities resulting from the world wide aging fleet of nuclear facilities. Improvements in waste reduction, recycling, and reuse of all forms of low, intermediate, and high level waste, will be important components of achieving environmental sustainability for the nuclear industry.
Track 10	Thermal-Hydraulics	Small and large-scale thermal-hydraulic experiments, laboratory and industrial measuring methods for thermal-hydraulic processes, basic single, two-phase and multiphase flow and heat transfer, thermal hydraulics simulations, system and component thermal-hydraulic codes development, separate thermal-hydraulic effects (critical heat flux, flooding, flow pattern transitions, two-phase choked flow, etc.), sub-channel thermal hydraulics, containment thermal hydraulics and aerosol transport, integral nuclear power plants behaviors under transient and malfunction conditions, thermal-hydraulics of molten core and severe accidents, coupling to system codes (like neutron kinetics, BoP, I&C), Best Estimate plus Uncertainty Analysis, Thermal-Hydraulics.
Track 11	Computational Fluid Dynamics (CFD) and Coupled Codes	Virtual prototypes of multidimensional single and multiphase systems, thermo-fluid dynamic models, numerical methods, mesh generation and visualization algorithms, code verification, code uncertainty analysis, complex flows coupled with heat and mass transfer, chemical reactions, computational multi fluid dynamics (CMFD), interpenetrating media, interface tracking, CFD applied to nuclear fuel rod bundles, spacers' design, and reactor coolant flows, CFD for transport phenomena in large-scale plant components (steam generators, condensers, etc.), porous media based CFD simulations, CFD simulations of turbulent flow and transport phenomena in single and multiphase systems, CFD and thermal-hydraulic codes coupling to system codes (like neutron kinetics, BoP, I&C) matching of boundaries of different dimensions.
Track 12	Reactor Physics and Transport Theory	This track will cover a wide range of topics in reactor physics, neutronics and transport theory bringing together researchers focused on conceptual, computational and design issues covering the classical foundations of neutron transport theory for idealized problems on one end, to hybrid and Monte Carlo super-computing simulation of real problems in nuclear industry. It will aim to serve as a platform for the exchange of ideas in a core nuclear engineering domain to serve the nuclear renaissance. Possible topics may include: Nuclear Data measurements, evaluations, validation, covariance data, and data needs; Core design methods, Numerical methods for diffusion, In-Core Fuel Management and Optimization, neutronics/thermo-hydraulics coupling; Fuel cycle physics, fuel cycle design optimization; Nuclear Criticality Safety Analysis methodologies and experiments, burnup credit, spent fuel disposition; Transport Theory Numerical methods, High performance computation, Deterministic transport methods, Monte Carlo Methods, shielding, neutron-gamma coupling.
Track 13	Nuclear Education, Public Acceptance and Related Issues	This track focuses on many topics including the training and education of students and personnel, government programs supporting deployment, safety, the economics of nuclear power, sustainability, construction and project management techniques, and the importance of international cooperation and collaboration. It also addresses issues such as maintaining adequate workforce levels and competency, as well as the importance of public communication and acceptance.
Track 14	Instrumentation and Controls (I&C)	This track focuses on I&C for next generation plants, Integrated control rooms, Hybrid control rooms, I&C refurbishment, Analog component supply issues, Digital versus Analogue I&C, Analog to digital conversion, Cabling, Reliable communication, Digital networks, Protection against common cause failures, Qualification of digital systems, Configuration management, Harmonization of standards, Licensing and Regulatory issues, Aging and Obsolescence issues, On-line Monitoring, FPGA- versus CPU-based systems, I&C system upgrades in research reactors, I&C Risk Modeling, I&C diagnostics and prognostics, In-pile instrumentation, Wireless technologies, Small Modular Reactors I&C, Advanced sensors, Software dependability, Software verification and validation, Software qualification, Cyber security, Neutron immunity systems. Human-Machine Interface Technologies.

Track 15	Fusion Engineering	Fusion nuclear design, analysis, technologies and materials, code development. Design & analysis of components/systems for fusion reactors/devices (blankets, shields, divertor, cooling systems, etc.); fusion technologies, including plasma heating, fuelling, controls and diagnostics, tritium reprocessing and handling; operations and remote maintenance of reactors, safety, decommissioning, and waste management, fuel cycle etc.; fusion related materials development. Specifically, design, analysis, technologies and materials for ITER, fusion devices and DEMO reactors.
Track 16	Beyond Design Basis Events	The track addresses the topics of Beyond Design Basis Accidents (BDBAs), including severe accident, such as the system behavior during the accidents, the evaluation of accident progress, the analysis by using computer codes, experimental study, PSA study for BDBAs, severe accident preventive and mitigative measures, severe accident management, the emergency response in NPPs, the insight from Fukushima accident, etc.
Track 17	Innovative Nuclear Power Plant Design and New Technology Application	This track is open to discuss any of the technical, scientific, economic, and environmental details of the many different designs and concepts for innovative power that can be accomplished from nuclear reactions. These innovative technologies include: IRIS, Traveling wave reactors, • Liquid metal cooled reactors, Barge mounted reactors, 4S, Nuclear batteries, etc. Specific topics include government programs supporting deployment, siting issues, environmental issues, safety issues, and economics of the various reactor types, sustainability, construction and project management techniques. This track promotes sharing of knowledge and expertise in this rapidly developing technical arena by presenting research results, new developments, and novel concepts in these reactor designs. Objectives Authors and presenters are invited to participate in this event to expand international cooperation, understanding and promotion of efforts and disciplines in the area of Innovative Nuclear Power Plant design, development, siting, and deployment. Dissemination of knowledge by presenting research results, new developments, and novel concepts in Innovative Nuclear Power Plant Design and New Technology Application will serve as the foundation upon which the conference program of this area will be developed.
Track 18	Student Paper Competition	The purpose of this track is to encourage the active participation of students in ICONE 23 by submitting high quality technical papers on the various aspects of nuclear engineering. Students participating in this track will be expected to make a technical presentation during the appropriate technical session, as well as to design a poster summarizing their work to be exhibited during ICONE 23 and discussed during a poster session. This track seeks to promote the interaction of future engineers with practicing and experienced engineers and to help them establish mentoring and networking links with the experts in their areas of interest. Visit the Student Program section of this website for additional information.
Track 19	Plenary and Panel Session	Track includes the conference Opening Session, Keynote Speakers along with Plenary Sessions and Panels. Leading delegates from the organizing committees, honorary chairs, industry and organization leaders will speak to the topic "Energy Mix for a Sustainable and Bright Future" from their experience and position. The session promises to be dynamic and set the tone for this year's outstanding conference. Submission is by Invitation Only. If you are interested in participating, please contact the Track Chair
Track 20	CFD Seminar and Workshops	The workshops or seminars will target young researchers and engineers to provide the basis and results for selected applications of certain problems. The series of workshops and seminars may include topics on software applications, experimental benchmarking, and ASME Codes, and Standards. The course may begin with the fundamental concepts and solution methods, then continues to recent developments and best practice guidelines for nuclear engineering applications. During the workshops or seminars, discussions and questions will be conducted to support analyses on existing plants and new plant constructions, as well as initiatives underway to address industry needs going forward. Submission is by Invitation Only. If you are interested in participating, please contact the Track Chair.
Track 21	Special Technical Track Fukushima Session	This track addresses off-site issues of the Fukushima Daiichi NPP accident. It includes environmental monitoring and investigations and numerical modeling for radionuclide migration in environment.