



**International Conference on  
Characterization and Quality Control of Nuclear Fuels  
17<sup>th</sup> – 19<sup>th</sup> November 2022**

**PROGRAMME**

**Day 1: November 17, 2022**

- Registration** : **08:00 – 09:00 hrs**
- Inaugural Session** : **09:00 – 11:30 hrs**
- Welcome Address : **Dr. Komal Kapoor**  
    *Addl. Chief Executive, NFC*  
    *Convener, CQCNF-2022*
- Address by : **Mr. D. Pramanik**  
    Co-chairman : *Addl. Chief Executive, NFC*  
    *Co - Chairman, Organizing Committee, CQCNF – 2022*
- Address by : **Dr. Dinesh Srivastava**  
    Conference Chair : *Chairman & Chief Executive, Nuclear Fuel Complex &*  
    *Chairman, Organizing Committee, CQCNF – 2022*
- Address by IAEA : **Mr. Kailash Agarwal**  
    Representative : *Fuel Cycle facility Specialist, IAEA*
- Address by : **Dr. D.K. Sinha**  
    Guests of Honour : *Director, AMD*
- Address by : **Dr. C. K. Asnani**  
    Guests of Honour : *Chairman & Managing Director, UCIL*
- Inaugural Address & : **Mr. G. Nageshwara Rao**  
    Talk by Chief Guest : *Chairman, Atomic Energy Regulatory Board*
- Vote of Thanks : **Mr. S. Sairam**  
    : *Dy. Chief Executive, Fuels*
- High Tea** : **11:30 – 12:00 hrs.**



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<b>Plenary Session -I</b>	:	<b>12:00 – 13:30 hrs</b> <b>Session Chair: Dr. Dinesh Srivastava, NFC</b> <b>Co-Chair: Alexander Ugryumov, TVEL</b>
12:00 – 12:30 Plenary Talk 1	:	IAEA's Activities in the Nuclear Fuel Engineering Area <b>Kailash Agarwal</b> <i>Fuel Cycle facility Specialist, IAEA</i>
12:30 – 13:00 Plenary Talk 2	:	Sustainable Mining and Recovery of Low Grade Uranium Ores in India <b>Dr. C. K. Asnani</b> <i>Chairman &amp; Managing Director, UCIL</i>
13:00 – 13:30 Plenary Talk 3	:	Cameco Fuel Services Division, Quality U can count on <b>Dale Clark</b> <i>Vice President, Cameco Fuel Services, Cameco Corp.</i>
<b>Lunch</b>	:	<b>13:30 – 14:30 hrs</b>



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<b>Session IA (Fuel Fabrication)</b>	:	<b>14:30 – 16:00 hrs</b>  <b>Session Chair: S.K. Jha, BARC</b>  <b>Co-chair: Sudhir Mishra, BARC</b>
14:30 – 14:50 Invited Talk 1	:	Opportunities and Challenges in the Global Uranium Market <b>David Doerksen, Cameco Corp.</b>
14:50 – 15:10 Invited Talk 2	:	MOX fuel fabrication: Recent trends and future Perspectives <b>R.B. Bhatt, BARC</b>
15:10 – 15:25 Oral Talk 1	:	Study on Effect of Physio-Chemical characteristic of Uranium Oxide for preparation of Uranium Metal <b>S. K. Satpati, BARC</b>
15:25-15:40 Oral Talk2	:	Morphology of actinide metal powders prepared by calciothermic reduction of their oxides <b>Raj Kumar, BARC</b>
15:40 – 15:55 Oral Talk 3	:	Development of continuous casting system for fabrication of U-6 wt.% Zr slugs inside the inert atmosphere glove box <b>T. V. Prabhu, IGCAR</b>
<b>Poster Session &amp; Tea Break</b>	:	<b>16:00 – 17:30 hrs</b>
<b>Cultural Programme &amp; Dinner</b>	:	<b>19:00 hrs onwards at Tusker Auditorium, AOC, Secunderabad</b>



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<b>Session IB (Characterization)</b>	:	<b>14:30 – 16:00 hrs</b>  <b>Session Chair: Dr. G K Dey, Former Group Director, BARC</b>  <b>Co-chair: S. Sairam, NFC</b>
14:30 – 14:50 Invited Talk 1	:	Microstructural Investigation of Zirconium Alloys Subjected to Neutron, Light and Heavy Ions Irradiations <b>Dr. R. Tiwari, BARC</b>
14:50 – 15:10 Invited Talk 2	:	Relevance of Accident Tolerance of Core Components and Fuels of Indian PHWRs <b>S.K. Sinha, BARC</b>
15:10 – 15:25 Oral Talk 1	:	Synthesis of MAX-phase ceramics powder & its coating for Zr-based accident tolerant fuel (ATF) cladding <b>Bikas C. Maji, BARC</b>
15:25-15:40 Oral Talk2	:	High-Temperature Steam Oxidation of Pre-Oxidized Zircaloy-4 Cladding Tube <b>Mohd. Kaleem Khan, IIT- Patna</b>
15:40 – 15:55 Oral Talk 3	:	Effect of Water and Brine $\beta$ -quench Cooling Rate on the Microstructure of Zr-1%Nb Alloy <b>M. Koleini, AEOI</b>
<b>Poster Session &amp; Tea Break</b>	:	<b>16:00 – 17:30 hrs</b>
<b>Cultural Programme &amp; Dinner</b>	:	<b>19:00 hrs onwards at Tusker Auditorium, AOC, Secunderabad</b>



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**Day 2: November 18, 2022**

<b>Plenary Session II</b>	:	<b>09:00 – 11:00 hrs</b>  <b>Session Chair: Dale Clark, Cameco Corp.</b>  <b>Co-chair: V. Shivakumar, BARC</b>
09:00 – 09:30 Plenary Talk 4	:	Self-reliant PHWR Fuel Fabrication Technology of NFC <b>D. Pramanik</b> <i>Addl. Chief Executive, NFC</i>
09:30 – 10:00 Plenary Talk 5	:	Phase Transformations in Zr based Alloys <b>Dr. G. K. Dey</b> <i>Former Group Director, BARC</i>
10:00 – 10:30 Plenary Talk 6	:	Current Status and Future Perspectives in Processing of Clad Materials for Thermal and Fast Breeder Reactors for Improved Performance <b>Dr. K. Kapoor</b> <i>Additional Chief Executive, NFC</i>
10:30 – 11:00 Plenary Talk 7	:	Clean Core's Thorium and HALEU Fuel for PHWRs <b>Mehul Shah</b> <i>Clean Core Energy, USA</i>
<b>Tea</b>	:	<b>11:00 – 11:30 hrs</b>



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<b>Session IIA (Fuel Fabrication &amp; Design)</b>	:	<b>11:30 – 13:00 hrs</b>  <b>Session Chair: D. Pramanik, NFC</b>  <b>Co-Chair: Dr. C N Patra, BARC</b>
11:30 – 11:50 Invited Talk 1	:	SMRs and it's Fuel <b>R. Dinesh Babu, BARC</b>
11:50 – 12:10 Invited Talk 2	:	Design & Development of MOX Fuels for Water Cooled Reactors <b>V. Shivakumar, BARC</b>
12:10 – 12:25 Oral Talk 1	:	Development of Artificial Neural Network (ANN) Model for Optimization of TIG welding of BWR Fuel Pins <b>Shibshankar Das, NFC</b>
12:25 – 12:40 Oral Talk 2	:	Design & Analysis of 19-Element Co-NU Fuel Bundle Assembly for 220 MWe PHWRs <b>Rahul Mani Tripathi, NPCIL</b>
12:40 – 12:55 Oral Talk 3	:	Effect of Processing Route on Mechanical Behaviour of Finned Aluminum Clad Tubes <b>Sayandeep Kundu, BARC</b>
<b>Lunch</b>	:	<b>13:00 – 14:00 hrs</b>



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<b>Session IIB (Characterization)</b>	: <b>11:30 – 13:00 hrs</b>  <b>Session Chair: G. Amarendra, RRF, DAE</b>  <b>Co-chair: B Kamalesh Kumar, NFC</b>
11:30 – 11:50 Invited Talk 1	: Delayed Hydride Cracking Behaviour of Zircaloy-4 Fuel Claddings <b>Dr. R.N. Singh, BARC</b>
11:50 – 12:05 Oral Talk 1	: Nodular corrosion of Zirconium Base Alloys in Water, Steam and Gas – A review <b>M. Kiran Kumar, BARC</b>
12:05 – 12:20 Oral Talk 2	: Microstructure Development during Hot Deformation of Zr-4 Alloy <b>Rupesh Kumar, NFC</b>
12:20 – 12:35 Oral Talk 3	: Structure-Property Correlation in Zirconium Alloy Appendage Welding for Manufacturing of PHWR Fuel Pins <b>Swarup Acharya, NFC</b>
12:35 – 12:50 Oral Talk 4	: Comparative study on processing routes for manufacturing of zircaloy-4 wire products <b>Kumar Vaibhaw, NFC</b>
<b>Lunch</b>	: <b>13:00 – 14:00 hrs</b>



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<b>Session IIIA (Fuel Fabrication)</b>	:	<b>14:00 – 15:30 hrs</b>  <b>Session Chair: P.G. Behere, BARC</b>  <b>Co-Chair: Dr. Sanjiv Kumar, NCCCM, BARC</b>
14:00 – 14:20 Invited Talk 1	:	Development and Fabrication of Plutonium bearing Fuels at BARC <b>Sudhir Mishra, BARC</b>
14:20 – 14:40 Invited Talk 2	:	Role of Analytical Chemistry in Nuclear Fuel Cycle <b>Dr. C.N. Patra, BARC</b>
14:40 – 14:55 Oral Talk 1	:	Determination of Uranium in uranium process stream solutions using Reversed-Phase Liquid Chromatography <b>Y. Balaji Rao, NFC</b>
14:55 – 15:10 Oral Talk 2	:	Separation of radioactive Cs, Sb and Co from Zr: The three-step ion exchange strategy for Decontamination of pressure tubes <b>K. K. Swain, BARC</b>
15:10 – 15:25 Oral Talk 3	:	Analysis of MOX Pellets for Hydrogen & Nitrogen Content Using Glove Box Adapted Twin Determinator System <b>A. Pandey, BARC</b>
<b>Tea</b>	:	<b>15:30 – 16:00 hrs</b>





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<b>Session IIIB (Quality Control &amp; NDE)</b>	:	<b>14:00 – 15:30 hrs</b>  <b>Session Chair: Dr. K. Kapoor, NFC</b>  <b>Co-Chair: M Shiva Kumar, NFC</b>
14:00 – 14:20 Invited Talk 1	:	Detection & Characterization of Defect and Wall Thickness Variation in Thin Walled Tube by Eddy Current Testing <b>Arbind Kumar, BARC</b>
14:20 – 14:40 Invited Talk 2	:	Automation and Indigenization in Quality Assurance of in-core Components and Structural for Indian PHWRs <b>R.K. Chaube, NFC</b>
14:40 – 14:55 Oral Talk 1	:	Development of an Ultrasonic Inspection Methodology for Non-Destructive Evaluation of End plug Welds Joined by Magnetic Pulse Welding <b>A. Viswanath, IGCAR</b>
14:55 – 15:10 Oral Talk 2	:	Gamma Scanning of Irradiated Mixed Carbide Fuel Pins of FBTR Operated at Different LHRs and Burn-ups <b>V. V. Jayaraj, IGCAR</b>
15:10 – 15:25 Oral Talk 3	:	Development of Quality Assurance Methodologies for Fabrication of Poison Sub-Assemblies of Fast Breeder Test Reactor <b>Altaf Ali, NFC</b>
<b>Tea</b>	:	<b>15:30 – 16:00 hrs</b>



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<b>Session IVA (Fuel Fabrication)</b>	: <b>16:00 – 17:30 hrs</b>  <b>Session Chair: R. Dinesh Babu, BARC</b>  <b>Co-Chair: U. K. Arora, NFC</b>
16:00 – 16:20 Invited Talk 1	: Safety, Remotisation and Automation in Pu Based Nuclear Fuel Fabrication <b>P.G. Behere, BARC</b>
16:20 – 16:40 Invited Talk 2	: Evolution of Fuel Fabrication at Nuclear Fuel Complex, Hyderabad <b>S. Sairam, NFC</b>
16:40 – 16:55 Oral Talk 1	: Fabrication of Nb <sub>2</sub> O <sub>5</sub> and MgO doped high density ThO <sub>2</sub> nuclear fuels pellets <b>Shubham Mohod, BARC</b>
16:55 – 17:10 Oral Talk 2	: Powder Conditioning and tooling modification for high capacity Rotary compaction press <b>Aman Agarwal, NFC</b>
17:10-17:25 Oral Talk 3	: Development of Innovative Technique for Treatment of Uranium bearing Hydraulic oil <b>A. Venkatesh, NFC</b>
<b>Cultural Programme &amp; Dinner</b>	: <b>19:00 hrs. at the Conference Venue</b>



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<b>Session IV B (Fuel Fabrication &amp; QA)</b>	:	<b>16:00 – 17:35 hrs</b> <b>Session Chair: R.B. Bhatt, BARC</b> <b>Co-Chair: Arbind Kumar, BARC</b>
16:00 – 16:20 Invited Talk 1	:	QA Trends in Nuclear Fuel Fabrication at NFC <b>B. Kamalesh Kumar, NFC</b>
16:20 – 16:35 Oral Talk 1	:	Commissioning of an Irradiation Capsule Fabrication Facility and Encapsulation of Metallic Fuel Pins in Irradiation Capsule for the Irradiation in FBTR <b>P. K. Chaurasia, IGCAR</b>
16:35 – 16:50 Oral Talk 2	:	Study on the Effect of Fe impurity in UNPS on UO <sub>2</sub> Pellets <b>Baidurjya Nath, NFC</b>
16:50 – 17:05 Oral Talk 3	:	Mechanization and Developments in UO <sub>2</sub> Green pellet Production <b>A. Shashank Reddy, NFC</b>
17:05 – 17:20 Oral Talk 4	:	Development of Inherently Safe Process for Refining of Magnesium <b>Samyuktha Gaddam, NFC</b>
17:20 – 17:35 Oral Talk 5	:	Development of process monitoring checklist in Fuel Facility Prioritizing the Process Parameters using Analytic Hierarchy Process <b>B. Haldar, NFC</b>
<b>Cultural Programme &amp; Dinner</b>	:	<b>19:00 hrs. at the Conference Venue</b>



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**Day 3: November 19, 2022**

<b>Plenary Session III</b>	:	<b>09:00 – 11:00 hrs</b>  <b>Session Chair: Mehul Shah, Clean Core, USA</b>  <b>Co-Chair: R.K. Chaube, NFC</b>
09:00 – 09:30 Plenary Talk 8	:	Chemical Quality Control of Nuclear Fuels <b>Dr. S. Kannan</b> <i>Director, RC &amp; I Group, BARC</i>
09:30 – 10:00 Plenary Talk 9	:	Key areas in developments of Russian Nuclear for NPPs <b>Alexander Ugryumov</b> <i>Vice President, TVEL, Russia</i>
10:00 – 10:30 Plenary Talk 10	:	Update on current operation of NAC Kazatomprom JSC <b>Miras Kyrgyzali</b> <i>Kazatomprom</i>
10:30 -11:00 Plenary Talk 11	:	Nuclear fuel safety: A Regulator's Perspective <b>Hari Kumar</b> <i>Head, NPSD, AERB</i>
<b>Tea</b>	:	<b>11:00 – 11:30 hrs</b>



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**Day 3: November 19, 2022**

<b>Session V A (Characterization)</b>	:	<b>11:30 – 13:00 hrs</b>  <b>Session Chair: Dr. R.N. Singh, BARC</b>  <b>Co-Chair: Y. Balaji Rao, NFC</b>
11:30 – 11:50 Invited Talk 1	:	Nuclear Techniques in the Non-Destructive Compositional Analysis of Nuclear Materials <b>Dr. Sanjiv Kumar, NCCCM, BARC</b>
11:50 – 12:10 Invited Talk 2	:	Neutron Activation Analysis, a Tool for Multi-elemental Analysis in Various Matrices <b>Dr. V. Nagendra Kumar Putta, GITAM University</b>
12:10 – 12:25 Oral Talk 1	:	Feasibility Study for a 3D Mapping system of the Radiological and Mechanical Profile of Fuel Pin in Fast Reactors <b>Shri Vidhatri M.M., IIT, Hyderabad</b>
12:25 – 12:40 Oral Talk 2	:	Study on Phase Transformation Kinetics of U-8Mo-1X Ternary Alloys (X= Mo, Zr, V) <b>R. Rakesh, BARC</b>
12:40 – 12:55 Oral Talk 3	:	Characterization of Nuclear and Sinterable Grade UO <sub>2</sub> Powder Produced Through Direct Reduction of ADU <b>Swathi Mohan, NFC</b>
<b>Lunch</b>	:	<b>13:00 – 14:00 hrs</b>
<b>Panel Discussion &amp; Valedictory Function</b>	:	<b>14:00 – 15:00 hrs</b>
<b>Tea</b>	:	<b>15:00 – 15:30 hrs</b>
<b>-- End of Conference --</b>		



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**Day 3: November 19, 2022**

<b>Session V B (Automation &amp; Core Structural)</b>	:	<b>11:30 – 13:10 hrs</b>  (Session Chair: <b>Dr. D S Setty, NFC</b>  Co-Chair: <b>S. K. Pathak, NFC</b> )
11:30 – 11:50 Invited Talk 1	:	Machine vision for nuclear fuel cycle production <b>Praveen Deshpande, RRCAT</b>
11:50 – 12:10 Invited Talk 2	:	Introduction of GIA Clecim Press <b>Gaspar Fernandez Roldan, GIA Clecim Press, Spain</b>
12:10 – 12:25 Oral Talk 1	:	Development of machine vision based inspection system for inspection of chamfer on clad tube <b>S. K. Agarwal, RRCAT</b>
12:25 – 12:40 Oral Talk 2	:	Deep Learning based Technique for Inspection of PHWR Fuel Bundle End Plate Weld Joints <b>Rahul Jain, BARC</b>
12:40 – 12:55 Oral Talk 3	:	Development of induction heating coil without water cooling for metal fuel slug casting system <b>J. Jagadeesh Chandran, IGCAR</b>
12:55 – 13:10 Oral Talk 4	:	Development of a high temperature capsule based on gas gap concept for irradiation of core structural material specimens in FBTR <b>M. Muthuganesh, IGCAR</b>
<b>Lunch</b>	:	<b>13:10 – 14:00 hrs</b>
<b>Panel Discussion &amp; Valedictory Function</b>	:	<b>14:00 – 15:00 hrs</b>
<b>Tea</b>	:	<b>15:00 – 15:30 hrs</b>
<b>-- End of Conference --</b>		