GIF Education and Training series
Webinar #100

GEN IV International Forum
Expertise | Collaboration | Excellence

Advanced manufacturing supporting Gen IV reactor systems
Hosted by the GIF Education and Training Working Group

Join us on April 15, 2025, 14:30 CEST (UTC+2)

Advanced manufacturing supporting Gen IV reactor systems

The timeous and economic deployment of new generation reactors has several barriers to overcome with some examples being (1) qualified high temperature material (2) large scale fabrication and integration of components through welding processes (3) suppliers with NQA-1 qualification and (4) environmental testing facilities. Additionally, barriers for first entrée to market are the perception that new materials and the associated manufacturing techniques are too arduous and therefore not a thought within the design decision framework. Various organizations and working groups, both national and international, are working together to debunk the perceptions, with strong and focused industry focused research to systematically address the technical barriers. Additionally, the paradigm for material research has changed significantly over the past decade, to ensure fully integrated material and manufacturing development, therefore not only accelerating the development processes, but also to ensure that it is manufacturable and that unique or enhanced properties are being generated. Although additive manufacturing processes are known to have beneficial opportunities to leverage for new reactor designs, various other advanced manufacturing processes are available to be explored.

This presentation will provide an overview of the GIF Advanced Manufacturing and Materials Engineering working group (AMME WG) and the collaborative research in process to highlight the role that advanced manufacturing can have on the deployment of Gen IV systems. Additionally, opportunities of various other manufacturing processes are discussed with potential key applications. As there is no “one recipe fits all”, it is important that a designer and developer should explore the behavior of the component material-manufacturing process combo over the full lifecycle. The presentation will close by providing an brief overview of the US Advanced Materials and Manufacturing Technologies program.

Dr. Patricia Paviet from PNNL, USA, member of GIF ETWG will facilitate this webinar.

The GIF ETWG webinar series started in 2016 and more than 95 webinars have been streamed since then. People from more than 80 countries have attended these webinars over the years. You can learn more about previous webinars and ETWG activities on the GIF website.

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When:

April 15 - 2025
14:30 CEST (UTC+2)

Who should attend:

policymakers, industry professionals, regulators, researchers, students, general public

Speaker

Dr. Isabella van Rooyen

Dr. Isabella J. van Rooyen is a Senior Technical Advisor for Advanced Material Systems at Pacific Northwest National Laboratory (PNNL), following 10.5 years at Idaho National Laboratory (INL) as a Distinguished Staff Scientist. Dr van Rooyen supports the Department of Energy, Nuclear Engineering Office as (1) United States representative and co-chair on the International Advanced Manufacturing and Materials Engineering Working Group for Generation IV reactors (GIF AMME WG); (2) Advanced Material and Manufacturing technical area lead for Advanced Materials and Manufacturing Technologies (AMMT) program; and (3) previously as National Technical Director for the “Advanced Methods for Manufacturing” (AMM) program. Experience spans nuclear, aerospace, and automotive industries for high temperature materials development (e.g., SiC, Zircaloy, beryllium, titanium, nickel alloys, tungsten-copper, composite materials, Fe-based alloys, Ni-based alloys, HEA), nuclear fuels (e.g., UO2, UCO, U3Si2, TRISO) and advanced manufacturing techniques such as laser materials processing (joining, welding, cladding, etc.), casting processes, powder metallurgy (sintering, hot isostatic pressing (HIP), etc.), and additive manufacturing (AM) processes. Dr. van Rooyen has more than 60 journal publications, 40 conference contributions, 7 granted patents and holds a PhD (physics), MSc(metallurgy), and MBA.