GEN IV International Forum
Expertise | Collaboration | Excellence

The ALLEGRO Experimental Gas-Cooled Fast Reactor Project

Summary / Objectives:

The webinar presents the main design features of the ALLEGRO nuclear reactor demonstrator as developed in the frame of the European V4G4 Consortium "V4G4 Centre of Excellence" associating nuclear research organizations from the Czech Republic, Hungary, Poland, Slovakia and France. The presentation provides an overview of the existing concepts of ALLEGRO, goals of the development, specific design solutions, and the safety approach and safety characteristics of ALLEGRO, touching the most important aspects of the demonstrator. Latest developments associated with both the use of UOX fuel and the new safety features are briefly presented as well. The remaining research challenges are summarized in the light of the present technology understanding to highlight the present status of knowledge and further steps to be pursued.

Meet the Presenter:

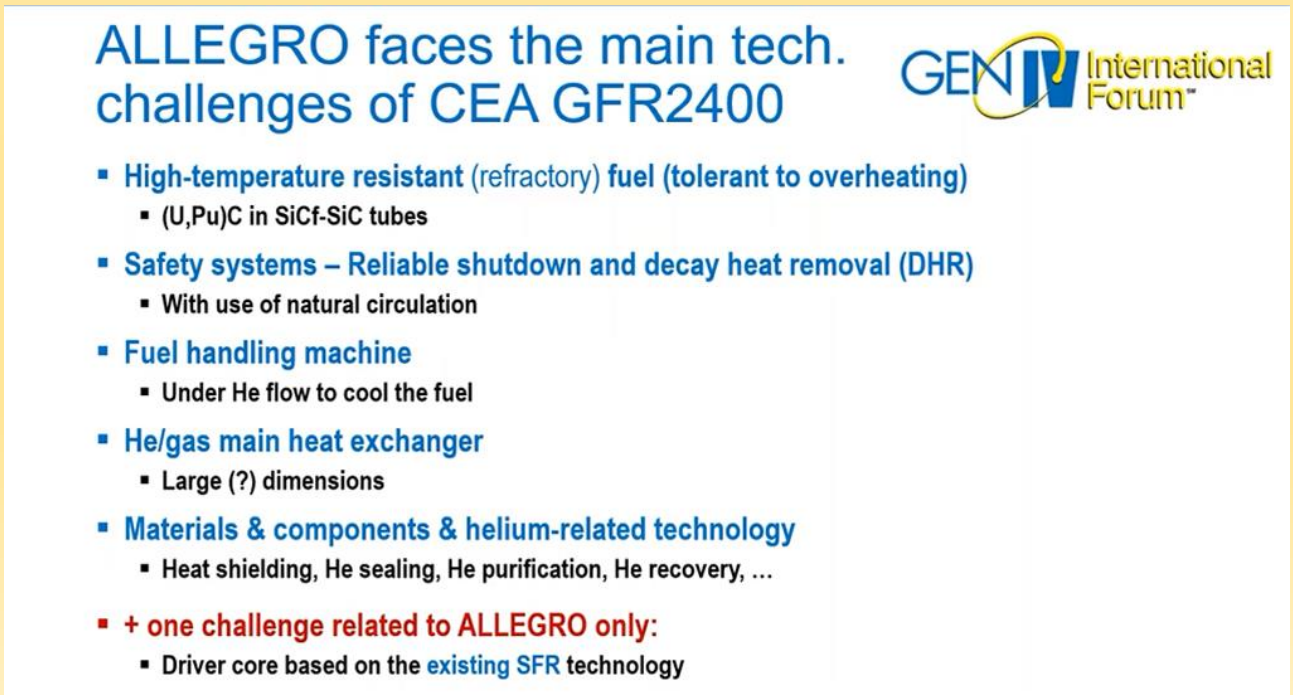
Dr. Ladislav Bělovský works at the ÚJV Řež, a. s., Husinec-Řež close to Prague, Czech Republic as a senior engineer and has over 30 years of experience in nuclear energy research. At ÚJV Řež, Dr. Bělovský participates in the development of the helium-cooled demonstration Fast Reactor ALLEGRO in the frame of the international association "V4G4 Centre of Excellence" in the following areas: 1) Design & Safety of the reactor, 2) Related R&D focused on safety, helium technology and material research. His background in the Czech republic and France in the period from 1988 to 2011 is mainly characterized by activities in the development & application of computer codes for modelling of LWR fuel behavior in design basis & severe accident conditions.

1. A first ever GFR demonstrator ALLEGRO

The purpose of a first ever GFR demonstrator ALLEGRO is verification and validation of the fuel, proving that it works safely and getting the experience of gas cooled fast reactor.

2. The main technological challenges of ALLEGRO:

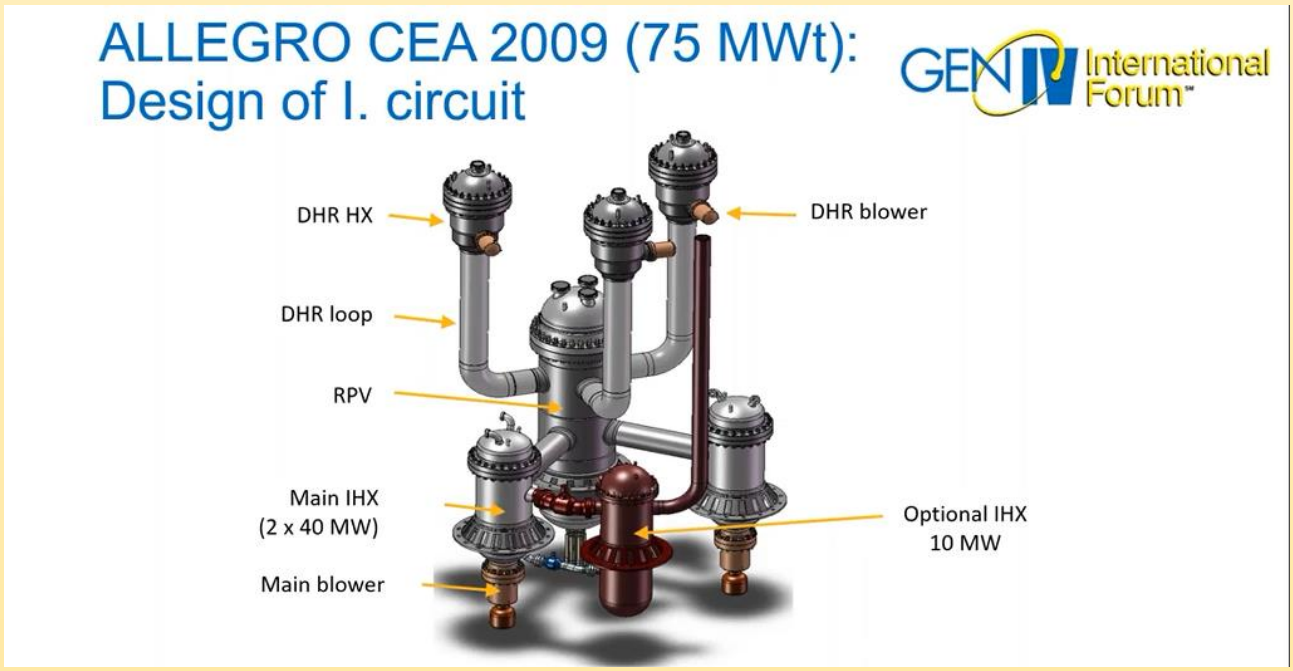
ALLEGRO will touch the challenges concerning the high temperature resistant, safety, fuel handling and so on.



3. Pre-conceptual design of ALLEGRO:

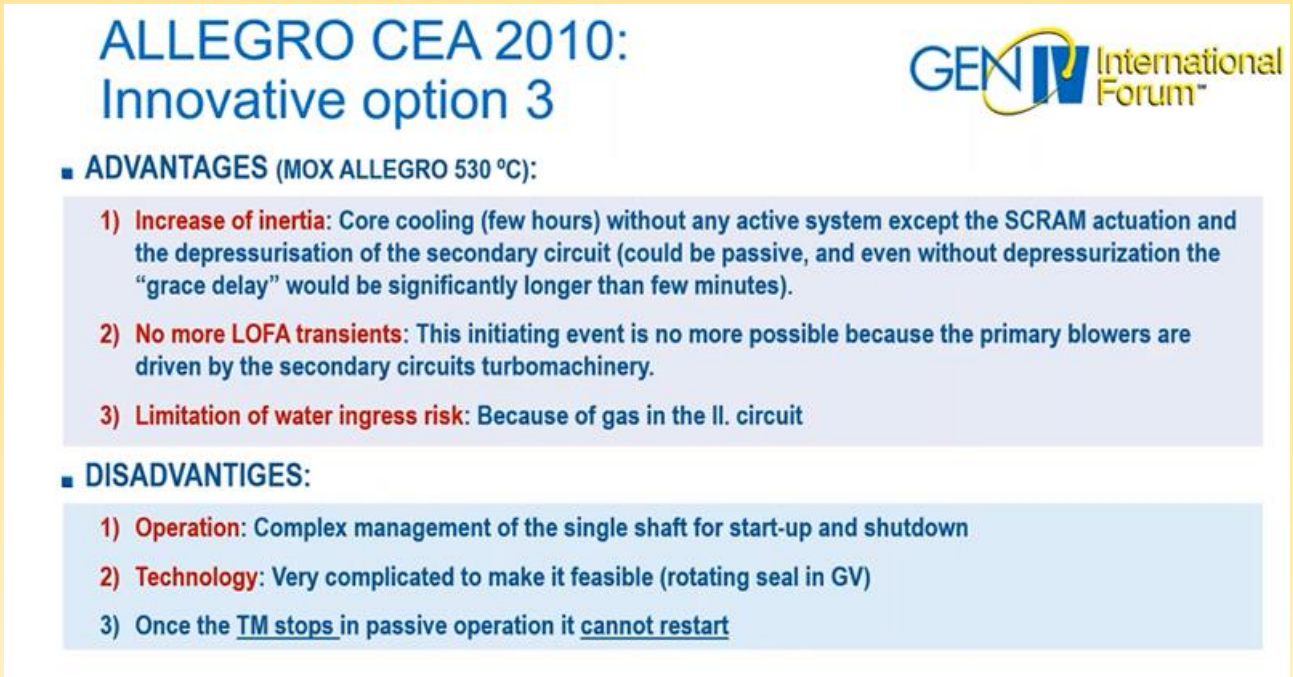
Characteristic of Pre-conceptual design of ALLEGRO are:

- Two main circuits and loops, which would be a safer solution
- Three decay heat removal heat exchanger using the Chimney effect
- Optional gas heat exchanger



4. Advantages and disadvantages of the latest version of ALLEGRO:

The latest version of ALLEGRO has advantages such as core cooling without any active system (except some cases), no more LOFA transients, etc. The disadvantages are complex management for start-up and shutdown, etc.



5. ALLEGRO V4G4 Centre of Excellence:

V4G4 Centre of Excellence is an association system for ALLEGRO preparatory phase between SK, CZ, HU, PL and FR. Each of them is in charge of an assigned development topic.

6. Time schedule overview:

ALLEGRO project is planed to proceed with the time schedule below:

- 2020 : Providing pre-conceptual design
- 2025 : Providing conceptual design
- 2026 - : Decision to continue and post-conceptual phase