VINCO
Visegrad Initiative for Nuclear Cooperation

Project VINCO
Newsletter

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Horizon 2020 Project

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ALLEGRO

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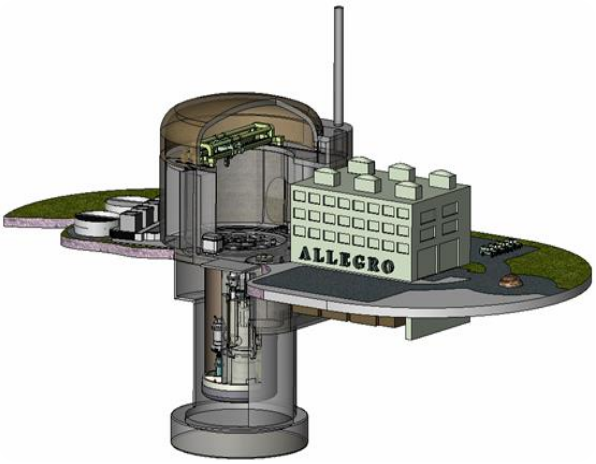
ALLEGRO is an experimental fast reactor cooled with Helium being developed by the European V4G4 Consortium "V4G4 Centre of Excellence" of the nuclear research organizations of the Czech Republic, Hungary, Poland and Slovakia associated with CEA, France. Development of ALLEGRO is an important step on the way to the Gas-cooled Fast Reactor, one of the six concepts selected by the Generation IV International Forum and one of the three fast reactors supported by the European Sustainable Nuclear Energy Technology Platform.



The main purposes of ALLEGRO is the development of:

- GFR refractory fuels (UPuC SiC-SifC cladding)
- Helium related technologies (components, instrumentation, purification…)
- Safety technical issues and corresponding safety approach framework.

See ALLEGRO characteristics table on page 3…

ESNII Task Force Meeting #21

Author: L. Belovsky [UJV Rez]

The 21th meeting of the European Sustainable Nuclear Industrial Initiative Task Force (ESNII TF), chaired by Mr. Noel Camarcat, was held in London on 15th June 2016. The main purpose of the meeting was to inform the chairman about the progress of the ESNII projects: ASTRID, MYRRHA, ALFRED and ALLEGRO. The general overview of the ALLEGRO

programme progress was provided by Mr. Darilek (VUJE). The next Task Force meeting will be held in winter 2016/2017 in Paris.

VINCO WP3 Brainstorming Session on Safety of GFR/ALLEGRO

Author: L. Belovsky [UJV Rez]

A brainstorming session on safety of GFR/ALLEGRO was organized in the frame of VINCO WP3 in VUJE a.s. (Trnava, Slovakia) on 5-8 September 2016. It was devoted to training on safety aspects of gas cooled reactor technologies, namely the gas-cooled fast reactor demonstrator ALLEGRO. The existing knowledge & new ideas on the concept of decay heat removal system of ALLEGRO were discussed. Simultaneously were also discussed principles of safety analyses as part of development of nuclear reactors. In the session participated both young and senior specialists from VUJE, UJV Rez and MTA-EK.

An International Course: Generation IV Nuclear Reactor Systems for the Future

Author: L. Belovsky, [UJV Rez]

An International Course: Generation IV Nuclear Reactor Systems for the Future will take place on 10-14 October 2016 in Saclay, France. Professionals, researchers and students interested in fourth generation nuclear reactors are invited to participate in this International Course. The objective is to provide participants with up-to-date basic knowledge on the six concepts which were selected for generation IV nuclear systems (SFR, LFR, GFR, VHTR, SCWR, MSR). L. Belovsky from UJV Rez will give the lecture on the GFR demonstrating reactor ALLEGRO. Registration deadline at INSTN website is 19 September 2016.

Euratom Call for Projects H2020 – Opportunity for International Collaboration

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Compared to the Euratom Work Programme 2014-2015, the fission part of Euratom Work programme 2016-2017 placed more emphasis on the long-term security of energy supply at EU level with topics on the possible optimization of the use of resources through further investigation of the safety and feasibility of Generation-IV reactors and closed fuel cycle options, whilst continuing to pay particular attention to the European added value of research on related safety issues. Large number of project proposals can be likely expected. Among others also V4G4 community decided to submit a project proposal called ALFA. The overall objective of the proposed ALFA project is to investigate safety status and safety improvements of critical fast neutron Generation IV (Gen IV) gas cooled reactors (GFR), with focus to all associated systems of the nuclear island. The project will be based on already performed EU research activities and results of previous successful projects oriented on GFR demonstrator, ALLEGRO.

ALLEGRO Main Design Characteristics

Nominal Power (thermal)	75	MW	Reduced power is being considered in the range 30 – 75 MW.
Nominal Power (electrical)	0	MW	
Power density	100	MW/ m^3	Reduced power density is being considered in the range 50 – 75 MW/m^3.
Fuel	MOX/ SS cladding		Start-up core. Feasibility of LEU UOX for the start-up core is being investigated.
	UPuC/ SiCSifC cladding		Long term core.
Type of fuel assembly	Hexagonal wrapper and wired fuel rods		
Number of fuel rods per assembly	169		
Number of fuel assemblies	81		
Number of experimental fuel assemblies	6		
Number of control and shutdown rods	10		
Primary circuit coolant	Helium		
Secondary circuit coolant	Water		Gas is being investigated
Tertiary circuit coolant	Air		Atmosphere
Primary pressure	70	bar	
Core inlet/outlet temperatures	260/516	°C	Should be upgraded for full core refractory fuel.
Number of primary loops	2		
Number of secondary loops	2		
Number of DHR loops	3		Directly connected to the primary vessel
DHR circuits coolant	Helium		
DHR intermediate circuits coolant	Water		
DHR heat sink	Water pool		
Number of accumulators	3		Filled with Nitrogen