



**(Project Number: 945 041)**

**DELIVERABLE D6.5**

**Report from outreach activities**

Lead Beneficiary: UJV

Due date: 30/09/2024

Released on: 23/09/2024

<b>Authors:</b>	Petr Vacha	
<b>For the Lead Beneficiary</b>	<b>Reviewed by Work package Leader</b>	<b>Approved by Coordinator</b>
<b>Petr Vacha</b>	<b>Jakub Heller</b>	<b>Boris Kvizda</b>

Start date of project:

**01/10/2020**

Duration: **48 Months**

Project Coordinator Organisation:

**VUJE, a. s.**

VERSION: 1.1

<b>Project co-funded by the European Commission under the Euratom Research and Training Programme on Nuclear Energy within the Horizon 2020 Programme</b>		
<b>Dissemination Level</b>		
<b>PU</b>	Public	<b>X</b>
<b>RE</b>	Restricted to a group specified by the Beneficiaries of the SafeG project	
<b>CO</b>	Confidential, only for Beneficiaries of the SafeG project	

### Version control table

Version number	Date of issue	Author(s)	Brief description of changes made
1.0	05/09/2024	M. Velckova, P. Vacha	1 <sup>st</sup> draft
1.1	21/09/2024	S. Bebjak, B. Kvizda	Reviewed by MST and coordinator Final version

### Project information

Project full title:	Safety of GFR through innovative materials, technologies and processes
Acronym:	SafeG
Funding scheme:	Research and innovation action
ECGA number:	945041
Programme and call	Horizon 2020 Framework Programme for Research and Innovation (2014-2020) NFRP-2019-2020 (Nuclear Fission and Radiation Protection Research)
Coordinator:	Boris Kvizda
EC Project Officer:	Cristina Fernandez Ramos
Start date – End date:	01/10/20 – 30/09/2024 i.e. 48 months
Coordinator contact:	+421 33 599 1173, boris.kvizda@vuje.sk
Administrative contact:	+420 602 771 784, jakub.heller@evalion.cz
Online contacts (website):	<a href="http://www.safeg.eu">www.safeg.eu</a>

### Copyright

The document is proprietary of the SafeG consortium members. No copying or distributing, in any form or by any means, is allowed without the prior written agreement of the owner of the property rights. This document reflects only the authors' view. The European Community is not liable for any use that may be made of the information contained herein.



*„This project has received funding from the Euratom research and training programme 2019-2020 under grant agreement No 945041”.*

## **EXECUTIVE SUMMARY**

Due to fact that SafeG is a part of broader initiatives leading to construction of GFR experimental reactor ALLEGRO, it was therefore vital to maximise the outreach of the project activities mainly within V4G4 Centre of Excellence but also towards other relevant initiatives such as Generation IV International Forum and European Sustainable Nuclear Industrial Initiative. This document presents a summary of outreach activities towards identified networks and initiatives.

UJV coordinated the networking and harmonization activities including regular presentation of project results at the events organized in frame of above-mentioned initiatives. Interaction with other platforms and EU projects, initiatives and international organisations, particularly with the Generation IV International Forum was performed also by other involved project partners, such as VUJE, EK, CVR and CEA. The key results of the project were presented at the SafeG Final Workshop to wide spectrum of participants from the nuclear field (deliverable D6.6).

## CONTENT

<b>EXECUTIVE SUMMARY .....</b>	<b>3</b>
<b>1 INTRODUCTION .....</b>	<b>5</b>
<b>2 INTERACTION WITH V4G4 CENTRE FOR EXCELLENCE .....</b>	<b>6</b>
2.1 REPRESENTATION OF THE SAFE G PROJECT AT THE V4G4 CENTRE FOR EXCELLENCE .....	6
2.2 OUTREACH ACTIVITIES AT V4G4 .....	6
<b>3 OUTREACH ACTIVITIES TOWARDS GENERATION IV INTERNATIONAL FORUM .....</b>	<b>8</b>
3.1 REPRESENTATION OF THE SAFE G PROJECT AT GENERATION IV INTERNATIONAL FORUM .....	8
3.2 OUTREACH ACTIVITIES TOWARDS GIF .....	8
<b>4 OUTREACH ACTIVITIES TOWARDS THE SUISTAINABLE NUCLEAR ENERGY TECHNOLOGY PLATFORM AND EUROPEAN SUSTAINABLE NUCLEAR INDUSTRIAL INITIATIVE .....</b>	<b>10</b>
<b>CONCLUSIONS .....</b>	<b>12</b>

## 1 INTRODUCTION

Viability of the GFR technology will be demonstrated by a successful operation of a demonstration unit. It has been developed under the name ALLEGRO, and it will be used not only for technology demonstration, but also for development and qualification of innovative components & systems, first of all the innovative refractory fuel. The concept of the ALLEGRO demonstrator was originally developed in the first decade of this century by CEA, featuring a two-loop design, and with thermal power 75 MW. The CEA activities brought the ALLEGRO demonstrator to the Technology Readiness Level (TRL) 2. In 2010, four private companies in collaboration with research organisations (VUJE, UJV, EK and NCBJ) from Slovakia, Czech Republic, Hungary and Poland signed a Memorandum of understanding, which resulted in establishment of a legal entity, the “V4G4 Centre of Excellence” (V4G4 CoE) in 2013. CEA has become an associated member in 2017, and Research Centre Řež (CVR) has been an associated member of the CoE since 2019. The goal of the V4G4 CoE has been the continuation of the GFR development focused primarily at finishing the conceptual design phase of its demonstrator, ALLEGRO.

In the light of the ambitious nature of the whole concept, international cooperation, communication and outreach to relevant initiatives operating in the same field, is considered to be essential for a timely progress in the development of GFR. The cooperation and outreach to networks such as Generation IV International Forum, The Sustainable Nuclear Energy Technology Platform and European Sustainable Nuclear Industrial Initiative, makes it possible to pursue multiple goals and technical options concurrently, and to avoid any premature down selection due to the lack of adequate resources and knowledge on individual national levels.

## 2 INTERACTION WITH V4G4 CENTRE FOR EXCELLENCE

### 2.1 Representation of the SafeG project at the V4G4 Centre for Excellence

Development of ALLEGRO is governed by a consortium named V4G4 Centre of Excellence (V4G4 CoE), that was established in 2012 in Slovakia by its four founding members (alphabetically) – EK from Hungary, NCBJ from Poland, UJV Rez from the Czech Republic, and VUJE from Slovakia. It now has also two associated members – CEA from France and CVR from Czechia. In 2019, a third level of participation in V4G4 CoE was established in the form of “officially collaborating organizations”. A selected member of V4G4 CoE is responsible for managing contributions of each of the aforementioned organization.

There are two governing bodies of V4G4 CoE called “Project Coordination Team” (PCT) and “Steering Committee” (SC). While PCT is responsible for coordination of the technical tasks in R&D, SC makes strategic decisions and serves as the management board of the consortium. In total, around 20 people are working on the project from the V4G4 CoE member organizations and their associates, with additional approximately 50 working on specific projects.

*Representatives from the SafeG consortium in the Project Coordination Team (PCT) of V4G4 Centre for Excellence:*

- Branislav Hatala (VUJE)
- Boris Kvizda (VUJE)
- Petr Vacha (UJV)
- Gusztáv Mayer (EK)
- Janusz Malesa (NCBJ)
- Frederic Serre (CEA)
- Tomas Melichar (CVR)
- Advisory Board member János Gadó - chairperson of V4G4 Centre of Excellence Steering Committee
- 

### 2.2 Outreach activities at V4G4

SafeG project members continuously inform on project progress and results on networks' meetings such as following:

- *20<sup>th</sup> V4G4/Project Coordination Team Meeting* - 7-8 June 2022, Budapest
- *37<sup>th</sup> V4G4/ALLEGRO Steering Committee meeting* - 9 June 2022, Budapest
- *38<sup>th</sup> V4G4/ALLEGRO Steering Committee meeting* – 8 November 2022, Prague
- *21<sup>st</sup> V4G4 ALLEGRO PCT meeting* (Project Coordination Team), 7-8 November 2022, Prague
- *22<sup>nd</sup> V4G4 ALLEGRO PCT meeting*, 28-29 March, 2023, Trnava
- *39<sup>th</sup> V4G4/ALLEGRO Steering Committee meeting*, 30 March 2023, Trnava
- *23<sup>rd</sup> V4G4 ALLEGRO PCT meeting* (Project Coordination Team), 5-6 September 2023, Budapest
- *40<sup>th</sup> V4G4/ALLEGRO Steering Committee meeting*, 7 September 2023, Budapest

- *24<sup>th</sup> V4G4/ALLEGRO Project Coordination Team meeting, 6 – 8 February 2024, Řež, Czechia*
- *41<sup>st</sup> V4G4/ALLEGRO Steering Committee meeting, 8 February 2024, Řež, Czechia*
- *42<sup>nd</sup> V4G4/ALLEGRO Steering Committee and Project Coordination Team meeting – 12 September, 2024*

During the meetings of PCT, which is the highest technical body of V4G4 CoE, results of the SafeG project were regularly discussed in the broader context of development of the ALLEGRO demonstrator and incorporation of these results into the workstreams of V4G4 CoE.

Chairman of the PCT and the coordinator of the SafeG project then informed the members of the SC about the progress of the project and the incorporation of its results into the ALLEGRO project.

Majority of the results of the SafeG project were adopted into the reference design of ALLEGRO, and into the workstreams aiming at expanding and deepening of the knowledge gained from the project. The solutions from SafeG that were not adopted are well documented and kept as back-up solutions in the reference design.

### **3 OUTREACH ACTIVITIES TOWARDS GENERATION IV INTERNATIONAL FORUM**

#### **3.1 Representation of the SafeG project at Generation IV International Forum**

Established in 2001, the Generation IV International Forum (GIF) was created as a co-operative international endeavour seeking to develop the research necessary to test the feasibility and performance of fourth generation nuclear systems, and to make them available for industrial deployment by 2030. The GIF brings together 13 countries (Argentina, Australia, Brazil, Canada, China, France, Japan, Korea, Russia, South Africa, Switzerland, the United Kingdom and the United States), as well as Euratom – representing the 27 European Union members – to coordinate research and development on these systems.

The GIF has selected six reactor technologies for further research and development, the gas-cooled fast reactor (GFR) is one of them.

Additionally, in the framework of GIF, a project dedicated to conceptual design and safety of ALLEGRO has been ongoing, as well as a project on GFR fuel safety. Within the conceptual design and safety project, activities complementing the work done within the Czech national projects, and the SafeG project, have been ongoing, within Euratom and France collaboration. The GFR fuel safety project focuses mainly onto development of SiC-based cladding materials for GFRs. Euratom, France, and Japan have been collaborating on this task. Under the UJV-CVR-JRC multilateral agreement, one project dedicated to GFR is ongoing, led by UJV Rez. It complements the Czech national project “NOVA”, using the unique equipment and knowhow of JRC Karlsruhe in the field of precise measurements of thermo-physical properties of materials.

#### **Representation of the SafeG at GIF**

Branislav Hatala (VUJE)

Zoltán Hózer (EK)

Petr Vácha (UJV)

Gusztáv Mayer (EK)

Tatsuya Hinoki (KU)

#### **3.2 Outreach activities towards GIF**

Representatives of the SafeG presented outcomes of the project progress on a following meetings:

- *Common GIF SSC / WG / TF / SIAP report sessions* - Virtual teleconference meeting - 17.10.2022
- *53<sup>rd</sup> GIF Policy Group meeting* - 21 May, 2022 (virtual)
- *55<sup>th</sup> GIF Policy Group and 49<sup>th</sup> GIF Experts Group meeting* - 17-21 April 2023, Lyon, France
- *34<sup>th</sup> GIF GFR System Steering Committee Meeting* - 3 October, 2023, Bratislava
- *56<sup>th</sup> GIF Policy Group and 50<sup>th</sup> GIF Experts Group meeting* - 17-20 October 2023, Paris, France

Representatives of the SafeG presented and discussed the results of the SafeG project and their connection to work done within the GIF GFR System Steering Committee.





*Figure 1: Branislav Hatala presenting SafeG at GEN IV International Forum*

## 4 OUTREACH ACTIVITIES TOWARDS THE SUSTAINABLE NUCLEAR ENERGY TECHNOLOGY PLATFORM AND EUROPEAN SUSTAINABLE NUCLEAR INDUSTRIAL INITIATIVE

The Sustainable Nuclear Energy Technology Platform (SNETP) was established in September 2007 as a R&D&I platform to support and promote the safe, reliable and efficient operation of Generation II, III and IV civil nuclear systems. The international membership base of the platform includes industrial actors, research and development organisations, academia, technical and safety organisations, SMEs as well as non-governmental bodies.

The ESNII initiative has been able to gather European teams around technologies and demonstration projects to pursue R&D on Generation IV systems using technologies based on fast neutron spectrum and closed fuel cycles allowing competitive and sustainable energy production, better use of the uranium resources as well as waste minimization. The main strategy is to promote the advances in R&D&I of these technologies, strengthening synergies and utilizing common technical solutions to maximize effectiveness of the whole process.

In particular, sustainable industrial initiatives supported by the following technologies and projects are promoted within ESNII:

- Lead-cooled Fast Reactor (LFR) and the ALFRED project,
- **Gas-cooled Fast Reactor (GFR) and the ALLEGRO project,**
- Sodium-cooled Fast Reactor (SFR).



[About](#)

[Areas of Work](#)

[Projects](#)

[Newsroom](#)

[Events](#)

[Library](#)



*Figure 2: The SafeG project presented at the SNETP and ESNII website*

Active communication and presentation of the project progress and results was secured through Branislav Hatala (VUJE) and Jiří Duspiva (UJV).

Topic related to SafeG were presented at 6 forum meetings between 2020 – 2024, among others at

- ESNII Meeting Task Force n°29 - 31 January 2022 (virtual meeting)
- ESNII Task Force Meeting n°30 - 18 October 2022 (virtual meeting)
- SNETP Forum 2023, 15-17 May, 2023
- SNETP Forum 2024, 17-19 April, 2024

During the ESNII task force meetings, regular updates on progress on the ESNII-relevant technologies, demonstrators and concepts were given. ALLEGRO is one of the ESNII demonstrator reactors, so results of SafeG were a vital part of the regular update presentations on GFR and ALLEGRO in particular. The overall feedback from the ESNII TF members was very positive.

ESNII is one of the pillars of SNETP, and the goal of the annual Forums are to give overview and discuss progress in all the projects endorsed by SNETP pillars. These forums are open to all SNETP members. During the 2023 and 2024 Forums, presentations dedicated to progress of SafeG were delivered, the achieved results shared with the scientific community of SNETP, and very useful suggestions were collected.

## **CONCLUSIONS**

The project is strongly related to various international initiatives, national research activities and projects. Links to these projects were established in the early stage and synergies assured by regular communication and dissemination activities as well as by exchange of information and personal interconnection. Presentation of the project results and interaction with initiatives such as V4G4, GIF, SNETP and ESNII worked not only as a promotion tool of the project and its progress and results, but as an effective channel connecting developers of the ALLEGRO reactor with European and international experts having experience in GFR and HTR research, who utilized their unique expertise, knowledge and experience, bringing fresh ideas to the GFR development to the SafeG project.