

## **Annual Report on the activity of the V4G4 Centre of Excellence association 2016**

The V4G4 Centre of Excellence (V4G4) is governed by the General Assembly (GA) and the Steering Committee (SC). The technical cooperation is organised by the Project Coordination Team (PCT), while legal matters belong to the activity field of the Working Group on Governance and Financing (WGG). The technical activities are concentrating on the ALLEGRO Project (preparatory phase) which was launched by the members of the association in 2015.

### **General Assembly meeting**

The single GA meeting was held in Budapest on May 5. The V4G4 members were all represented at the meeting which was chaired by Á. Horváth (MTA EK).

It was noticed that NCBJ, Poland has a new director, Mr. Krzysztof Kurek, from October 2015 and the corresponding changes of the basic legal V4G4 documents have been carried out.

As the appointments of the earlier Chairman and Vice-Chairman expire in July 2016, new Chairman and Vice-Chairman had to be elected. The representatives of the V4G4 members unanimously elected János Gadó (MTA EK) for Chairman and Peter Liška (VUJE) for Vice-Chairman until July 2019.

### **Steering Committee activities**

The V4G4 SC had two meetings in 2016:

- the 20th meeting held in Budapest, May 5-6 and
- the 21st meeting held in Trnava, September 7-8.

In 2016 the technical progress of the ALLEGRO Project was significant. SC positively evaluated the progress at both meetings. Some details are given in the Section related to PCT activities.

As a consequence of SC activities in 2015, the most difficult legal and organisational issues connected with the Preparatory Phase of the ALLEGRO Project were clarified earlier. The issues remained for 2017 were settled by SC decisions. Unfortunately, the expected joining of CEA to V4G4 as an associated member is still under negotiation.

SC members regularly report on the national activities. As a brief summary one can observe the following facts:

- Beside the SUSEN EURATOM project that may give a significant experimental background to ALLEGRO technical considerations, several smaller projects are running in the Czech Republic contributing to the ALLEGRO Project. Some ambitious projects are under preparation;
- A national nuclear R&D project is running in Hungary (2015-2018) which (among others) covers the Hungarian contribution to the Design and Safety Roadmap of the Preparatory Phase of the ALLEGRO Project;
- The financial background of the Polish contribution has not been ensured until now;
- A very significant contribution to the ALLEGRO Project was financed in Slovakia in 2015. However, the financing of the subsequent plans remained unclear.

As far as EURATOM projects are concerned, the ALLIANCE FP7 project was successfully finished in 2015; the VINCO H2020 project is running and it contributes to a certain extent to ALLEGRO related issues; the V4G4 members and some invited organisations prepared and submitted a H2020 project proposal (ALFA) devoted to ALLEGRO and its evaluation is under progress.

SC extensively dealt with the international contacts including V4G4 representation in various organisations. V4G4 became a key organisation in the GFR/related GIF activities.

The most relevant decisions made by SC can be listed as follows.

#### Decision 20.2

Three proprietary class categories are introduced for documents elaborated by V4G4 members in the ALLEGRO project:

- Proprietary class 1 - for general public and public presentation
- Proprietary class 2 - for V4G4 members and for cooperation of V4G4 members with their national partners
- Proprietary class 3 – for all or specific V4G4 members only (results of experiments, detailed design of equipment etc.)

Proprietary class 1 documents have to be approved by the V4G4 Steering Committee for purposes of ALLEGRO project presentation. Proprietary class 2 documents have to be approved by V4G4 members responsible for their elaboration. Proprietary class 3 is intended for specific projects between two or more V4G4 members. Minutes of SC, PCT and WG meetings belong to Proprietary class 2.

#### Decision 20.4

Two similar logos have to be used: the first one for V4G4 and a second one with the addition of “ALLEGRO Project” for the project. It indicates that V4G4 activities are not restricted to the ALLEGRO Project. The logo development and templates for documents and presentations are to be developed by VUJE (this action has not been completed yet).

The possibility offered by the VINCO project concerning the use of its website is accepted concerning proprietary class 1 documents. The proprietary class 2 and 3 documents will be stored at a website which is under development in VUJE.

Quality management of documents will be provided by that organization where the main author of the given document is employed.

#### Decision 21.1

Experts of the V4G4 members jointly prepare several presentations to the IAEA FR17 Conference to be held in Yekaterinburg in June 2017.

#### Decision 21.2

In order to have an access to the irradiation possibilities at the future MBIR reactor in Dimitrovgrad, Russia, negotiations have to be continued with the Russian partners and a Memorandum of Understanding has to be prepared on the given subject that must not contain any serious obligation, especially related to financing.

#### Agreement signed during the 21th SC meeting

The “General Agreement on Background and Foreground Evaluation Principles for the ALLEGRO Project - Preparatory Phase” was signed during the 21th SC meeting. The value of contributions will be based on a cost estimate proposed by the member organizations participating in the creation of the given contribution and on an importance factor showing the relevance of the contribution to the aims of the ALLEGRO project to be proposed by PCT.

#### **Technical activities (PCT)**

The technical activities of the ALLEGRO Project - Preparatory Phase are organised by the Project Coordination Team.

PCT had three meetings in 2016:

- the 2<sup>nd</sup> PCT meeting, Praha-Řež, February 3-4
- the 3<sup>rd</sup> PCT meeting, Budapest, May 4-5

- the 4<sup>th</sup> PCT meeting, Trnava, September 6-7, preceded by a brainstorming meeting on critical transients to be studied in priority on September 5

The most relevant activities can be summarised as follows.

- creating analytical and research teams in all research institutes of V4G4
- utilization of calculation codes for thermohydraulic and neutronic calculations
- development of input data for relevant calculation codes
- summarising of input data of ALLEGRO demonstrator for thermal hydraulic deterministic analyses
- feasibility study of UOX fuel utilisation at the ALLEGRO
- initiation of power density reduction at the ALLEGRO
- benchmarks of the system thermohydraulics analysis and Neutronic analysis were proposed in the framework of project VINCO (H2020), its solution was initiated
- proposal of research project ALFA in framework of H2020

PCT devoted a special attention to the development of the following basic documents:

- Design Specifications and Objectives
- ALLEGRO fuel related acceptance criteria
- ALLEGRO Safety Specifications and Objectives (Draft)
- Summary of input data of ALLEGRO demonstrator for thermal hydraulic benchmark exercise

The most relevant decisions made by PCT can be listed as follows:

- Accelerate investigations on the possible utilisation of UO<sub>2</sub> pellets instead of MOX pellets in AIM1 cladding
- Accelerate the investigations on finding the appropriate reduced power and/or power density of ALLEGRO core
- Selection of most critical transients for the evaluation of the feasibility of the new core design

Detailed results will be reported mostly in 2017.

The technical co-operation between V4G4 member organisations was significantly improved.

#### **Legal matters (WGG)**

The most important legal issues related to the ALLEGRO Project – Preparatory Phase were settled still in 2015. The two important issues remained were settled in 2016:

- Approval of the “General Agreement on Background and Foreground Evaluation Principles for the ALLEGRO Project - Preparatory Phase” by SC
- SC decision on the proprietary class categories

Both documents were prepared by the WGG, partly during its only meeting in 2016 (Budapest, May 5) and partly by mail exchanges.

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