

**Report by  
the Scientific Advisory Committee of  
the Center of Accelerators and Nuclear Analytical Methods (CANAM)  
at the Nuclear Physics Institute, Academy of Sciences of the Czech Republic,  
project code LM2011019.**

## **Introduction**

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The CANAM Scientific Advisory Committee (SAC) is appointed by RNDr. Petr Lukáš, C.Sc, director of the Nuclear Physics Institute, Academy of Sciences of the Czech Republic. The committee reports to the main CANAM Coordinator Ing. Jan Dobes, CSc., and to Dr. Petr Lukáš.

*The committee consists of*

Assoc. Prof. Dr. Ir. Peter Bode, Delft University of Technology, The Netherlands, Chair  
Dr. Pavel Yu. Apel, JINR, Dubna, Russian Federation  
Assoc.Prof. František Bečvář, DrSc., Charles University, Prague, Czech Republic  
Prof. Dr. David Rafaja, Technical University Bergakademie Freiberg, Germany  
Prof. Dr. Jan John, Czech Technical University Prague, Czech Republic  
Dr. Jiří Kopecký, JUKO Research, Alkmaar, The Netherlands  
Dr. François de Oliveira Santos, GANIL, Caen, France  
Doc. Dr. Václav Švorčík, Institute of Chemical Technology Prague, Czech Republic

## **Terms of Reference**

1. Progress Report on the Implementation of the Project of Large Research, experimental Development and Innovation Infrastructure CANAM in 2012
2. Progress Report, Attachment 1, List of experimental projects of the infrastructure
3. Progress Report, Attachment 2, List of publications of the infrastructure
4. Progress Report, Attachment 3, List of collaborations
5. Progress Report, Attachment 4, List of collaborations with other infrastructures in the field
6. Progress Report, Attachment 5, List of organizations and seminars
7. Progress Report, Attachment 6, List of International grants and their short characteristics
8. Progress Report, Attachment 7, List of the investments of the infrastructure
9. Progress Report, Attachment 8, Organization structure of the infrastructure
10. Progress Report, Attachment 9, List of the scientific expert panel members
11. Attachment A, Real financial costs of the project in 2012
12. Attachment B, Table of indicators for monitoring of the implementation of the project

## **Evaluation Procedure**

All members of the SAC received the documents listed under 'Terms of Reference' , serving as a basis for the evaluation. The SAC members Bode, Apel, Bečvář and Rafaja have visited the Nuclear Physics Institute on October 15 2013 for a joint meeting of the SAC and the Scientific Selection Panel (SSP) of the CANAM infrastructure . During this visit, presentations were given by the CANAM coordinators on the infrastructure and scientific projects, followed by good and open discussions. In addition, a visit to the CANAM laboratories (Cyclotron and Fast Neutron Generators, Tandetron and Neutron Physics Laboratory and the Řež reactor) provided an opportunity to familiarize with the status of the infrastructure. During a closed session on October 16, 2013, the four members of the SAC discussed their observations, conclusions and recommendations, which were presented to the CANAM

management and the CANAM coordinators which had an opportunity to provide a first reaction. The draft version of this report has been distributed to all SAC members for comments, on basis of which this final version has been compiled.

## Conclusions

The SAC concluded

- CANAM is an encouraging initiative of the government of the Czech Republic to foster nuclear sciences using accelerators and nuclear research reactors, to provide an outlook for further expansion and development and, without limitation to borders, to strengthen the utilization of the CANAM facilities for the needs of other sciences, technology and engineering.
- CANAM and its facilities is built on, and managed by a team of internationally respected scientists who possess good national and international cooperation and contacts.
- CANAM has several instruments that are unique in Central Europe, such as the neutron diffractometer with high resolution, the PIXE facility and the fast neutron generators; similarly, the radiochemical neutron activation analysis group is one of the very few in the world and well renowned.
- The results after the first project year 2012 provide satisfactory prospects that the overall objectives of this 2012-2016 project will be reached, and that most of the projected performance indicators will be satisfied.
- The SAC highly appreciates that results reached by CANAM address, among others, the issues very close to fundamental research at the intersection of several branches of science and technology.
- Many publications on the results of research, done with CANAM's infrastructure, have been published in international peer reviewed scientific journals with science citation impact factors that belong to the highest for the related disciplines. In this respect, the CANAM team clearly benefits in many fields from its national and international scientific network.
- However, neither the documents listed under 'Terms of Reference' nor the presentations during the joint SAC and SPP meeting revealed a clear and systematic focus in the research performed by the local scientific staff outside the scheme of open access to CANAM infrastructure.
- CANAM has an opportunity during the project period 2012-2016 to develop towards a major central European multi-user facility for accelerator and research reactor-based science and applications. Sustainability of the current project after the year 2016 requires already timely anticipation and a strategic plan.

## Recommendations

### **Strategy**

A strategic plan 2017-2022 is timely needed for entering the period after the year 2016. Such a strategic plan requires a self-reflection on the existing capabilities of CANAM, potential future capabilities, an evaluation of current and future stakeholder's requirements, a SWOT (Strength-weakness-opportunities-threats) analysis and an implementation plan.

To maintain momentum, a first draft strategic plan should be available by the midst of the year 2014 for evaluation by the SAC. A final strategic plan can then be presented to the principal stakeholder (the Ministry of Education, Youth and Sports of the Czech Republic and Nuclear Physics Institute of the Academy of Science of the Czech Republic) and the other main stakeholders by the end of the year 2015.

### **Stakeholders**

CANAM has to map and contact its main stakeholders as part of the strategic plan development, and find ways to expand on them. Partnership in existing European networks of large nuclear (and related) facilities is strongly recommended. It requires an evaluation of the uniqueness of CANAM's infrastructure, positioned as complementary to the existing European facilities. The existing designation as partner organisation in the NMI3 consortium might be fruitfully employed in this.

CANAM has to evaluate its logistics from the viewpoint of external users, in particular users from other countries. This starts with transparency in the process of proposal submission, compliance with the timeline of proposal evaluation and the period of availability of the facilities, and includes also housing facilities for the users and overcoming remaining language barriers at all stages.

### **Marketing**

The SAC strongly recommends CANAM to orientate, develop and implement a marketing strategy and associated campaign. This is already needed for the remaining time of the current period and therefore should be considered as of high priority for the next six months. It should be noted that marketing also requires a professional follow-up, with full compliance to what is offered.

The experiences with the marketing can thus be used for the marketing in the strategic plan for the period 2017-2022

### **Outreach**

CANAM is recommended to seek publicity with results of the use of its facilities that have impact to society, environment, health and sustainability, thus demonstrating the relevance of this investment.

### **Scientific Staff/ Own research**

CANAM has to define

- The main focus and topic of its own research with the facilities. This should also be clear to potential users of the infrastructure.
- The proportion of its own research (including the methodical development of the existing facilities) and research made in scientific cooperation with external users. The latter could be also interpreted as a 'user facility' and the external applicants may either be facilitated by CANAM staff or use the facilities entirely by themselves (user facility).
- The proportion between the (own) research and the scientific service. Scientific service also implies that the facilities should be made available for studies required by industry.

CANAM also has to evaluate the age structure of its scientific staff and instrument responsables, for timely measures to ensure this part of the viability of all facilities on the medium term. This may require the development of a strategy towards stronger involvement in the national university curricula so as to evoke interest with their students.

### **Quality assurance at CANAM**

CANAM is recommended to develop and to announce criteria for evaluation of the proposals, and to have at least two evaluators for each proposal. In addition, feedback should be sought with the users on the completion of the research activities.

### **Upgrading the infrastructure**

CANAM is recommended to evaluate the need for expansion of its infrastructure. This will be also part of the strategic plan 2017-2022 as it requires, to some extent, also insight in future stakeholder's needs. However, CANAM may also decide by itself on this. The SAC suggests to consider – though not be limited- positron lifetime spectroscopy, high resolution mass spectrometry, and neutron imaging as reasonable extensions of the existing facilities.

### ***Progress reports***

The SAC recommends the following improvements for future progress reports:

- Papers should only be cited if they have appeared; not when submitted.
- The science citation impact factors of the journals should be added.
- The list of proposals accepted should provide reference to the collaborating institutions and publications.

### **Final remarks**

4 The SAC suggests to arrange the next meeting in the last semester of 2015. The evaluation and communication of the draft strategic plan will be done by email correspondence.

The committee will appreciate it when:

- CANAM's management will also communicate with the SAC on the accomplishments in 2013 and 2014 via the annual progress reports.
- The project management provides feedback on actions taken following this first advisory report.

Sunday, 27 October 2013