

ECC-SMART

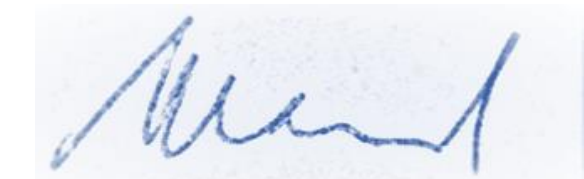
Project Newsletter

March 2021

Dear fans of development in the nuclear field!

The ECC-SMART team would like to get you familiar with the ECC-SMART project – the first joined the transcontinental initiative in the development of the Supercritical-Water-Cooled Small Modular Reactor (SCW-SMR), covering most of the Generation IV International forum countries involved in the development of the SCW-SMR. The project was supported by the European Commission in 2020 (from the call NFRP-2019-2020-05 - Support for safety research of Small Modular Reactors) with an overall budget of 8 911 950 € (and EC contribution of 3 997 238 €) starting on September 1st 2020 with the total duration of 48 months. Despite the fact that we have to face the current pandemic situation, the project is on track with no delays.

As coordinator, I'd like to express my deepest appreciation to my colleagues for handling the situation with grace and a positive approach and wish us all the "good old days" to be back (at least partially) soon!



Markéta Kryková

Sincerely,

INTRODUCTION

Nuclear energy has an important role to play in the effort to reduce dependence on the combustion of fossil fuels for electricity. Nuclear reactor designs are categorised according to 'generation', with Generation IV being currently under development and deployment. An international task force is collaborating to develop six nuclear reactor technologies for deployment between 2020 and 2030, among them the supercritical water-cooled reactor. One of the main challenges is the demonstration of its passive safety systems.

The EU-funded ECC-SMART project is addressing this challenge by assessing the feasibility of a small modular reactor cooled by supercritical water and identifying its passive safety features. The project encompasses the design and pre-licensing requirements as well as a roadmap for demonstration of safety.

WHY THE SUPERCRITICAL WATER-COOLED SMALL MODULAR REACTOR (SCW-SMR)?

- Based on the SCWR research worldwide
- Need for flexible power source for wide range of users
- Passive safety
- Water-cooled design
- Reaching the GIF requirements*
- Lower capital costs
- Higher efficiency

DESIGN REQUIREMENTS FOR THE FUTURE SCW-SMR

Objective: collect all experience from design studies in EU, Canada and China to derive a joint design requirements document following the design targets:

- ✓ The specific plant erection costs (€/kW installed electric power) should be less 20% compared with SMR concepts based on a PWR.
- ✓ The power plant shall remove the residual heat without the need of electric power at least within a time period of 3 days.
- ✓ The specific fuel cost (€/MWh electric power) shall be smaller than those of SMR concepts based on a PWR, which may be accomplished by a higher efficiency compensating higher fuel production costs.
- ✓ The electric power output of the SMR should be around 200 to 300 MW.

ECC-SMART PROJECT GOALS AND MISSION

The ECC-SMART is oriented towards assessing the feasibility and identification of safety features of an intrinsically and passively safe small modular reactor cooled by supercritical water, taking into account specific knowledge gaps related to the future licensing process and implementation of this technology.

The main objectives of the project are:

- 🌀 Define the design requirements for the future SCW-SMR technology
- 🌀 Develop the pre-licensing study and guidelines for the demonstration of the safety in the further development stages of the SCW-SMR concept including the methodologies and tools to be used
- 🌀 Identify the key obstacles for the future SMR licencing
- 🌀 Propose strategy for this process

To reach these objectives, specific technical knowledge gaps were defined and will be assessed to achieve the future smooth licensing and implementation of the SCW-SMR technology (especially behaviour of materials in the SCW environment and irradiation, validation of the codes and design of the reactor core will be developed, evaluated by simulations and experimentally validated).

JOINT EUROPEAN CANADIAN CHINESE DEVELOPMENT OF SMALL MODULAR REACTOR TECHNOLOGY



This project has received funding from the Euratom Research and training programme 2019-2020 under Grant Agreement No 945234.



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FIND OUT MORE!



ecc-smart.eu



[ECC-SMART LinkedIN](#)

CORDIS
EU research results

[Cordis \(ID945234\)](#)

JOIN ECC SMART AT:

ISSCWR-10

The 10th International Symposium
on Supercritical Water-Cooled Reactors
15th – 19th March, 2021
Prague, Czech Republic



PROJECT CONSORTIUM

20 partners: 15 from Europe, 3 from China, 1 from Canada and 1 from Ukraine



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