

LD-SAFE

Laser Dismantling Environmental and Safety Assessment

OBJECTIVES

Validate the laser cutting technology for the dismantling of the most challenging components of power nuclear reactors in air and underwater. Demonstrate that the in-air and underwater laser cutting technologies are a relevant alternative to the conventional techniques used for the segmentation of the power nuclear reactors internals (RVI) and pressure vessels (RPV). The following 4 specific objectives aim to prove that the technology is mature :

- Objective 1: Demonstration of the technical capabilities of the laser cutting technology to address the key challenges of the dismantling of power nuclear reactors RVI and RPV.
- Objective 2: Environmental and safety assessment for the implementation of laser cutting in nuclear reactor environment and definition of countermeasures.
- Objective 3: Validation of technology in operational environment, with in-air and underwater demonstrators including the safety system, confirming that TRL 7 is reached (Technology Readiness Level).
- Objective 4: Demonstration of the economic advantage of using the laser cutting technology for RVI and RPV dismantling.

EXPECTED IMPACTS

Thanks to the progresses which will be made reality at the end of the project, the global ambition of the LD-SAFE project is to provide the tools to the European industry to create a robust world-leading decommissioning sector based on EU safety culture and know-how.

The LD-SAFE project proposes an innovation which could enhance the safety, economic and technical aspects of one of the most challenging tasks of power nuclear reactor dismantling. By improving the segmentation of power nuclear reactors RPV and internals, the project would contribute to encourage the immediate dismantling strategy, which better complies with the contemporary and future societal, environmental and economic standards.

This action has the opportunity to support European RTO and industry in remaining a step ahead in the development of this technology by achieving a world first laser dismantling of a power nuclear reactor.

HIGHLIGHTS

- Analysis of reactor dismantling with laser cutting: Produce analysis and specifications for the safety assessment, the tests and the demonstrators included in the work program.
- Laboratory tests and calculations: Assess and mitigate the environmental and safety impact of the laser cutting technology applied to the dismantling of reactor components.
- Protection of the workers and the environment: Activity focused on conventional health & safety and environmental impact. One of these aspects is the laser safety, which is specific to the technology used.
- Safety: Development of a risk analysis for the implementation of the laser technology for the cutting of the reactor components and of a Generic Safety Assessment including answers to the known safety concerns of the stakeholders.
- Case study and demonstrator: Validate the implementation of the technology in reactor environment at TRL7. To ensure representativeness of the demonstrator, a case study will be developed incorporating the previous results of the LD-SAFE projects and the point of view of the stakeholders. In particular, the demonstrator will include both in-air and underwater cutting of mock-ups of relevant components (internals and RPIs).
- Dissemination, exploitation, education and training activities: This activity contains strong connections to the project outcomes, as the dissemination and education activities are based on exploitation and communication of the outputs of the project.

PARTNERS

ONET TECHNOLOGIES / CEA / TECNUBEL / LLOYD'S REGISTER / TECNATOM / IRSN

CONTACTS

Technical Project Leaders:

Damien ROULET (ONET TECHNOLOGIES, Coordinator)
Email: rouletd@onet.fr

Pierre DAGUIN (ONET TECHNOLOGIES, Project Manager)
Email: pdaguin@onet.fr

DURATION & BUDGET

07/2020 to 06/2024 (4 years)
2 799 112€ (maximum contribution from European Commission)

EVENTS

Two stakeholder workshops will be organized: The first at the beginning of the project (in 2020) and the second at the end of the project (in 2024). While the first technical workshop will aim at presenting the project to the stakeholders and sharing views with them about the use of laser cutting for reactor dismantling, the second technical workshop will aim at disseminating the results of the project both to industry, academics and RTOs.

