

PLEIADES

Smarter Plant Decommissioning



PLEIADES, the Smarter Plant Decommissioning

PLatform based on Emerging and Interoperable Applications for enhanced Decommissioning processES

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PLEIADES: Introduction

- Platform based on Emerging and Interoperable Applications for enhanced Decommissioning processES
- Call for projects: H2020 NFRP-2019-09 – “Fostering innovation in decommissioning of nuclear facilities”
- Coordinator : CEA
- Total cost : 4.3M€
- EU funding : 2.8M€
- Duration: 3 years (01/10/2020 - 30/09/2023)

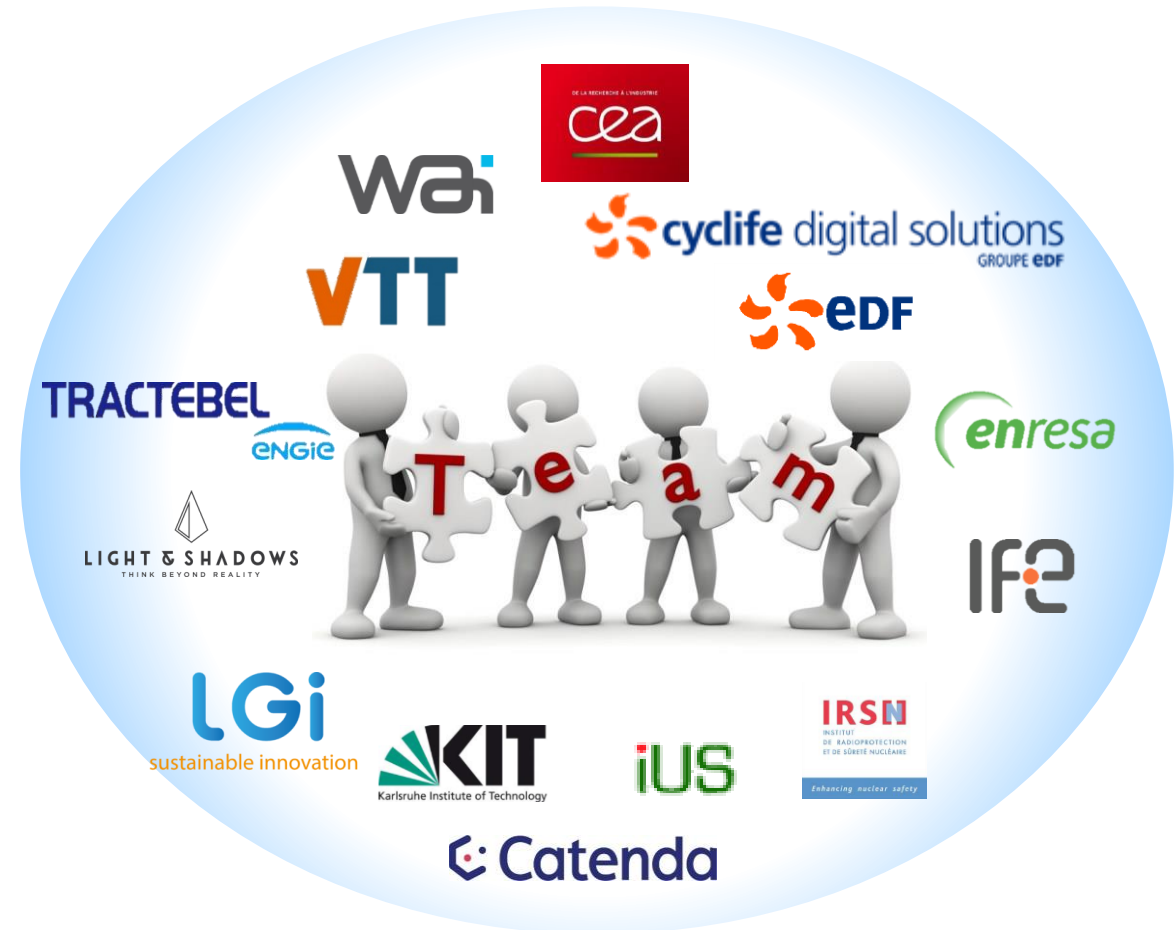


PLEIADES: Team

- 14 partners
from 7 countries:
FR (6), DE (2), NO (2), ES (1), FI (1),
BE (1), SK (1)

CEA	Commissariat à L'Energie Atomique et aux Energies Alternatives	R&D	FR
EDF	Electricité de France	Industry	FR
ENRESA	Empresa Nacional de Residuos Radioactivos SA	Industry	ES
IFE	Institutt for Energieteknikk	R&D	NO
IRSN	Institut de Radioprotection et de Sûreté Nucléaire	TSO	FR
IUS	iUS Institut für Umwelttechnologien und Strahlenschutz GmbH	SME	DE
KIT	Karlsruher Institut für Technologie	ACADEMIA	DE
LGI	LGI Consulting	SME	FR
LS	Light and Shadows	SME	FR
CYCLIFE	Cyclife Digital	Industry	FR
CATENDA	Catenda AS	SME	NO
VTT	VTT Technical Research Centre of Finland Ltd	R&D	FI
TRACTEBEL	Tractebel Engineering S.A.	Industry	BE
WAI	WAI s.r.o.	SME	SK

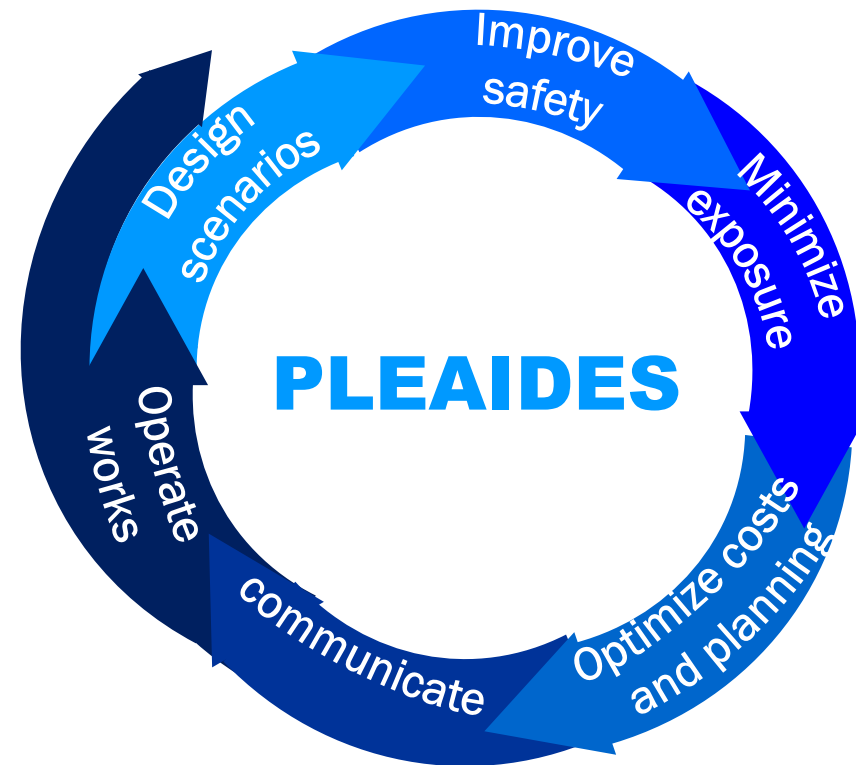
SME: Small & Medium size Enterprise
TSO: Technical Safety Organisation



PLEIADES: Objectives

✓ Develop an innovative platform based on a BIM approach

→ BIM (*Building Information Modelling*) approach to **design scenario**, **improve safety**, **minimize radiation exposure**, **optimize costs and planning**, **communicate**



PLEIADES: Objectives

✓ Develop an innovative platform based on a BIM approach

→ BIM (*Building Information Modelling*) approach to **design scenario, improve safety, minimize radiation exposure, optimize costs and planning, communicate**

→ 3D modelling & simulation

→ “multi-dimensional modelling”: **3D model, time, dose, feasibility studies, waste and costs**

→ Software **integration** and **interoperability**

Data/info
acquisition and
management

Characterization
and Job planning

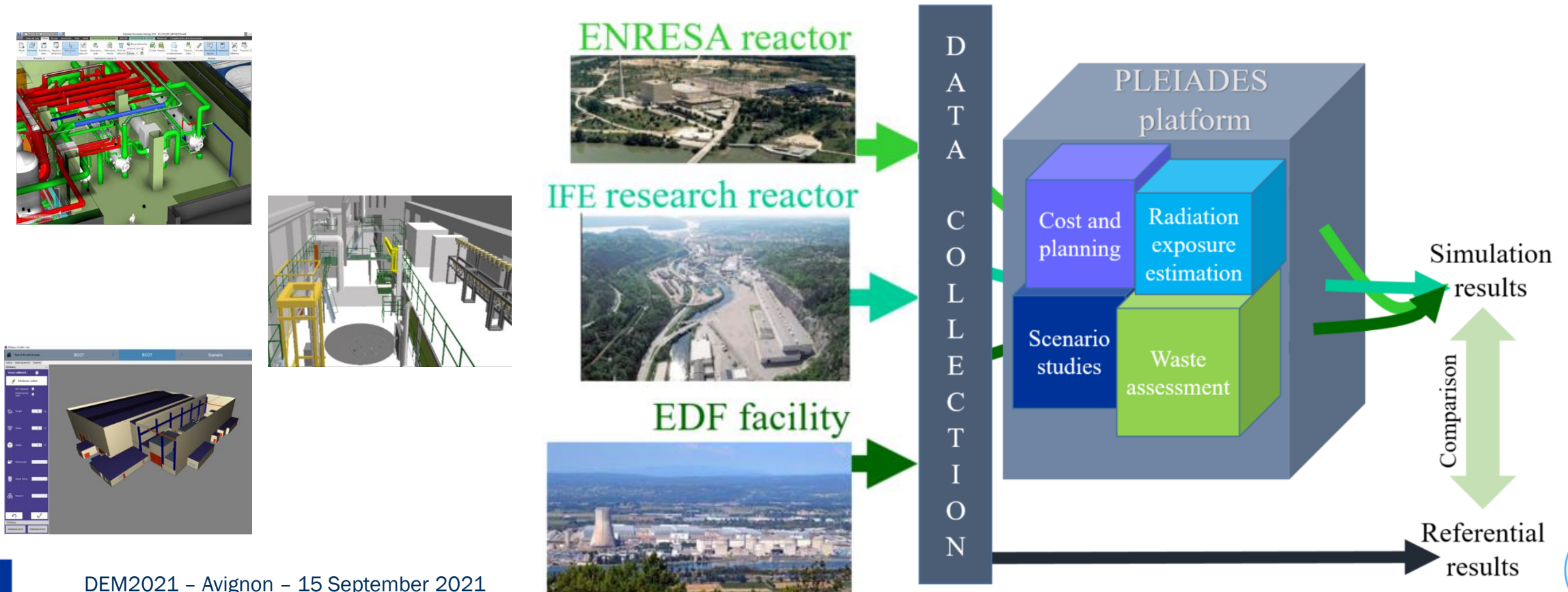
Decisions, Costing,
Waste management

Demonstration
and Training

1. **3DScanPF (KIT)**: Robotic platform for 3D scans and imaging
2. **DIM (EDF)**: Dismantling Info Modelling system for storing all facility data
3. **Bimsync (CATENDA)**: IFC¹ compatible BIM platform used in construction
4. **iUS IMS (iUS)**: Semantic wiki based nuclear info system
5. **RadPIM (IFE)**: Radiological characterisation tool (part of VRdose family)
6. **VRdose (IFE)**: Detailed job planning tool with a radiological model library
7. **DEMplus (CYCLIFE DS)**: Decision-support tool combined with 3D simulation
8. **Aquila costing (WAI)**: ISDC² compatible client-server based costing tool
9. **iDROP (CEA)**: VR dismantling simulation with collision & radiological modelling
10. **LLWAA-DECOM (Tractebel)**: Low Level Waste Activity Assessment tool
11. **ALVAR (VTT)**: AR³ training platform with advanced tracking capabilities
12. **INTERACT (LS)**: XR⁴ platform with physics engine

PLEIADES: Objectives

- ✓ Develop an innovative platform based on a BIM approach
- ✓ Implement on real cases



PLEIADES: Objectives

- ✓ Develop an associated methodology and prepare it as a standard
 - Establish a **standardized process** to organize the data collected consistent with BIM approach
 - Propose an **ontology** for an international standard:
 - decommissioning specific terminology / vocabulary definition
 - concepts relationships identification
 - common understanding
 - common knowledge modeling

PLEIADES: Objectives

✓ Develop an associated methodology and prepare it as a standard

✓ Prepare the exploitation of the PLEAIDES outcomes

→ **Promote** the application of PLEIADES in nuclear decommissioning

→ Define the **exploitation** strategy :

- commercialization entity creation
- business plan

→ Education & **training** preparation

PLEIADES: Highlights

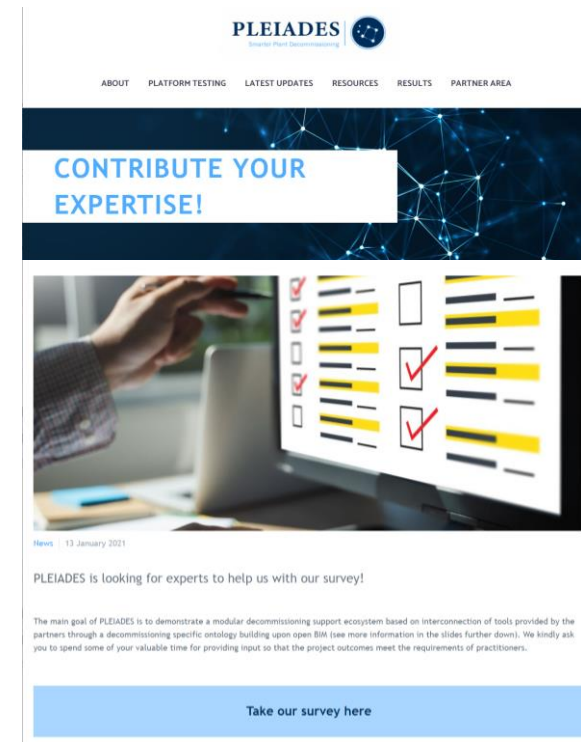
✓ Requirements and Specifications

→ Analysing requirements and eliciting specifications

Inputs for:

- designing the PLEIADES software architecture
- main technical developments
- demonstration tests

1. Online questionnaire based survey
2. Dedicated work session on the DigiDecom 2021 workshop
3. Analyse of requirements collected



PLEIADES: Highlights

✓ Requirements and Specifications

✓ Needs identification

→ Needs mostly focused on:

- 3D/BIM based **inventory** management with focus on risks (e.g. radiological risks)
- Scenario simulation for **analysis/optimisation** of work plans
- **Safety and risk** management
- **Waste** route planning

PLEIADES: Highlights

✓ Requirements and Specifications

✓ Needs identification

✓ Tests preparation: development of 6 user stories

→ Validation tests

→ Test protocols

→ Basis for tests to demonstrate the capabilities of the PLEIADES prototype

PLEIADES: Highlights

✓ Requirements and Specifications

✓ Needs identification

✓ Tests preparation: development of 6 user stories

✓ Development of ontology

→ A nuclear decommissioning specific ontology

→ For **harmonization of knowledge management** within nuclear decommissioning

PLEIADES: Next Steps

✓ Development of the PLEIADES software architecture

- 2021 leader: Vincent PERROT (CEA)

✓ Prototyping of the PLEIADES software platform

- up to June 2022 leader: Vincent PERROT (CEA)

✓ Demonstration/validation of the platform in the 6 user stories

- 2022 leader: Bérangère CLERE (Cyclife-DS)

✓ Results evaluation (platform & modelling results)

- 2023 leader: Markus AIRILA (VTT)

Thank you for your attention



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