

DEM&MELT

An Innovative In-can
Vitrification Process



Full-scale pilot fully commissioned in 2020

**A ROBUST, SIMPLE, AND VERSATILE
IN SITU VITRIFICATION PROCESS
FOR D&D AND REMEDIATION WASTE**



DEM&MELT

A ROBUST, SIMPLE AND VERSATILE IN SITU VITRIFICATION PROCESS FOR D&D AND REMEDIATION WASTE

- Compact enough to be implemented in a decommissioned cell or close to the waste to be treated
- Low investment and operation costs
- Canister used as the melter—**no pouring device, no corrosion issue**
- Heated by a simple and robust resistance furnace
- Optimum homogeneity to the melted mixture
- Efficient temperature control and volatility management
- Highly efficient off gas treatment system
- Suitable for solid or liquid waste, **including zeolites and sludge**
- Flexible enough to accommodate uncertainties in waste composition
- Designed to produce a small amount of secondary waste

IN-CAN VITRIFICATION PROCESS

An innovative solution for treating intermediate and high level waste arising from remediation and D&D.

DEM&MELT operates within a compact unit, ensuring:

- **SIGNIFICANT VOLUME REDUCTION**
- **SAFE CONTAINMENT OF RADIONUCLIDES**
- **WASTE STABILIZATION**

DEM&MELT has a modular design, fully adaptable to nuclear operators' requirements

AN **OPTIMIZED** WASTE TREATMENT SOLUTION **DESIGNED FOR A WIDE RANGE OF WASTE:**

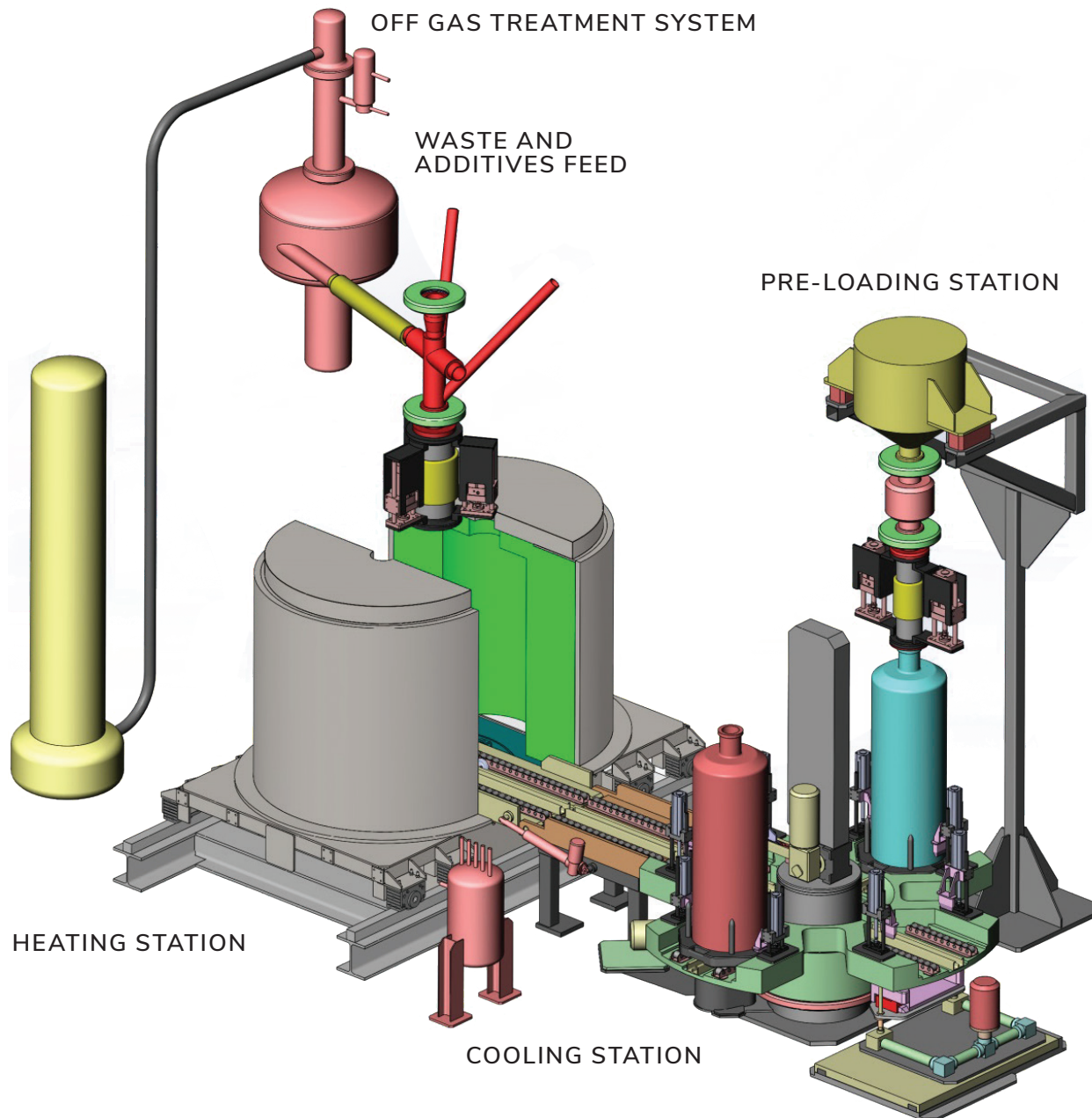
- ZEOLITES
- LIQUIDS
- DEPOSITS
- SOLIDS
- SLUDGE

The DEM&MELT project offers a full and integrated solution, ranging from scenario studies and matrix design definition to industrial implementation.



DEM&MELT

IN-CAN VITRIFICATION PROCESS



DEM&MELT design benefits from mature and proven technologies, from upstream functions to downstream functions.

Over 40 years of HA operation at La Hague and Marcoule

Most of the functions are already qualified and can be rated **TRL9**:

- Off-gas treatment system
- Can and final package management functions including handling, supply, evacuation, contamination control, and welding
- Remote-controlled operation and maintenance functions
- Glass formers feeding
- Auxiliary functions



Innovative solutions for waste treatment

PARTNERSHIP ORGANIZATION:



CEA: Project management, glass matrix formulation, material studies, development and qualification of the process



orano

Orano:
Process design,
nuclearization
and valorization



ECM
TECHNOLOGIES

ECM:
Designing and
manufacturing
the furnace



Andra: Co-funder of the project through the French government program, *Programme d'Investissements d'Avenir*



The DEM&MELT project is a partnership between Orano, CEA, ECM technologies and Andra, supported by the French government's future investment program: Programme d'Investissements d'Avenir

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