

# Calciner

## Advantages of the Orano calciner:

### 1. UNPARALLELED EXPERIENCE.

We continuously and successfully perform calcination and vitrification almost **every day of the year** at la Hague, with six treatment lines and minimal down times

### 2. MATERIALS EXPERTISE.

Our capability to effectively treat concentrated HLW, one of the **most difficult waste streams**, demonstrates our expertise in materials treatment

### 3. FACILITIES.

In addition to our operating facilities, we have facilities with inactive equipment that allow us to **experiment** with treatment of new materials, **optimize** operations, and **practice** routine and non-routine operational and maintenance activities

### 4. STABILITY.

We produce waste forms that are demonstrated to be **optimized** with waste loading, **stable** over long periods of time, designed for **ease of handling**, and devoid of material requiring IAEA safeguards

### 5. INNOVATION.

We have spun off effective miniaturized processes for waste treatment (e.g., DEM&MELT) using our **extensive experience**

## Treatment of waste into a more stable form

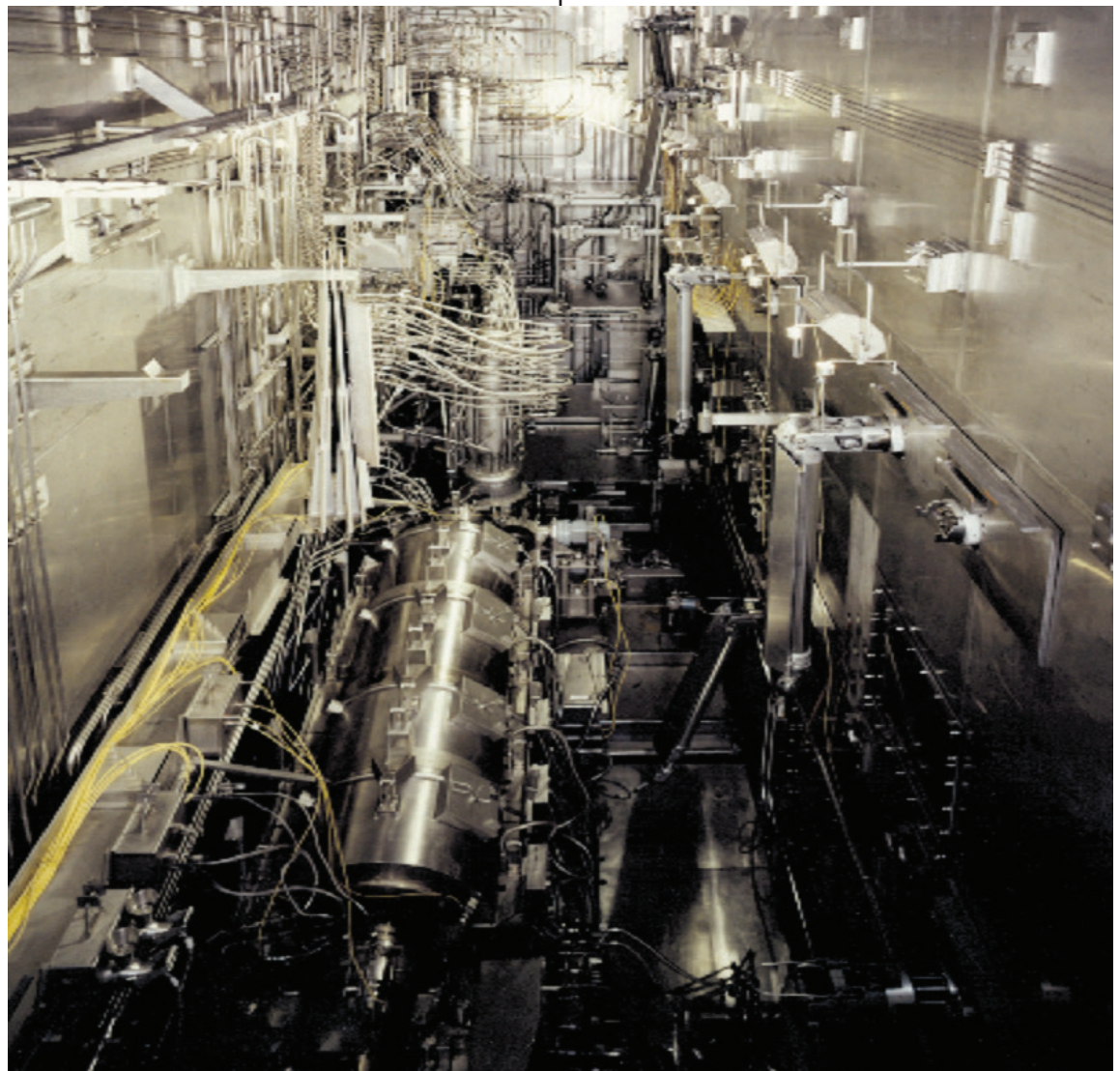
The Orano la Hague treatment plant is designed to treat up to 1,700 MTHM per year of used nuclear fuel. These reprocessing operations create liquid waste, which—instead of being stored on the site—is dried and vitrified using six separate calcine/vitrification lines. Each line employs a calciner that rotates the material throughout its length to ensure it is uniformly conditioned by the heating elements of the calciner.

After being dried, the calcined waste is mixed with glass frit and added to a melter, which vitrifies the dried waste into a solid glass matrix that can be:

- Safely and robustly stored
- Easily handled
- Released from safeguards protection

Some typical Orano calciner specifications are:

- Tube diameter: **1 foot** (without insulation)
- Length: **10 feet**
- **Four** independent joule heated zones



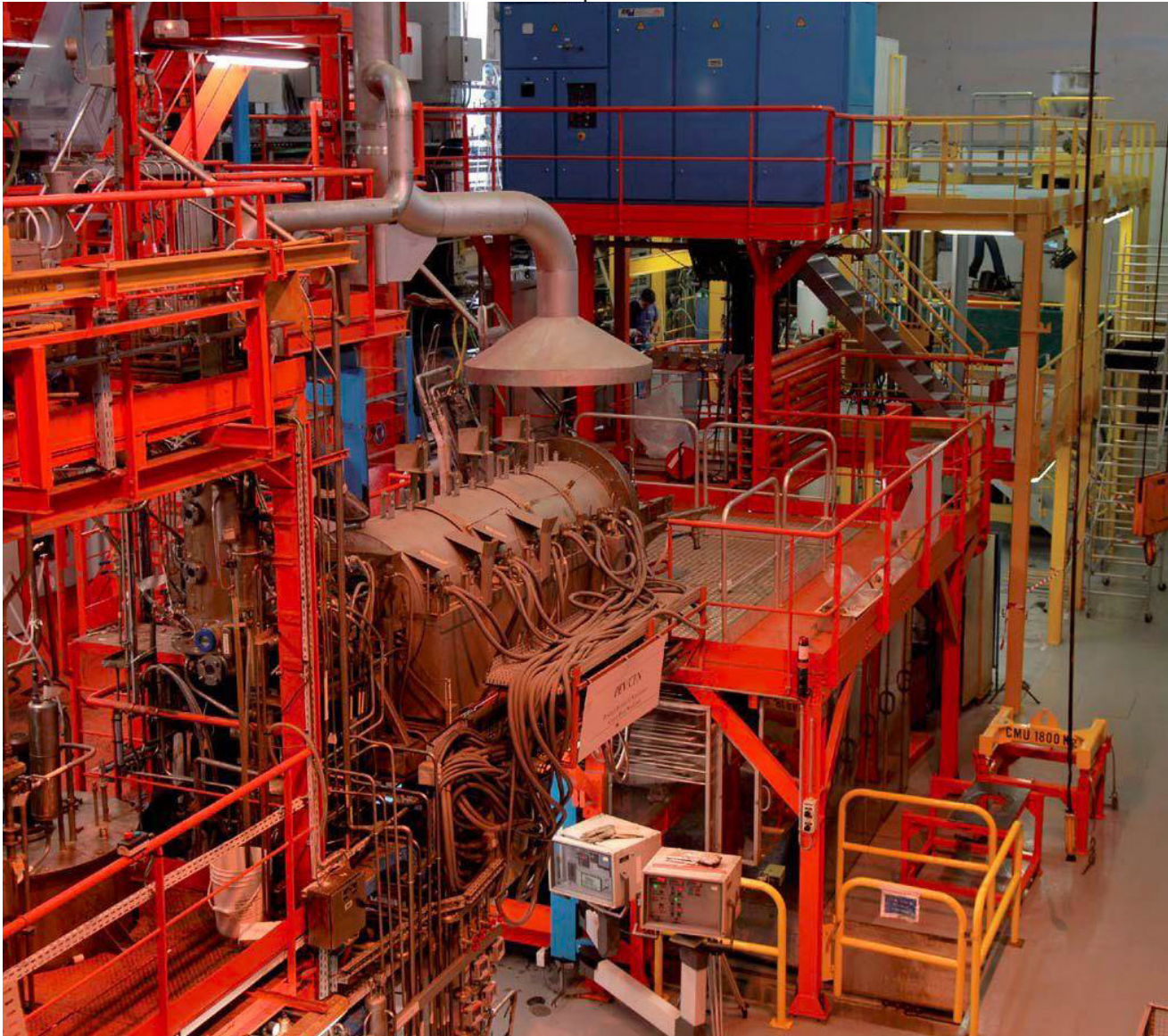
The high level waste calciner at the Orano la Hague vitrification plant

## Orano Calciner

- Processes approximately **30-40 gallons per hour** of aqueous feed HLW
- **85% to 90% availability** each year

Orano has a complete set of validated modeling and simulation programs to optimize performance of calciners.

The vitrification lab in Marcoule, France (a CEA and Orano joint venture), has an inactive (uncontaminated) calciner used to perform full-scale simulant tests, demonstrate and/or optimize the operation of calciners, and provide a means to troubleshoot, as and when necessary, calciner operations.



The Marcoule Joint Vitrification Laboratory (LCV) with inactive calciner

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