

The TRIGA International Production Line in Romans, France

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Framatome CERCA introduction

Identity, history and industrial relaunch

For over 65 years, Framatome's teams have been involved in developing safe, competitive, clean, low-carbon nuclear energy worldwide by :

- designing nuclear power plants,
- supplying and commissioning nuclear steam supply systems,
- designing and manufacturing components and fuel assemblies,
- designing, manufacturing, integrating and maintaining I&C systems,
- and servicing all types of nuclear reactors.

- **€5.4 billion** revenue in 2025
- Order book **> €28 billion**



The original equipment manufacturer of **105** nuclear power plants.

Experience acquired on **more than 380 reactors**, thanks to services supplied and maintenance

CERCA, Compagnie pour l'Etude et la Réalisation de Combustible Atomique

Founded in 1957 to develop and industrialize uranium metal alloys to manufacture fuel elements for research reactors and manufacture irradiation targets for medical use.

- Manufacturing of fuel elements for research centers, research reactors and universities,
- Manufacturing of medical targets which after irradiation in research reactors enable cancer screening and treatments,
- Logistic services for uranium transport,
- R&D programs for advanced fuels.

Today, CERCA's division of Framatome employs more than 180 employees and operates 2 locations in France



CERCA



Key dates

Founded in 1957

1959: CERCA plant started

1988: 1st HALEU U_3Si_2 conversion

1992: Framatome acquires CERCA shares

1995: TRIGA International Joint Venture

2005: 1st TRIGA HALEU conversion

2015: Integration into Framatome

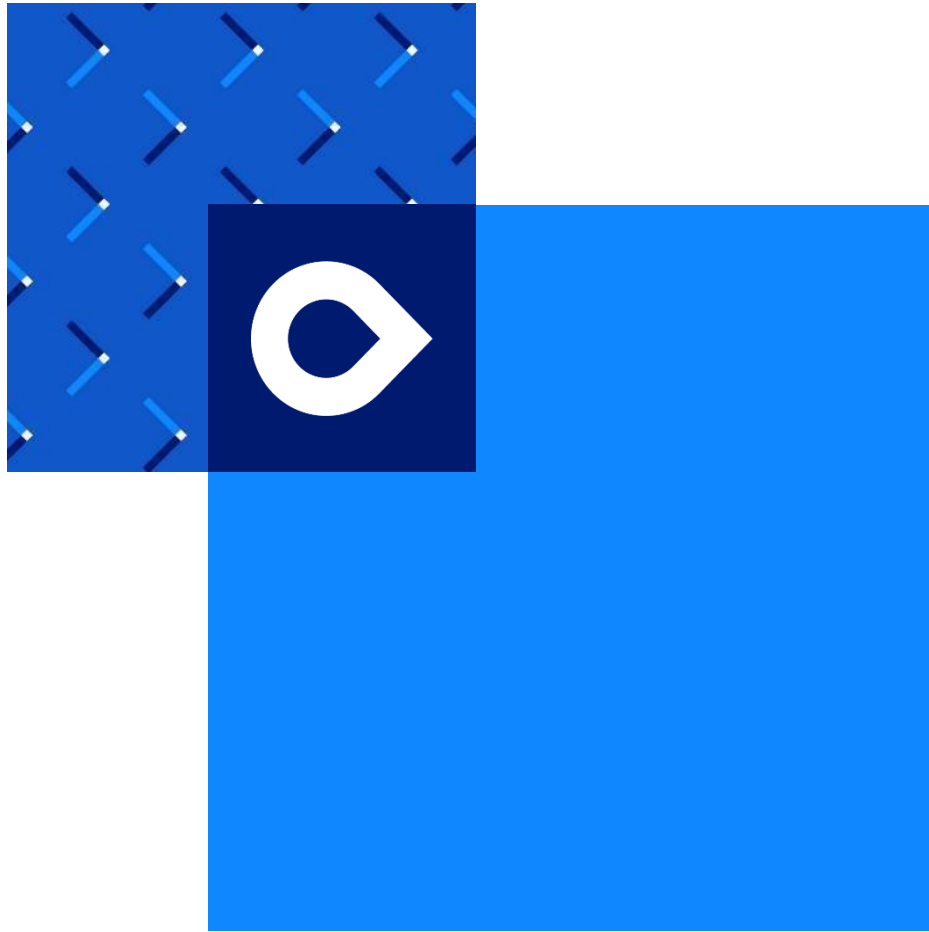
2016: New plant financial investment date

2019: Inauguration of the CERCA Research & Innovation Laboratory (CRIL)

CERCA

Our products delivered on the 5 continents for 20 years





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TRIGA International Overview

TRIGA FUEL FABRICATION FACILITY

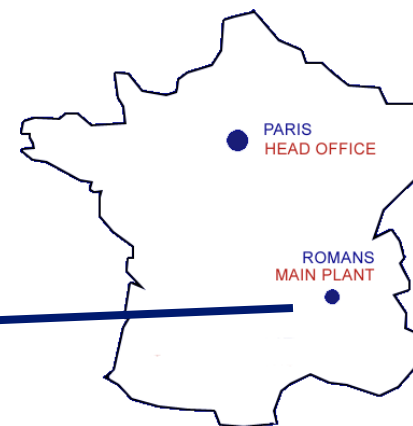
Consolidation for a Sustainable Supply

From 1958 to 1995 all TRIGA fuel was fabricated at the General Atomics campus in San Diego

Reduced fuel element demand and increasing licensing fees forced GA to investigate relocating the fuel fabrication facility.

TRIGA International, SAS (TI) was founded

All TRIGA fuel is now fabricated at the TRIGA International facility in Romans (France)



TRIGA International at a Glance

TRIGA International is a 50-50 joint venture created in 1995 by Framatome and General Atomics

The CERCA division of Framatome is the operational entity in charge of the TRIGA fuel production. CERCA produces all types of research reactor fuel worldwide

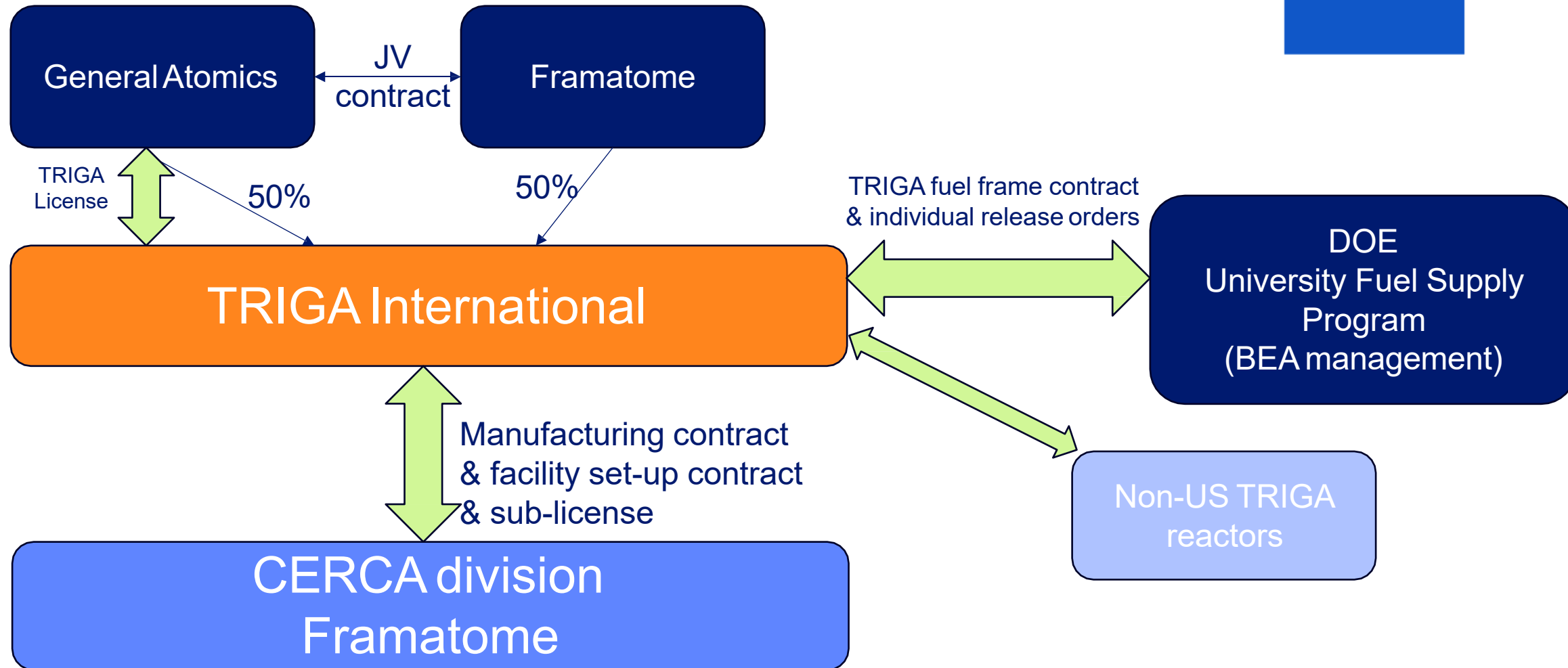
GA granted a license to TRIGA International for the TRIGA fuel manufacturing know-how.

TRIGA International has a frame contract with the University Fuel Supply (UFS) program of DOE to manufacture different types of TRIGA fuel for the US universities need.

CERCA has a manufacturing subcontract with TRIGA International including a sub-license for TRIGA fuel



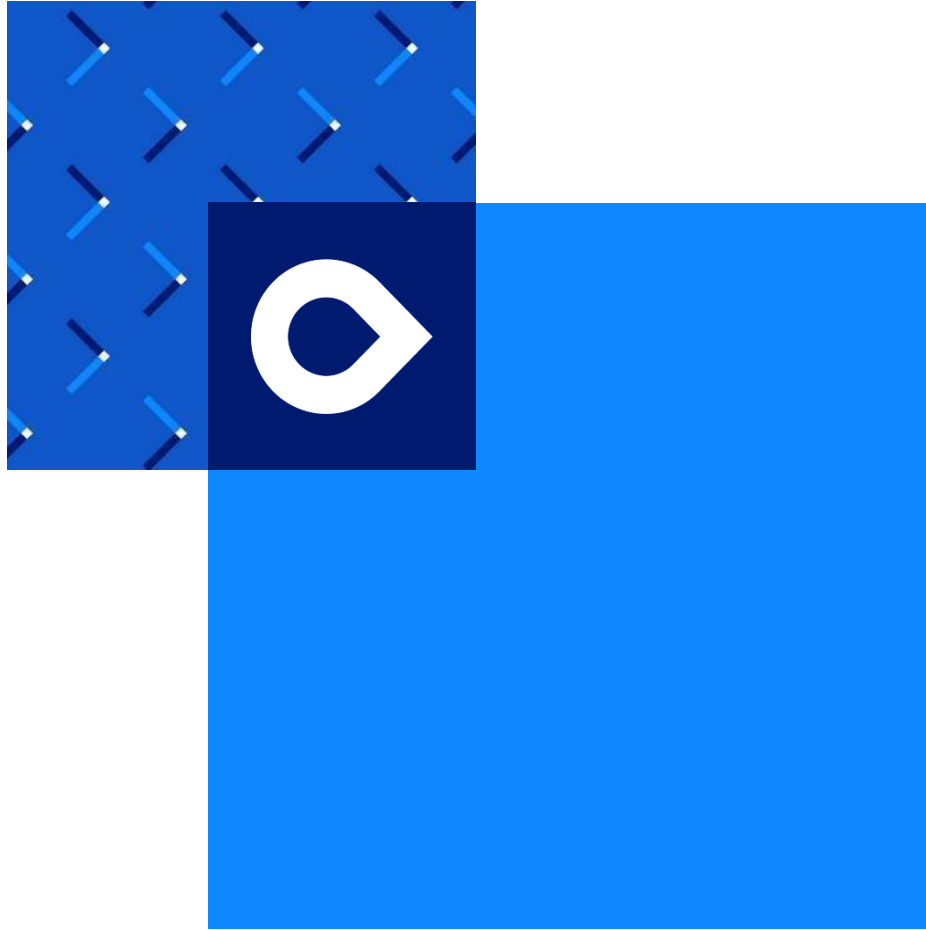
TRIGA International contracts scheme



Key Milestones from JV Creation to Current Production



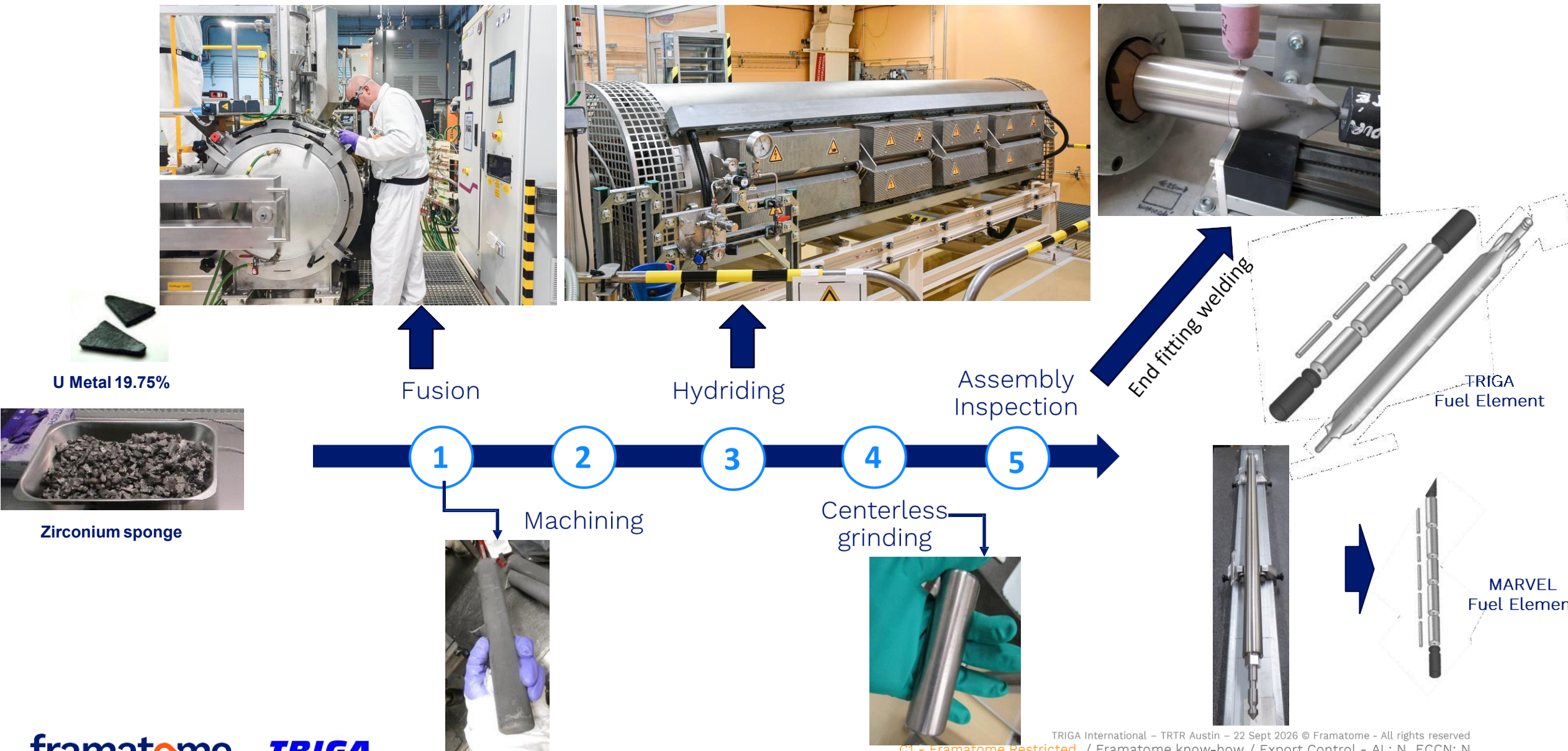
- **1995:** creation of TRIGA International and transfer of the manufacturing shop at Romans
- **1995-2012:** First operating phase focused on conversion from HEU to lower-enrichment TRIGA fuel – 1000 TRIGA fuel elements
- **2011:** manufacturing paused for renovation of the facility
- **2013:** master contract signature and start of upgrade of the TRIGA facility in Romans
- **2022:** manufacturing restarted for the University Fuel Supply program (UFS)
- **2023:** 55 FE - first delivery to Penn State University
- **2024/25:** 83 FE for UFS - 8% and 12% U content TRIGA fuel manufactured
- **2025:** 89 FE for UFS - First fuel elements with 30% U content manufactured
- **2026:** MARVEL fuel manufacturing – 37 FE of specific design
- **2026:** NRAD 46 FE manufacturing
- **2027 – 2028** expected capacity ramp up to 180 standard FE / year



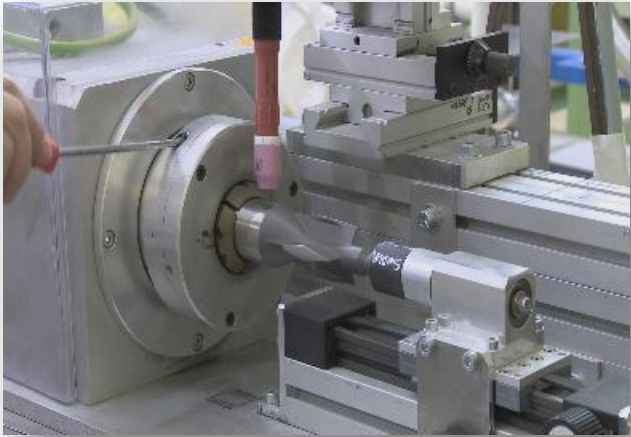
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TRIGA Manufacturing Line

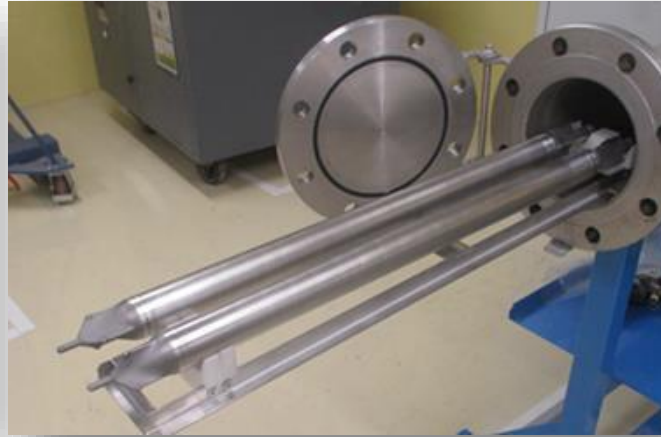
Romans Workshop TRIGA process



Fuel assembly / welding / inspection



End fitting welding



Helium leak test



Visual and dimensional inspection



Key achievements



← TRIGA
Penn State delivery

Marvel FE →



← TRIGA 83 FE inspection
University Fuel Supply
program



CONCLUSION



The historical GA TRIGA production process has been implemented in a modern facility compliant with current regulations, thanks to the GA license and a close collaboration of the JV Partners.

Each TRIGA fuel type (8%, 12%, 30%, Marvel) required a multi-month trial & industrialization period to get to the required yield and quality level

Once the fuel type validated, the production throughput can reach today 600 fuel meat (200 FE) a year

The hydration cycle is the key step in production process and determines by its length the capacity of the line

Thank you

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