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Framatome VVER-1000 Fuel Assembly Development

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PWR Prague 2026



pwr PRAGUE 2026

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1. VERA-1000 Project

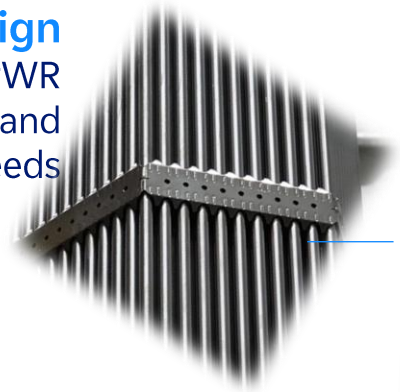
European Sovereignty by Design

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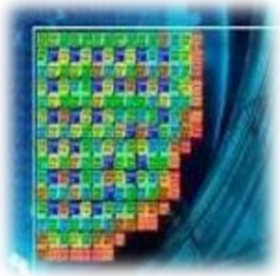
VERA-1000 Project - European Sovereignty by Design

Brand New Design

Independent development on basis of PWR experience to meet VVER requirements and prepare for future needs







Independent C&M Solution

for neutronic, thermo-hydraulic, thermo-mechanical, CHF correlation and associated tests to support FA licensing and reload justifications

Reliable European Supply Chain

Strategic use of Framatome European manufacturing capacity and supply chain





Independent Shipment Solution

Framatome container designed and licensed to ensure reliable shipment

Product targeting diversification and security of supply for VVER-1000 reactors

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2. VERA-1000 Design Features

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VERA-1000 Design Features

Direct, robot welded, inner Q12 skeleton

Mechanical robustness combined with adaptability



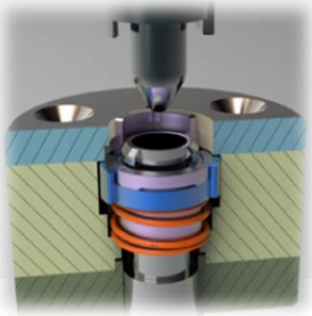
Q12 (Zircaloy) Cell type spacer- and mixing grids

Performance and neutron efficiency



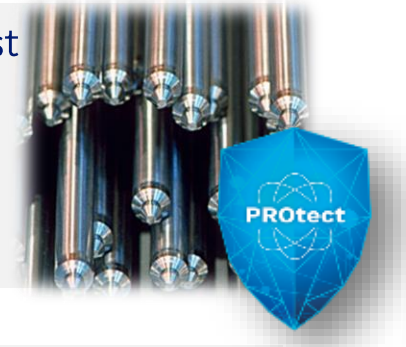
Detachable top & bottom connections

Serviceability as a standard



Latest fuel rod design features & highest UO2 capacity

Designed for future operation (18 month, ATF, Gd-solutions)



Additive manufactured debris filter and skirt

Latest technology integrated in proven architecture



Platform architecture approach

Open mixed core & adaptation possibilities





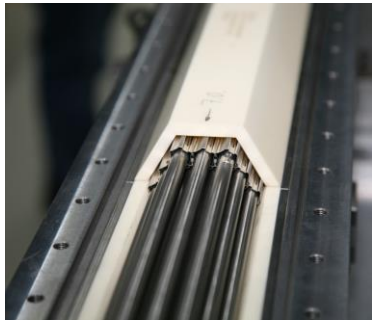
3. V&V and Testing Status

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V&V and Testing Status

1

COMPONENT TESTING



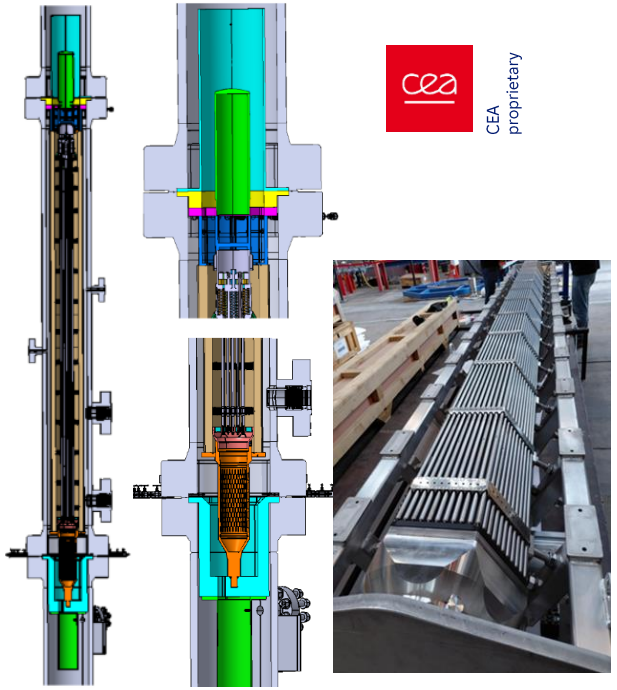




3

FULL ASSEMBLY
MECHANICAL TESTING

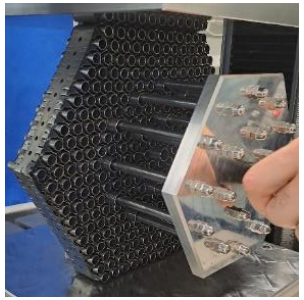
TRANSPORT LOADCASE

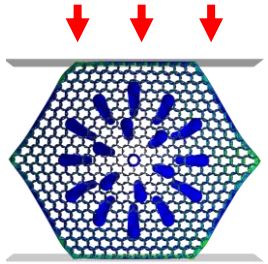




HYDRAULIC TESTING

CRITICAL HEAT
FLUX TESTING





2







FULL ASSEMBLY
FIV AND ENDURANCE

Test Fuel Assemblies Manufactured

Testing to be finished in 2027

4

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4. VERA-1000 Industrialization

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VERA-1000 Industrialization

1

COMPONENT MANUFACTURING

Steel and Zircaloy component and tube manufacturing in standard supply chain



3

SPACER AND ASSEMBLING INDUSTRIALIZATION

Automized spacer mounting and control Fuel Rod & Skeleton assembling

Integration in fabrication starting 2027







SKELETON INDUSTRIALZATION

Welding and measurement in industrialized toolchain

2



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VERA-1000 – a Modular Fuel Platform



VERA-1000 platform allows for adaptation towards use in all running VVER-1000 reactors

- Mixed-core operation as a design target in product development
- Placement of spacers and span length easily adaptable within standard manufacturing route
- Besides the 13-grid configuration as reference case in development the transition to 16 grids is part of the available product platform



VERA-1000 offers European sovereign fuel supply for all running VVER-1000 reactors

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6. Framatome VVER -1000 Container Solution

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Framatome VVER-1000 Transport Container Solution

1

CONTAINER DESIGN AND PROTYPING

Equiped with full scale dummy FA for IAEA test series

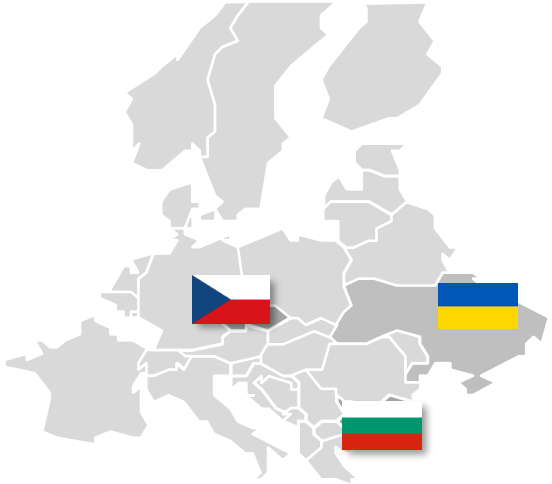




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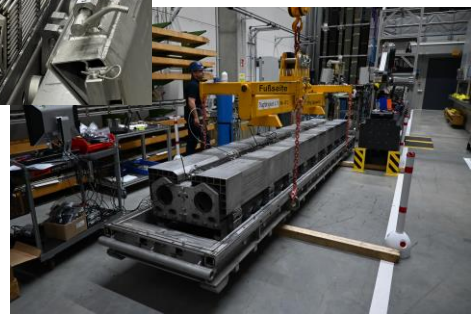
IAEA CONTAINER TEST SERIES SUCCESSFUL

Series of drop from 9m, drop on spike, fire testing performed at BAM, Berlin









REAL TRANSPORT CHECK

Test drive including shock and force measurements

2



ISSUANCE OF LICENSE AND TRANSFER LICENSES

Process for Germany well advanced

Process for transit countries to be launched

4

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Thank you

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