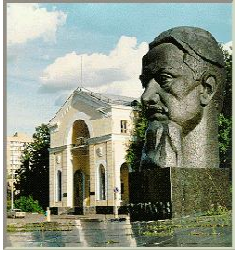
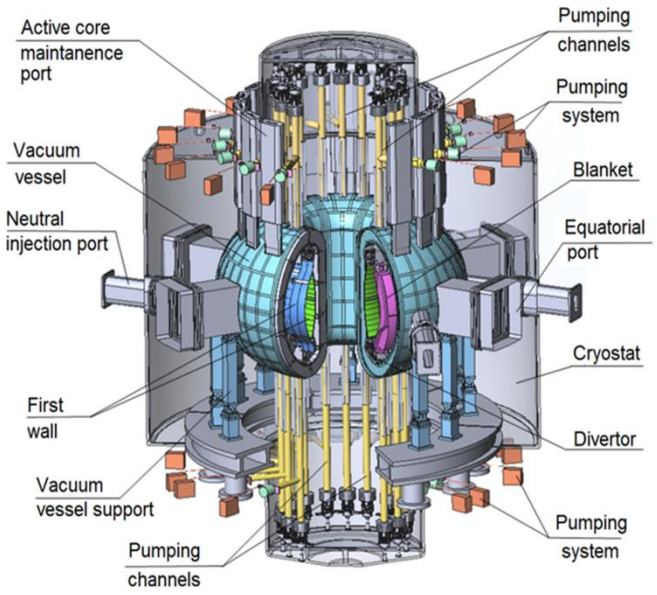


NATIONAL RESEARCH CENTER
KURCHATOV INSTITUTE

НАЦИОНАЛЬНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ ЦЕНТР
«КУРЧАТОВСКИЙ ИНСТИТУТ»

DEVELOPMENT AND INTEGRATION STUDY OF FUSION-FISSION HYBRID SYSTEMS INTO NUCLEAR POWER FUEL CYCLE

Yu.S. Shpanskiy et al. #1333



Aspect ratio R/a, m	3.2/1
Toroidal magnetic field	5 T
Electron/ion Temperature, keV	11.5/10.7
Beta normalized β_N	2.1
Plasma current I_{pl},	5 MA
Neutron yield G_N	$1.3 \cdot 10^{19}$/s
Neutral injection power	30 MW
ECR heating power	6 MW
Neutron wall loading	~ 0.2 MW/m^2
Lifetime n_0 fluence	~ 2 MWa/m^2
Consumed/ generated power	200 MW

- Enabling systems of DEMO-FNS were upgraded including Vacuum vessel, Radiation shield, Divertor, Blanket, Fuel cycle.
- Design activity was supported by R&D in neutronics, optimization of the device layout, subsystems including EMS, VV, divertor, blanket and T-fuel cycle

Composition of minor actninides from spent nuclear fuel placed in active core

Nuclide	Mass fraction, %
^{237}Np	30.0
^{241}Am	65.0
^{242m}Am	0.06
^{243}Am	4.5
^{243}Cm	0.02
^{244}Cm	0.42

- **Development of a fusion-fission hybrid facility based on superconducting tokamak DEMO-FNS continues in Russia for integrated commissioning the steady-state and nuclear fusion technologies at the power level up to 40 MW fusion and 400 MW fission reactions.**

3 to 4 Industrial FNS systems are capable of ensuring the equilibrium of the produced and transmuted Minor Acninides in the RF nuclear power system, provided that the necessary capacities for Spent Nuclear Fuel reprocessing and fuel fabrication are implemented.

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