ROSATOM Innovative Approaches and Technologies for Back-End Options

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SNF Management in Russia: Current State

- **VVER-1000 SNF (~200 t)**
- **RBMK SNF (~375 t)**
- **Other SNF (~75 t)**
  - BN, RR, VVER-400, submarines etc.

- **Centralized MCC**
  - Wet storage or dry storage
  - EDC / RT-2 reprocessing beginning 2018

- **Centralized MCC**
  - Dry storage
  - Postponed Decision

- **MAYAK RT-1**
  - Reprocessing

- **650 tons per year**
ROSATOM Search for Innovative Solutions

LWR MOX-fuel

Fast reactor MOX-fuel

REMIX-fuel

Mixed nitride (dense) fuel
Closed Nuclear Fuel Cycle Philosophy

- **U235 for 1st feed**
- **U238** natural/depleted for further cycles
- Fuel burning out
- Residual actinides burning out
- Transmutation of long living fission products
- Spent Fuel Reprocessing
  - MA (Mixed Actinides)
  - SLFP (Short Living Fission Products)
  - LLFP (Long Living Fission Products)
  - Fissionable Materials
- Fuel refabrication
- Repository for short living fission products
SNF Management: Expectations of Future

Imperatives
✓ Safety
✓ Ecological suitability
✓ Economical efficiency

Challenges
❖ Proliferation risk mitigation
❖ Significant waste reduction
❖ Raw material self-sustainability
❖ Minor actinides utilization