



POCATOM

# **Floating nuclear power plant –the experience of licensing, construction and operation**

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5<sup>th</sup> Conference of MDEP



# Key parameters of the Floating nuclear power plant (FNPP)



## FNPP

<b>Electric capacity</b>	62,9 MW
<b>Auxiliary load</b>	7,1 MW
<b>Annual generation (e)</b>	459 900 MWh
<b>Annual generation (t)</b>	219 000 Gcal
<b>Design life</b>	40 years



## Floating power unit (FPU)

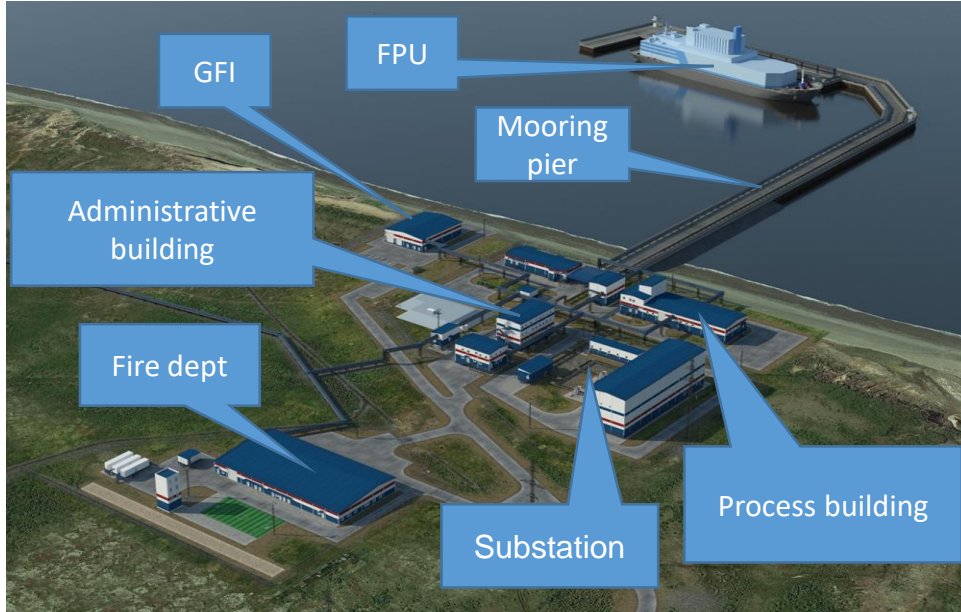
<b>RI thermal power</b>	2x150 MW
<b>Electric capacity</b>	70/77 MW
<b>Fuel campaign</b>	2,5 - 3 yrs
<b>Overhaul every</b>	10-12 yrs



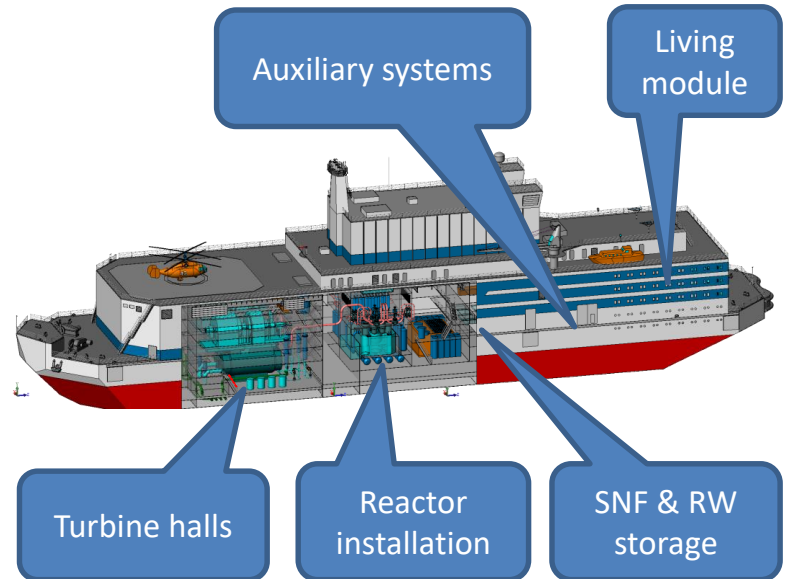
# Design



## Floating nuclear power plant

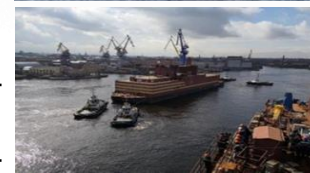


## Floating power unit



# The milestones of the FNPP commissioning

➤ <b>FPU construction finished in Saint Petersburg</b>	April 2018
➤ <b>FPU towed to Murmansk</b>	May 2018
➤ <b>FPU NEI comprehensive</b>	April 2019
➤ <b>FPU license for operation obtained</b>	June 2019
➤ <b>Mooring pier construction and commissioning</b>	August 2019
➤ <b>FPU towed to Pevek</b>	Sept. 2019
➤ <b>Onshore infrastructure completed</b>	May 2020
➤ <b>Startup operations and tests</b>	May 2020
➤ <b>The FNPP put into commercial operation</b>	22 May 2020



# FPU/FNPP construction and commissioning

Inspections and acceptance of the FPU equipment according to rules of RMRS and RTN

Towing of the FPU without propulsive system to the site

Introduced and approved a standard of FNPP decommissioning

Fresh fuel assemblies loaded in RU-1,2 in Murmansk

Remoteness of the FNPP location

Loading devices to support the comprehensive tests of the NEI of the FPU

Construction using predominantly Russian technologies and equipment

Isolated energy grid, lack of huge industrial consumers of energy and heat





# Experience of the licensing

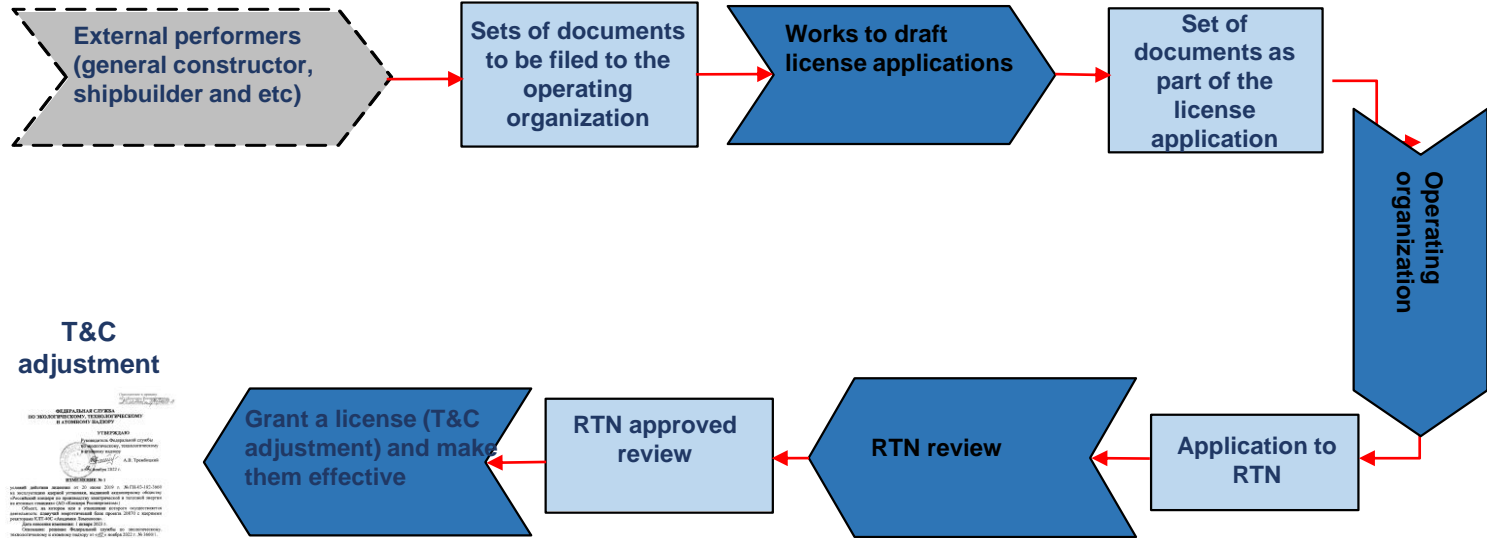
Construction  
license  
April 2005



Operation  
license  
June 2019



## Licensing process within the integrated management system



T&C  
adjustment

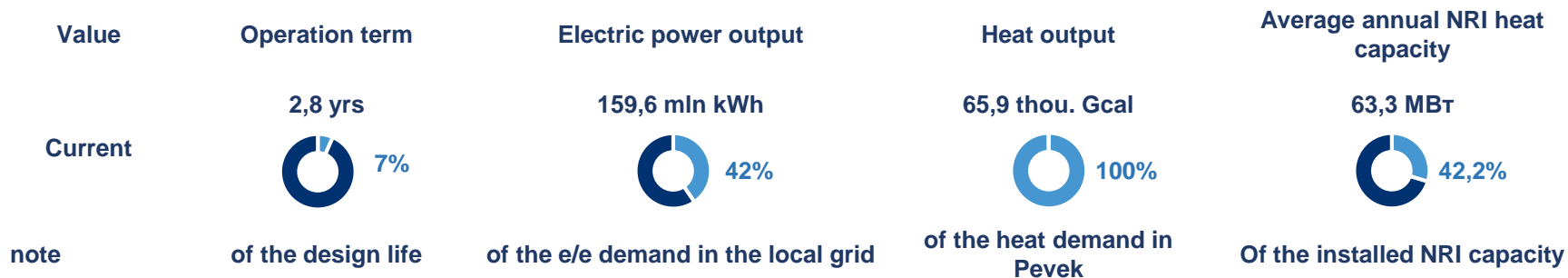


Facility under license is the FPU Akademik Lomonosov

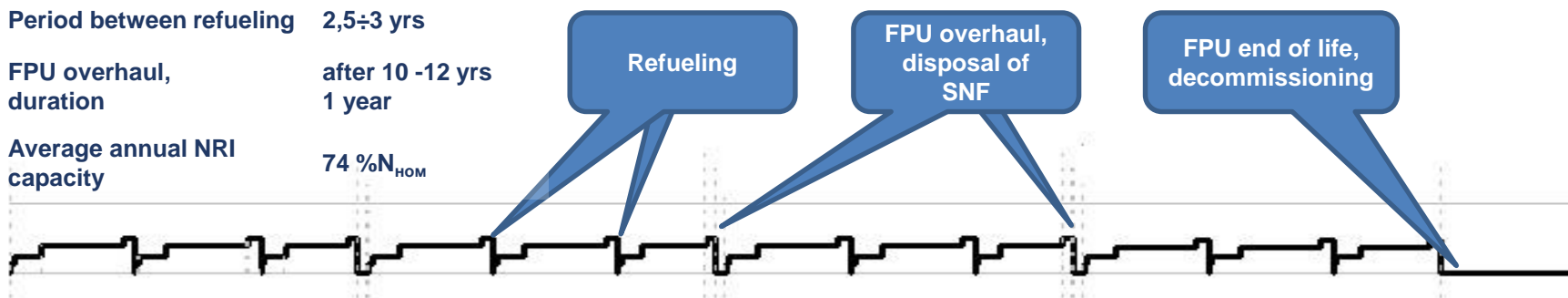
During the FPU operation phase in 2019 - 2023 rr. Rostechnadzor issued one adjustment to the Terms and Conditions

# Operation experience

## FNPP performance indicators



## Operation model for FPU reactor-1, -2



# Prospects of floating power plants

Floating nuclear power plant on the basis of modernized FPU project 20871



<b>Heat capacity of the reactor installation</b>	2x198 MW
<b>Electric capacity</b>	116 MW
<b>Auxiliary capacity</b>	10 MW
<b>Heat generation</b>	no provision
<b>Design life</b>	40 yrs
<b>Period between refueling</b>	5 yrs
<b>Load range</b>	10% - 100%

Conceptual design of optimized FPU with the NRI RITM-200M



<b>Heat capacity of the reactor installation</b>	2x190 MW
<b>Electric capacity</b>	110 Mw



# Thank you for attention

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