FEDERAL ENVIRONMENTAL, INDUSTRIAL AND NUCLEAR SUPERVISION SERVICE OF RUSSIA
(ROSTECHNADZOR)

Floating Power Unit:

Status of Construction and Licensing

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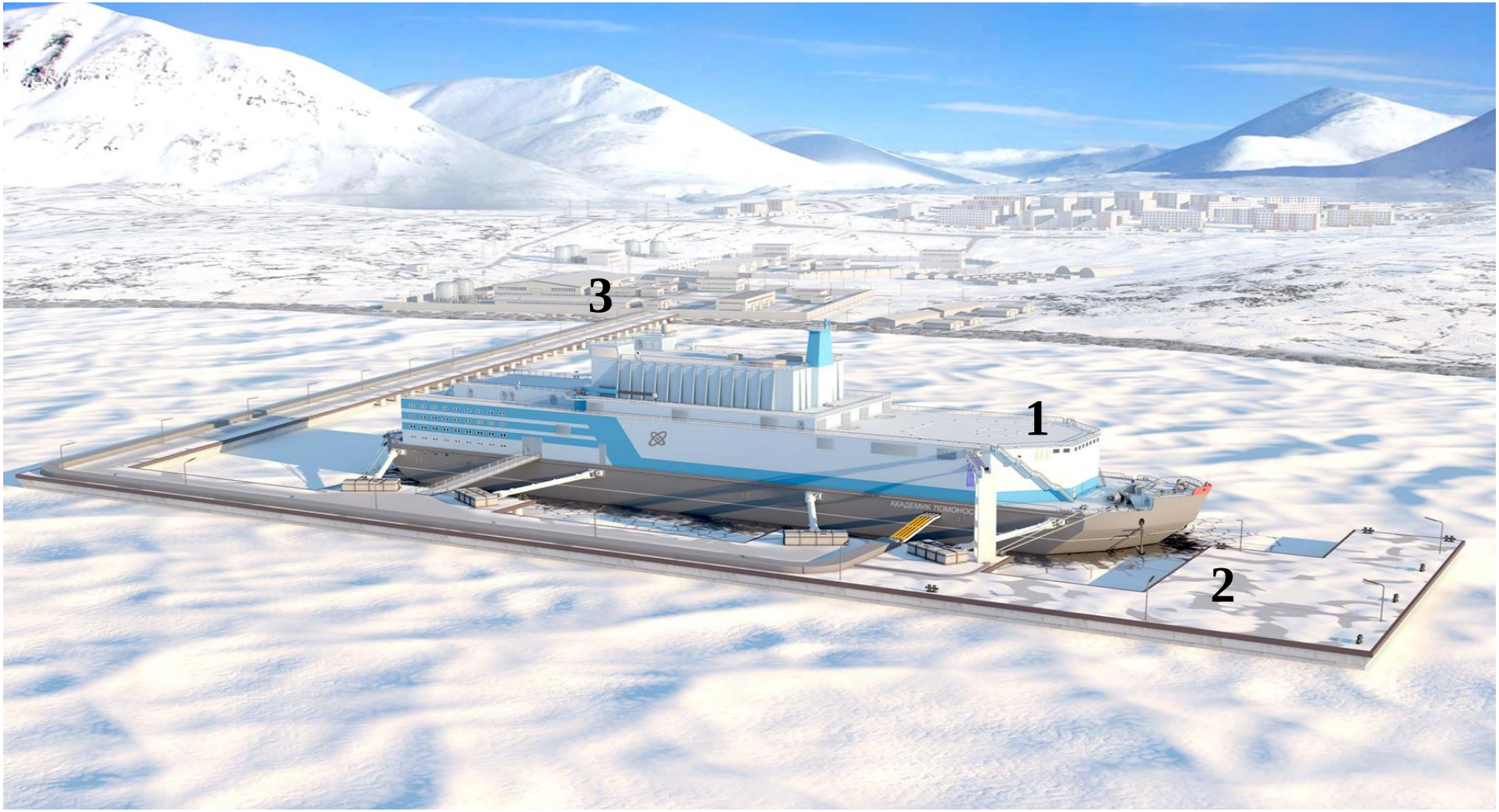
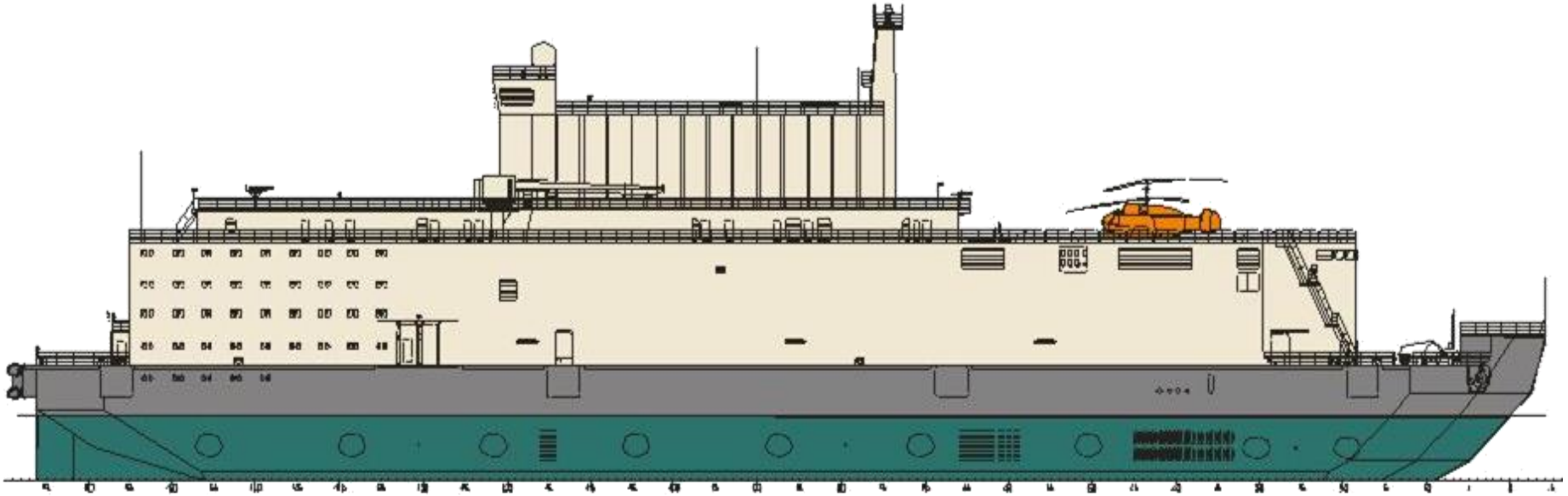
Vienna, 18-21 October 2016

Model of FNPP Power Unit Siting in Pevek, Chukotka Autonomous District



Key Parameters of Power Unit



Waterline length	**140 m**
Extreme breadth	**30 m**
Maximum water draft	**5.8 m**
Displacement tonnage	**21500 t**
Service life	**40 years**
Electrical output	**2x30 MWe**
Thermal output	**2x25 Gcal/h**

Basic Regulatory Documents

A floating power unit is a vessel or another floating facility (a self-propelled or non-self-propelled floating structure) classified by the Russian Maritime Register of Shipping, where a nuclear reactor (reactors) is used as a power generation source, and which comprises systems (specified in design documentation) for performance of its functions and safe operation.

1. International Convention for the Safety of Life at Sea of 1974 with addendum to requirements of Chapter VIII of Code of Safety for Nuclear Merchant Ships (“Code for Nuclear Ships”).
2. Code of Merchant Shipping.
3. Federal Law “On the Use of Atomic Energy”.
4. Federal Law “On Technical Regulation”.
5. Federal regulations and rules in the field of atomic energy use.
6. Regulatory documents of other federal executive bodies and organizations.

Current Status of Power Unit Construction

Academician Lomonosov Power Unit, portside view

Current Status of Power Unit Construction

Major power-generating equipment and overall vessel equipment is already on board.

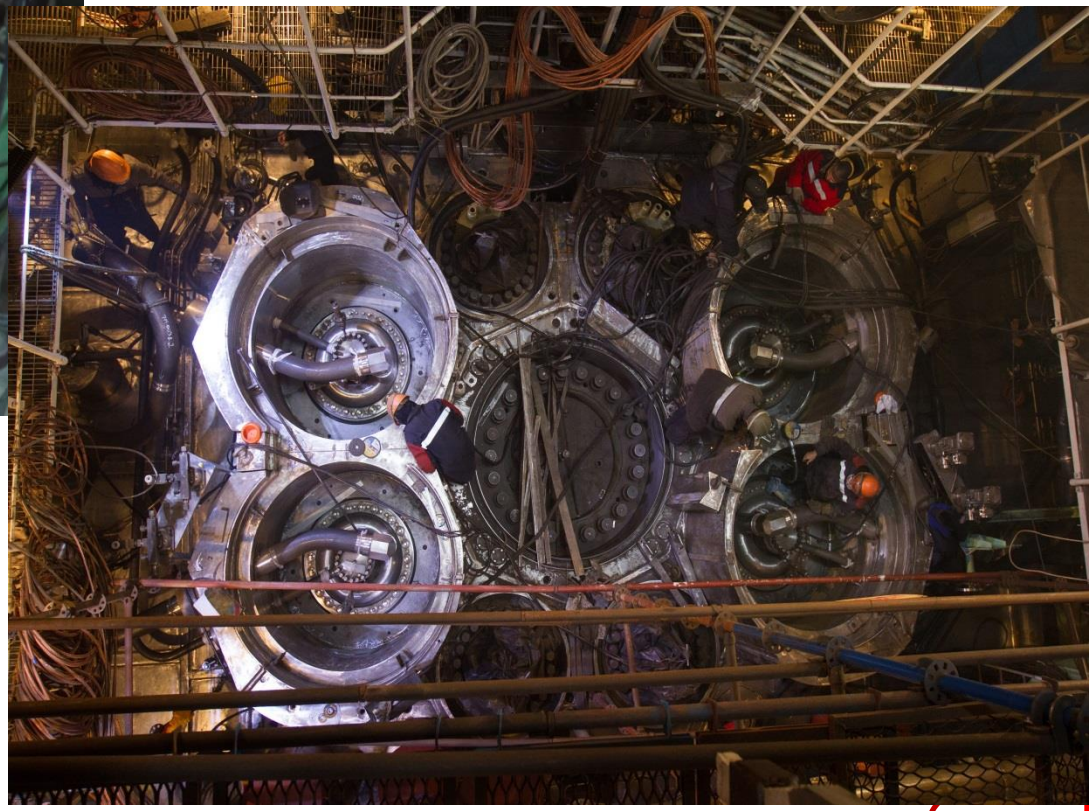
Systems and equipment in compartments (including reactor compartment) are being installed and adjusted.

Manufacturing and installation of refueling complex and preparation to nuclear fuel loading are under way.

Power Unit is ~ 90% technically ready as of 01.09.2016 .

Current Status of Reactor

Steam-generating unit in reactor compartment (reactor, steam-generators, RCP)



Steam-generating units are already on board, mounting and adjusting are under way. Nuclear fuel has been fabricated. Fuel loading and tests are expected in December 2016

Licensing of Floating Nuclear Co-generation Power Plant– Basic Regulatory Legal Acts

- **Federal Law #170 "On the Use of Atomic Energy"**
- **Governmental Decree #280 "Provision on Licensing Activities in the Field of Atomic Energy Use"**
- **Federal regulations and rules in the field of atomic energy use NP-022-200, NP-029-01, NP-054-04**
- **Rostechnadzor "Administrative Procedures for the Public Service of Licensing Activities in the Field of Atomic Energy Use" of 2014**
- **Rostechnadzor "Provision on Safety Review (Safety Case Review) Procedure for Nuclear Facilities and/or Types of Activity in the Field of Atomic Energy Use" of 2014**

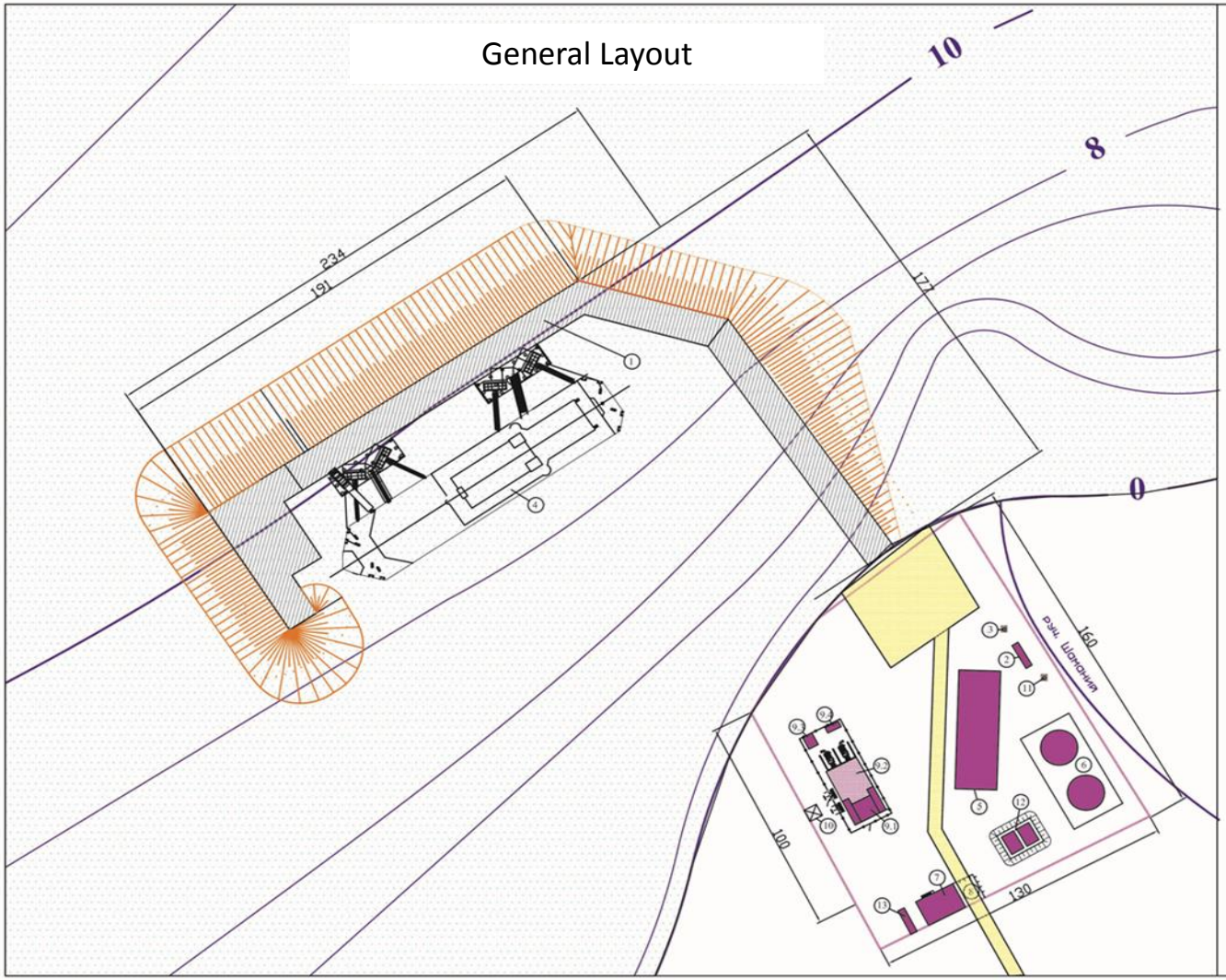
Licensing of Floating Nuclear Co-generation Power Plant– Facilities and Activities

Nuclear facilities to be licensed:Floating Power Unit assigned to category of nuclear installations

Licenses corresponding to lifecycle stages of Floating Power Unit:

- Design of nuclear installations (principal designing organization);
- Construction of nuclear installations (ship-building organization);
- Operation of nuclear installations (operating organization);
- Decommissioning of nuclear installations (operating organization);
- Design and manufacture of equipment for nuclear installations (organizations performing and providing services for designing, ship-building and operating organizations).

Hydraulic Engineering Structures and Shore Site of FNPP



ЭКСПЛИКАЦИЯ ЗДАНИЙ И СООРУЖЕНИЙ

№ по ген. плану	Наименование здания или сооружения	Количество	Этажность	Примечание
1	Мол-причал	1	-	
2	Очистные сооружения бытовых сточных вод	1	1	
3	Канализационная насосная станция №1			
	перекачки хозяйственно-бытовых стоков	1	-	
4	Плавучий энергоблок	1	-	
5	Техническое здание	1	1	
6	Баки- аккумуляторы	2	-	
7	Контрольно-пропускной пункт	1	2	
8	Площадка досмотра транспорта	1	-	
9	Распределительная подстанция в составе:			
9.1	Модуль ММПС 110 кВ	1	-	
9.2	Модуль ММПС ЗРУ10 кВ	1	-	
9.3	КТП СН 10/0,4кВ, 2х2000 кВА	1	-	
9.4	Маслосборник	1	-	
10	Мачта ЛВС 110кВ	1	-	
11	Канализационная насосная станция №2			
	перекачки общесплавныхстоков	1	-	
12	Резервуар противопожар.запаса воды емк.200м3	2	1	
13	Терминал резервной спутниковой связи	1		

Construction on shore site begins

Challenges during FNPP development and licensing

- Definition of the regulated facility status as an innovative project
- Regulatory framework for nuclear vessels was adopted, relevant federal rules & regulations were revised
- Safety of the power unit was demonstrated, report was approved, review was performed and amendments were made to construction license conditions (nuclear and radiation hazardous operations were permitted)
- Issuing of two licenses for construction and operation to the ship building and operating organizations, respectively
- Arrangement of technical supervision of power unit construction by Russian Maritime Register of Shipping
- Development of physical protection systems for both the power unit separately and in conjunction with the shore structures

Thank you for your attention!