

Engineering & Construction Division State Atomic Energy Corporation ROSATOM

# ASE Group

ASE Group



# ASE Group– Rosatom State Corporation EPC Division



**Nuclear Power Complex**



Applied and Basic  
Science



Nuclear and Radiation  
Safety



Nuclear-Powered Ice-  
breaker



Design and Construction of NPPs, Research  
Reactors, SNF and RAW Facilities



Uranium Mining



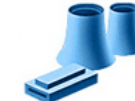
Uranium Enrichment



Fuel  
Fabrication



Equipment  
Manufacturing



Electricity  
Generation



NPP'  
Servicing and  
Upgrading

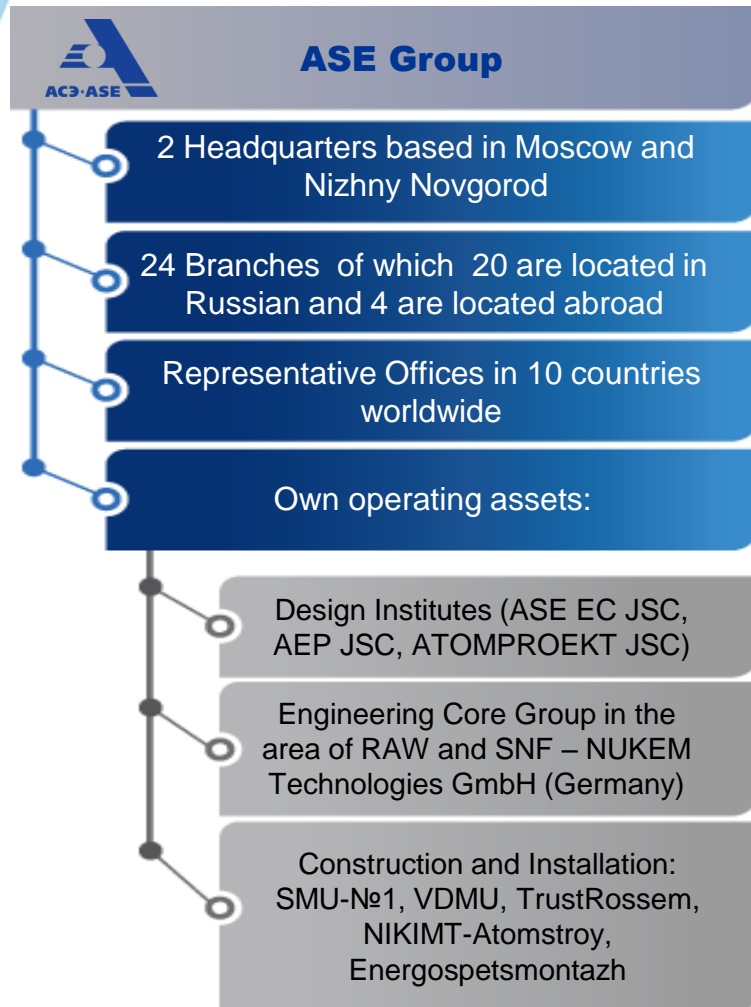
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# International Leader With More Than 80-years Experience

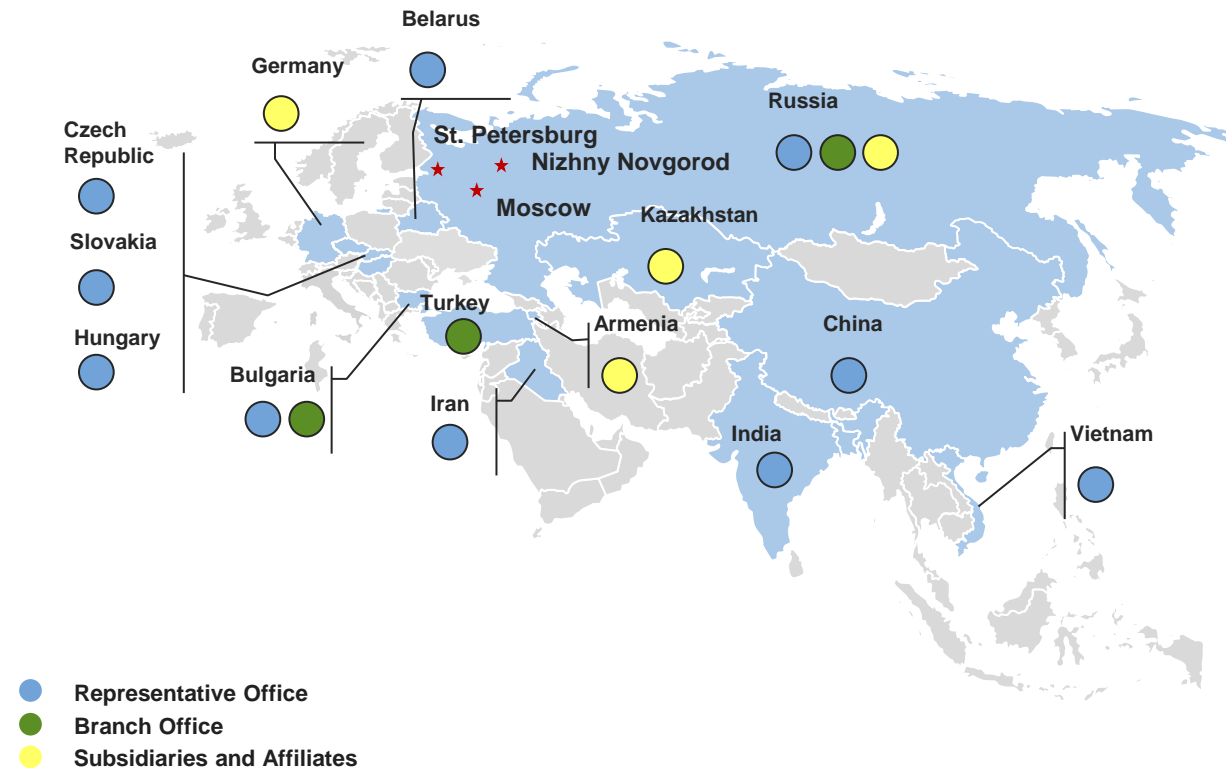


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# ASE Worldwide Presence



## Worldwide Presence



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# Key Performance Indicators



30+ NPP Units are under design and construction = about 30% of nuclear projects worldwide

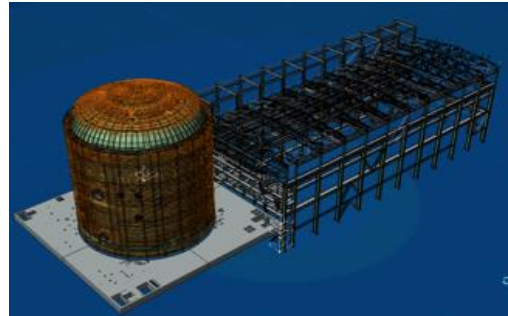
Presence in 18 countries worldwide

22 000 employees, including 5700 design engineers

\$2.9 bln –  
Revenue in 2015



ASE Group



80% of order book are projects abroad

Multi-D – innovative technology of design and construction of complex engineering facilities

8 nuclear GW commissioned over the last 10 years



# ASE Staff Dedicated to Provide Full EPC Cycle



**22 000 employees including:**



		Personnel
1	R&D	500
2	Business Development & Strategic Marketing	100
3	Project Management	1 650
4	Design	5 700
5	QA	300
6	Procurement & Logistics	1000
7	Installation work	6 500
9	Construction work	4 500
10	Others	2 000

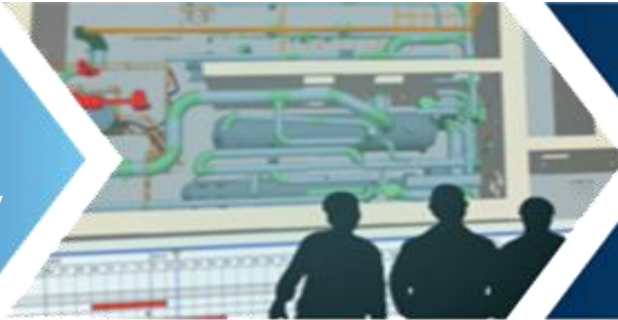
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# Permanent Improvement is the Base of Our Success



1

Multi-D training and Project Managers and Teams Training Academy



Training modules: “Procurement management”, “Sales management”, “Chain-of-Supply management”, “Construction management”, “Multi-D Field Engineering”, “Rosatom Industry system” etc.

2

Personnel training at facilities under construction for Customers and Vendors

Preparation for construction projects – training provided for engineers and workers at the facilities under construction



3

Long-term and short-term internship training for students



150 Vietnamese workers worked as trainees at the Rostov NPP in 2014

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# Deadlines, Budget and Quality Monitoring with Multi-D Innovative Project Management Technology



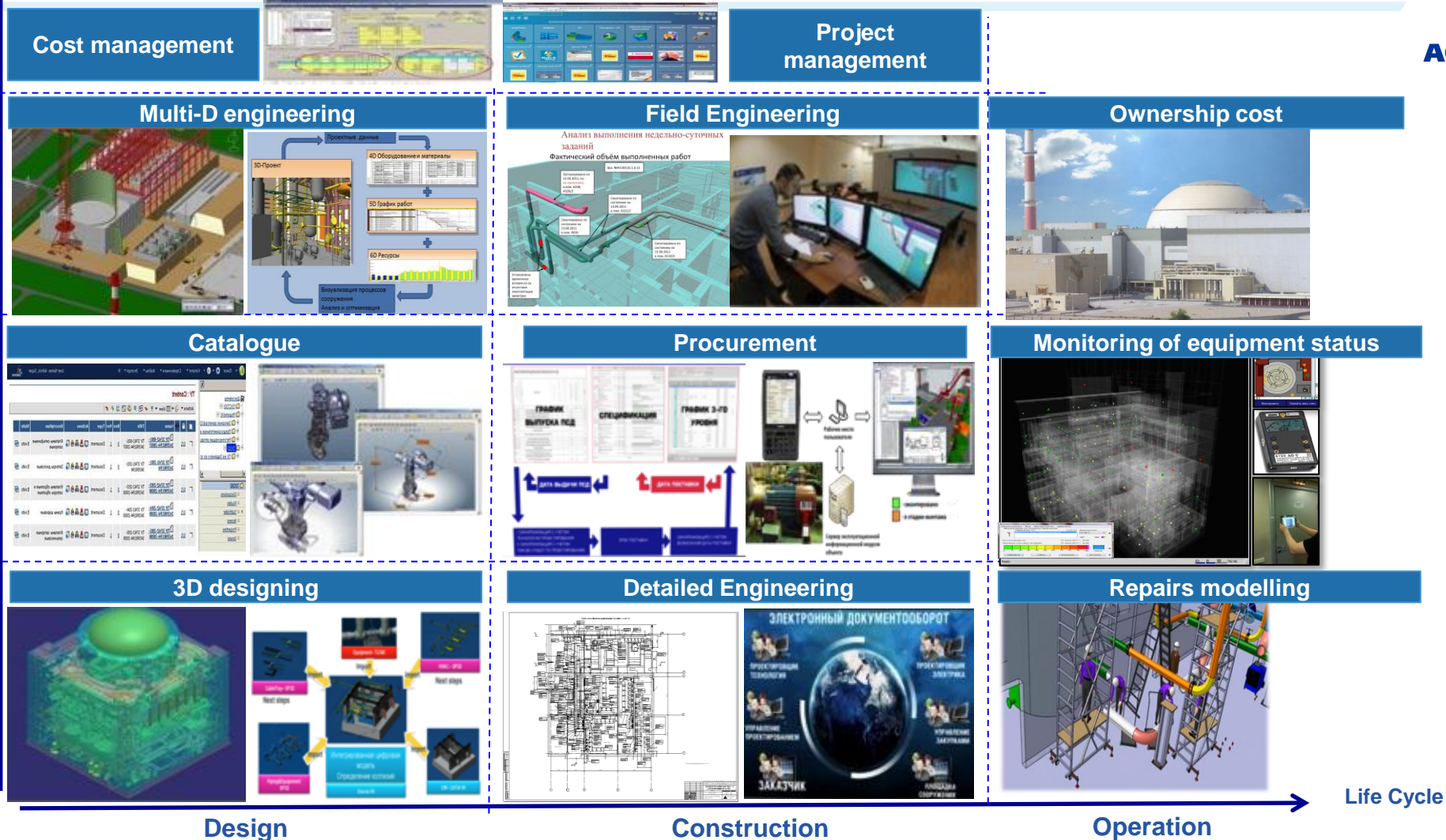
Functions

**M**  
management

**C**  
construction

**P**  
procurement

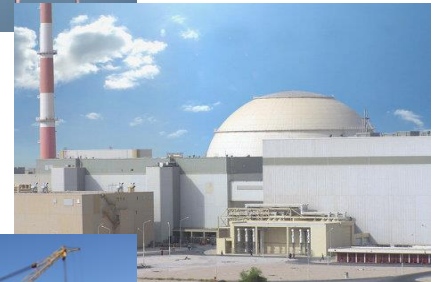
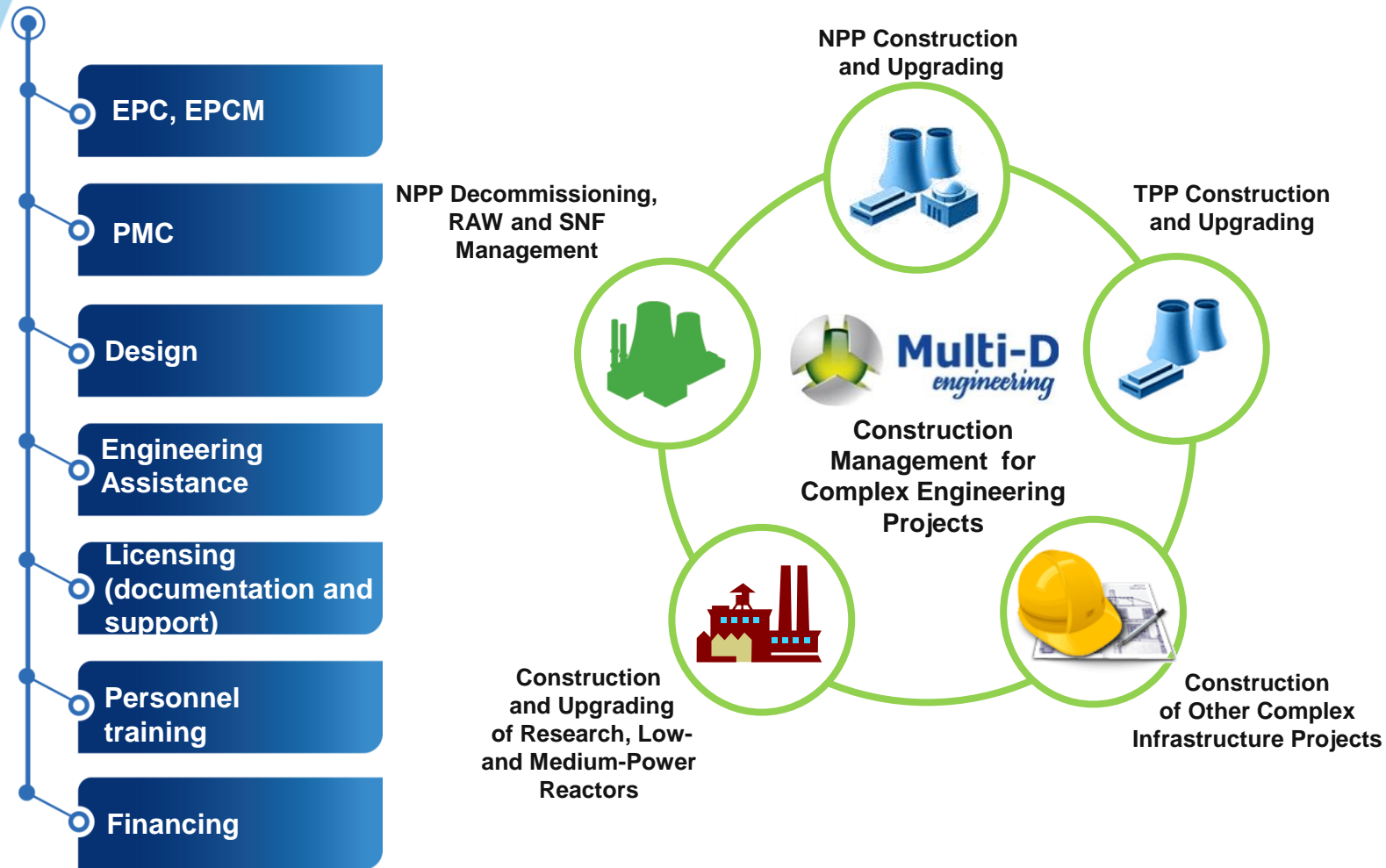
**E**  
engineering



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# Tailored Proposal for Each Project's Customer: from Individual Services up to Complex Turn-Key Contracts

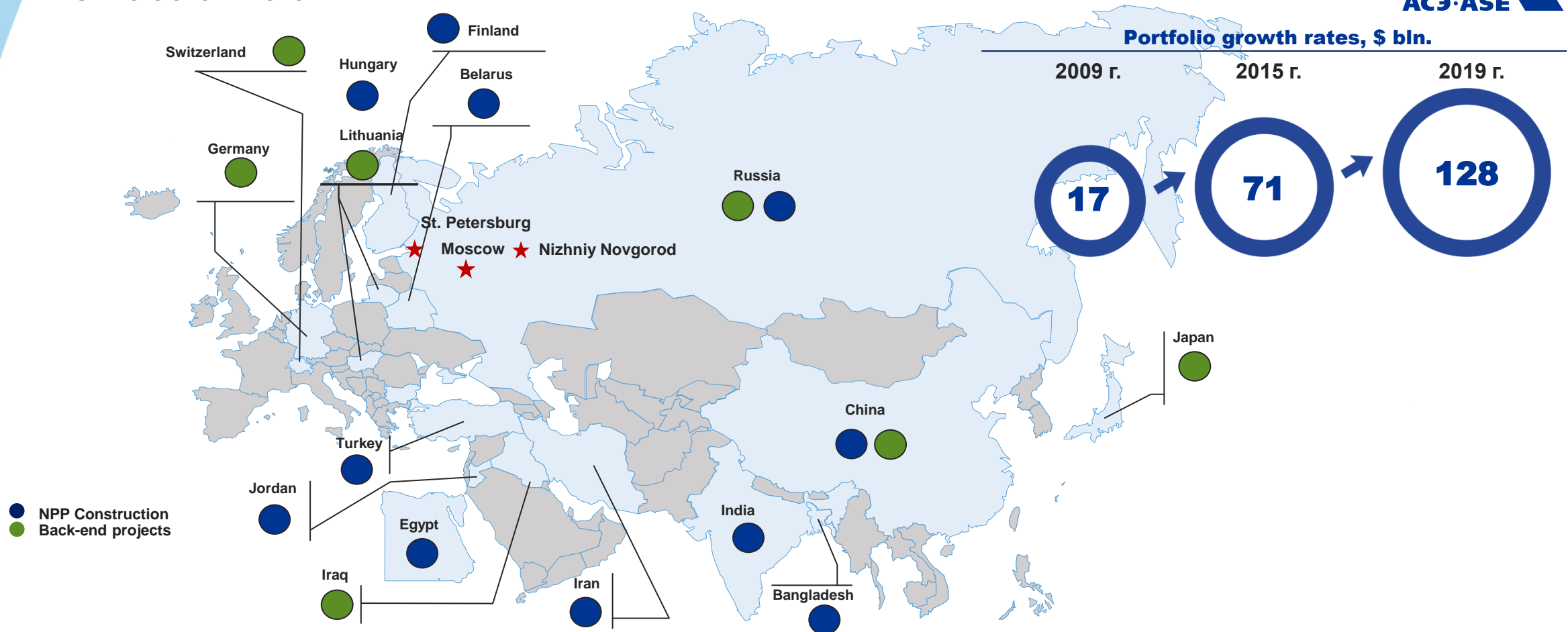


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# ASE Portfolio increased in 4 times over last 6 years and will double by 2019



## ASE Portfolio in 2016



\* Динамика портфеля указана с учетом планов по сооружению АЭС

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## Successful track record of 10 GW over 10 years

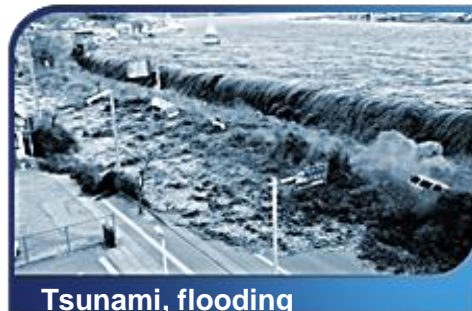
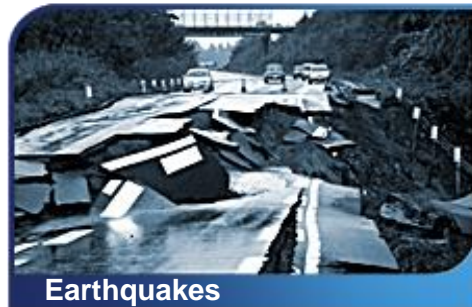


#	Project	Unit	Country	Design type	Installed Capacity, MW	Type of Works	Start-Up
1	Tianwan NP	Unit 1	China	VVER	1060	Design, Procurement, PMC	2006
		Unit 2			1060		2007
2	Rostov NPP	Unit 2	Russia	VVER	1006	EPC	2010
3	Bushehr NPP	Unit 1	Iran	VVER	1000	EPC	September 2011
4	Kalinin NPP	Unit 4	Russia	VVER	1000	EPC	November 2011
5	Kudankulam NPP	Unit 1	India	VVER	1000	Design, Procurement, PMC	2013
6	Yuzhnouralsk GRES-2	Unit 1	Russia	Combined cycle power units	400	EPC	February 2014
7		Unit 2			400		November 2014
8	Rostov NPP	Unit 3	Russia	VVER	1000	EPC	December 2014
9	Novovoronezh NPP-2	Unit 1	Russia	VVER	1200	EPC	March 2016
10	Kudankulam NPP	Unit 2	India	VVER	1000	Design, Procurement, PMC	August 2016

**10 GW over 10 years**

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# Centerpiece of our projects are VVER 1200 and VVER TOI – Gen III+ technology



**VVER**



- Complies with all Russian and International safety standards and IAEA and EUR requirements
- Containment of all radioactivity in safe conditions during the worst crashes (f.e. Fukushima NPP) for 72 hours without operator

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# Our current project: Russia, Novoronezh NPP-2 (Units 1 and 2)



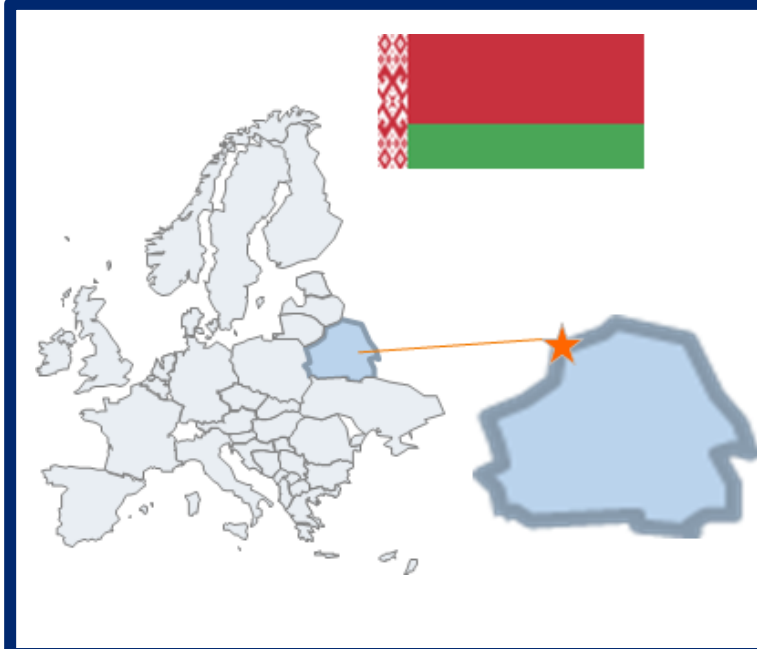
## Key Project Parameters

- **Design:** VVER.1200
- **Gross capacity:** 2\*1200 MW
- **Commissioning:** Unit 1 – March 2016,  
Unit 2 – 2018



- Passive heat removal system
- Core catcher
- 60 year design lifetime

# Our current project: Belarus, Belorussian NPP (Units 1 and 2)



## Key Parameters

- **Design:** VVER.1200
- **Gross Capacity:** 2\*1200 MW
- **Commissioning:** **Unit 1 – 2018,**  
**Unit 2 – 2020**
- First NPP project in Belarus
- High level of involvement of local Belorussian manufactures and civil construction companies
- Russian Federation credit financing

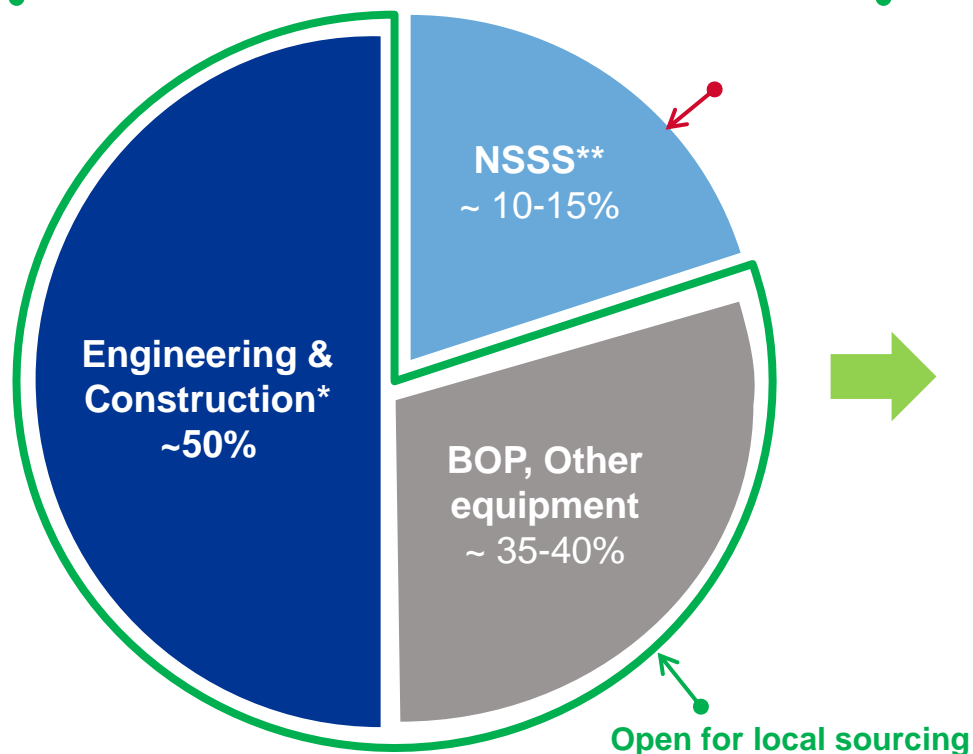


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# E-Catalogue – instrument for local sourcing



## Typical CAPEX structure of NPP construction



**Cost of equipment – roughly 50 % of overall CAPEX**

\* Incl. design, project management, commissioning, training etc..

\*\* Nuclear Steam Supply System

## E-Catalogue

— Tool to plan and manage localization and local sourcing



- Classifier of equipment and materials of local suppliers
- Suppliers and manufactures database in client country
- Design and technical documentation of NPP project
- 3D models of equipment
- Cost management
- Requirements for QM and quality control of suppliers
- Pre-qualification and certification of local suppliers and manufacturers

E-Catalogue allows to get in advance estimates of the level of local content for a client country

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# BACK-UP



# Our competences in engineering and construction for Waste&Spent Fuel Management and Decommissioning



**Nuclear Waste  
Management**



**Spent Fuel  
Management**



**Research  
Reactor  
Solutions**



**Technical support  
for New Build**

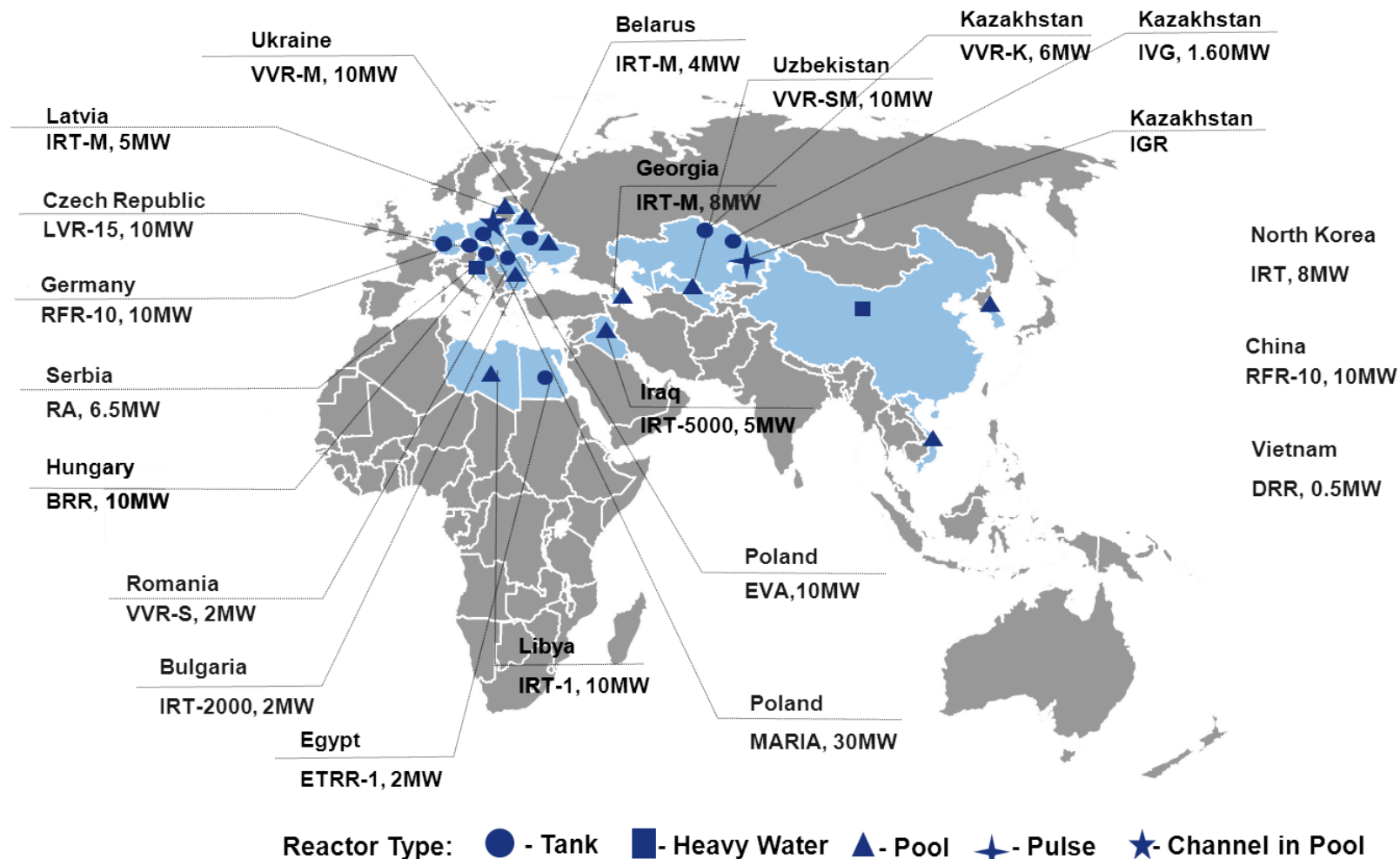


**Decommissioning**



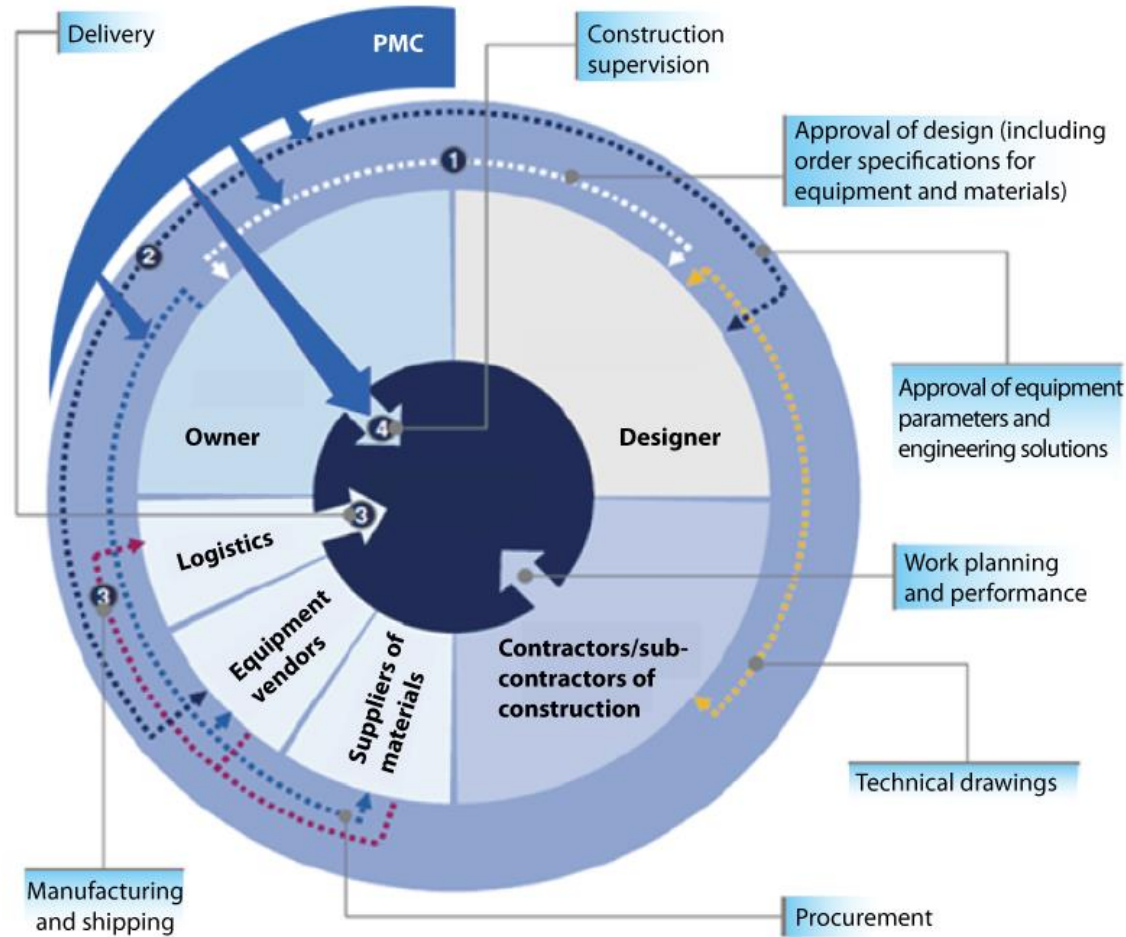
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# Russian Experience in Design and Construction of Research Reactors in Foreign Countries



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# ASE services of Project Management Consulting (PMC) ensure efficient interactions between the customer and key project participants



## ASE PMC services

- 1 Control and supervision of engineering activity on behalf of the owner (choice of technology solution, master plan, layout, selection of equipment and materials, etc.)
- 2 Manage communication between designer and manufacturer, approval of technical documentation for equipment
- 3 Assistance in efficient procurement and monitoring manufacturing and delivery
- 4 Proper monitoring of construction, erection and commissioning operations including: resource planning for construction operation; scope distribution between contractors; monitoring of construction progress; participating in planning and implementation of commissioning operations

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