AKKUYU NGS AŞ

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Human Resources Development for BOO project. Akkuyu NPP Turkey

JSC "Akkuyu Nuclear Power Plant"

Deputy CEO for HR & Administration
Andrey GURLENOV

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Akkuyu NPP is the 1st Rosatom's BOO Construction Project

Akkuyu site, Turkey

Akkuyu Project Features

- First Nuclear Power Plant in Turkey
- First Rosatom's BOO (build-own-operate) project. Under the IGA, Akkuyu NPP JSC is responsible for engineering, construction, Operation and Maintenance (O&M) of the plant.
- Legal basis: Intergovernmental Agreement, May 12, 2010
- Project design: AES-2006 (VVER-1200)
- Total capacity: 4,800 MW. (4 x 1200 MW)
- Implementation period: 2011-2023
- Total cost ~ $ 20 Bln
- Power Purchase Agreement for 15 years, fixed price terms
- Support by the Russian and Turkish Governments
- Maximization of Turkish personnel involvement in construction and operation of the plant.
- Job creation potential – up to 10 000 for the construction period

  Up to 4 000 for O&M period

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Main challenges of BOO project

- Single responsibility of one entity for execution of all phases of the project (development, financing, licensing, construction, O&M)
- Formation of positive public acceptance is of paramount importance for developer and initially his sole responsibility
- Unavailable or limited HR infrastructure in the nuclear sector of the country
- Development of nuclear energy sector is very important from national government stand point but BOO project is driven by strictly business approach

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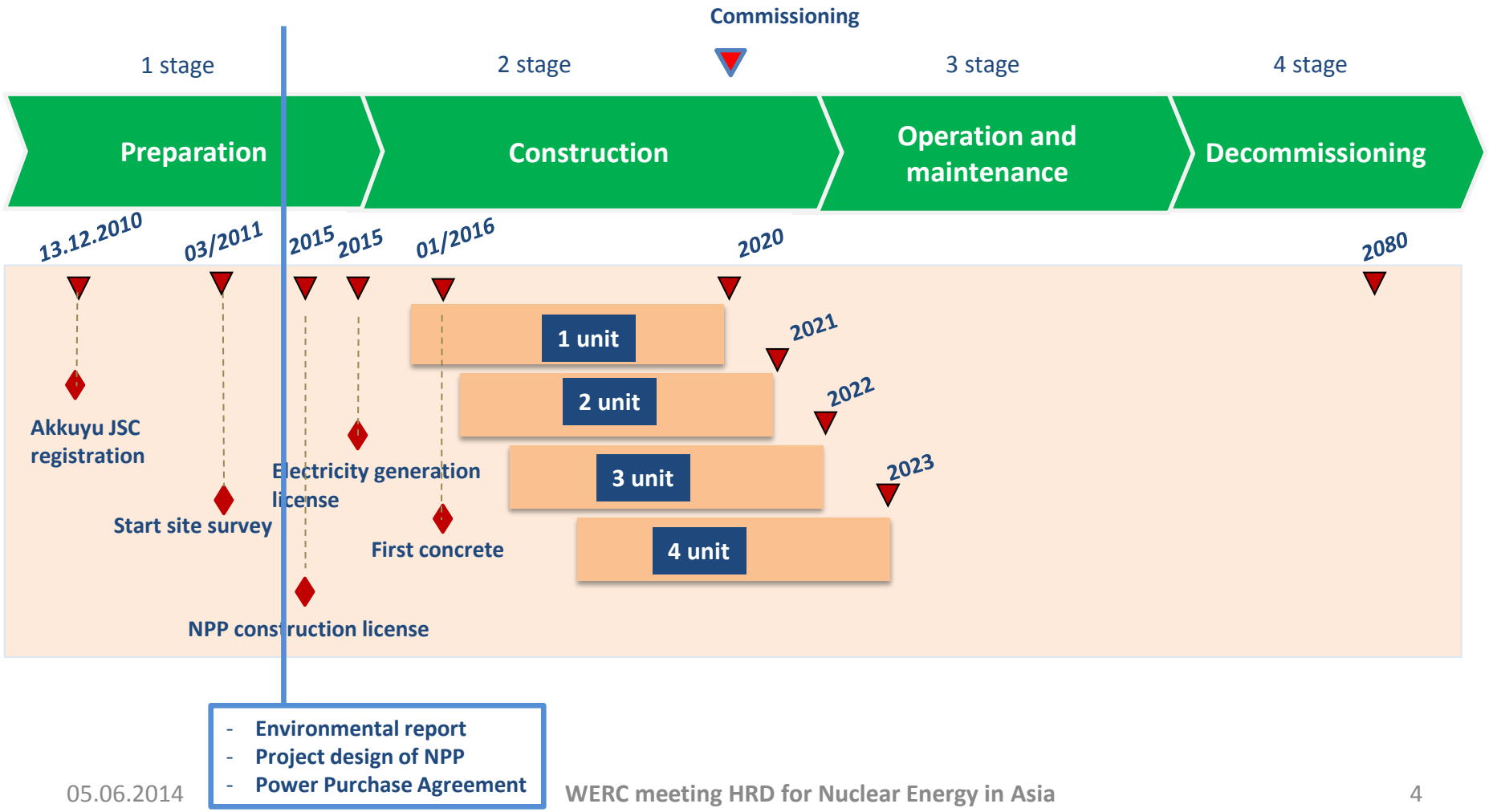
Akkuyu NPP Project



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Project organization structure

Rosatom State Corporation
Project sponsor
General responsibility for Project implementation

Rusatom Overseas
Investor/ developer

Board of Directors (shareholders)
PC management

Akkuyu NPP JSC

Owner of the NPP and electricity produced

Tailor-made JSC incorporated in Turkey. Carries functions of NPP owner, license holder, operator and GR coordinator in Turkey

Owner's Engineer*
- Technical expertise
- Cost control
- Schedule control
- Quality control

OJSC «INTERRAO Worley Parsons»
Licensing consultant

Atomstroyexport – NIAEP
Prime contractor
- Engineering surveys, detailed design documentation
- Construction and assembly works
- Equipment and materials supply

Atomenergoproject	Gidropress Design Bureau	Kurchatov institute	VNIIAES	Alstom-Atomenergomash	VNIPIET
Principal Designer	*Nuclear Island principal designer*	*Scientific advisor*	*System integrator Automatic process control system principal designer*	*Turbine-generator designer, including turbine building auxiliary equipment*	*Designer of construction and assembly technologies*

* Tender will be held in 2014

HRD Strategy basis for BOO project

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Localization of staff business case

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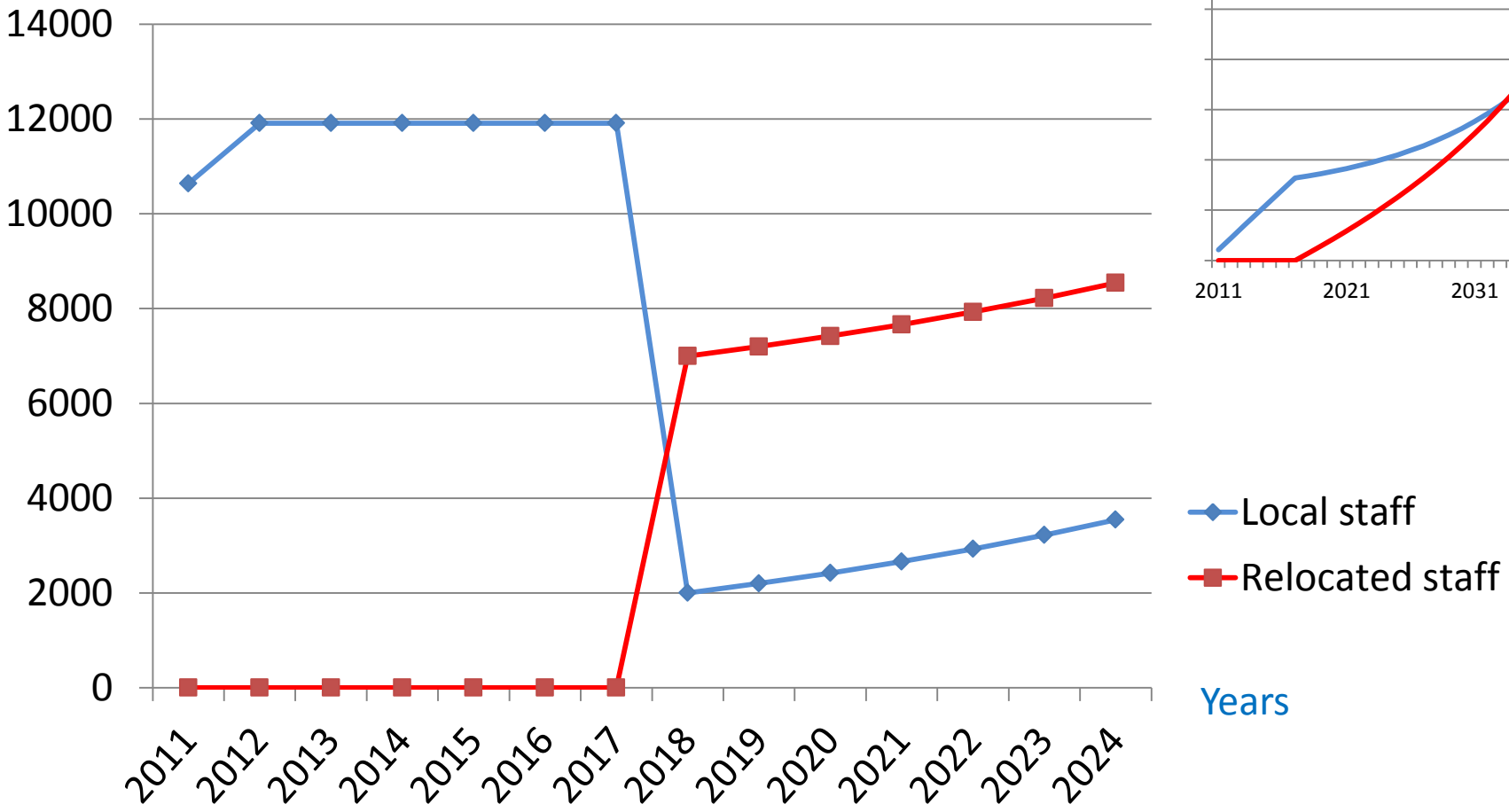
Estimated cost per employee, USD



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Staff preparation (training)

		23	22	21	20	19	18	17	16	15	14	13	Commissioning of 1st unit	11	10	9	8	7	6	5	4	3	2	1	Commissioning of 2d unit
		Months to start of commissioning												Months to start of commissioning											
Department / Position	**FTEs**	**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**		**11**	**10**	**9**	**8**	**7**	**6**	**5**	**4**	**3**	**2**	**1**	
Technical control department	**21**																								
Head of NPP shift	7																								
Head of NPP 1st unit shift	7																								
Head of NPP 2d unit shift	7																								
Reactor department	**82**																								
Head of 1st unit shift	7																								
Head of 2d unit shift	7																								
Reactor control senior engineer 1st NPP unit	7																								
Reactor control senior engineer 2d NPP unit	7																								
Thermo-mechanical O&M engineer	7																								

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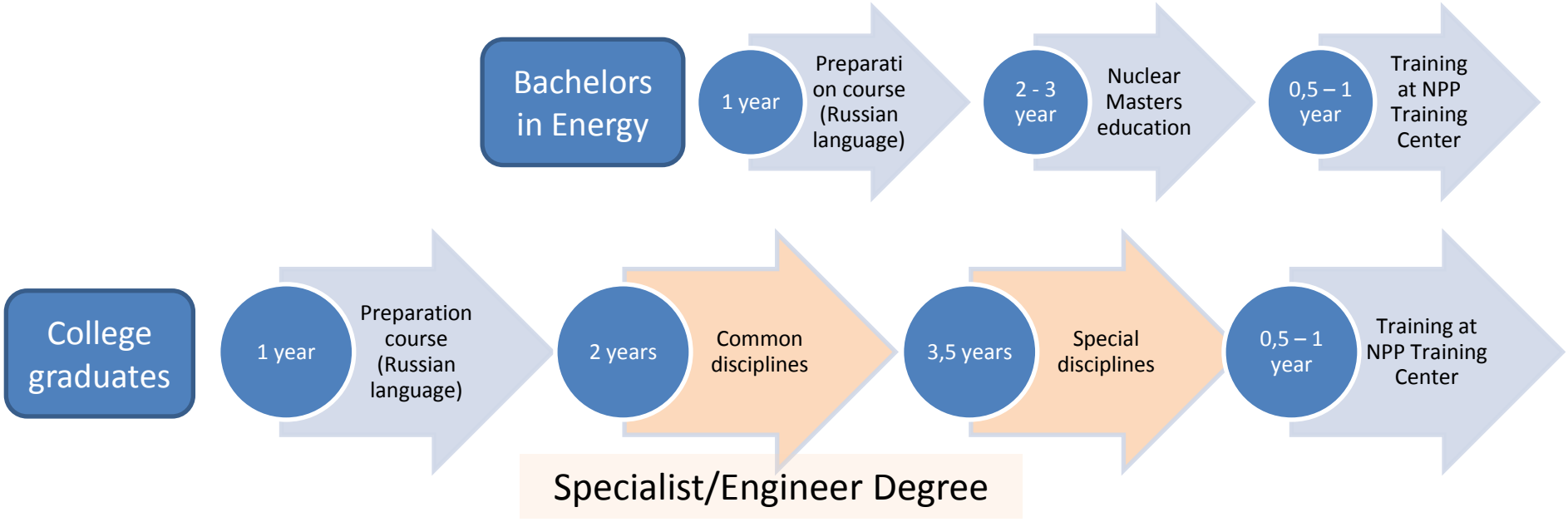
Staff preparation (education)

- There are different options of staff sourcing for new NPP project:
  - To hire power engineers and train them in Nuclear Energy field (i.e. special training centers)
  - To provide full University degree education for future employees

We will use both options, but the main issue is working language - **RUSSIAN**

Another option is to provide Master's degree education for Turkish bachelors



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Anticipated preparation program of Turkish operation staff

Main specialties used for staff preparation:

#	Name of area of degree
1	Nuclear Power Plants
2	Nuclear reactors and power plants
3	Radiation safety for people and environment
4	Thermal power plants
5	Water and fuel preparation technologies for NPP's
6	Technical operation & maintenance of electro and electro-mechanical equipment
7	Automated control systems
8	Electrical engineering, electrical mechanics, electrical technologies
9	Automated systems of information processing and control

Number of students	years						
	2011	2012	2013	2014	2015	2016	2017
Plan	50	125	225	325	425	525	600
Fact	48	112	190				

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Future plans

- Elaboration of hiring plans for O&M phase

- Finalization of education programs and schedules (when, how many and what level of graduates do we need)

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Thank you for your attention