



ROSATOM

JOINT STOCK COMPANY «ATOMIC ENERGY POWER CORPORATION»

ROSATOM CENTRAL INSTITUTE  
FOR CONTINUING EDUCATION AND TRAINING  
(ROSATOM-CICE&T)



# ROSATOM CENTRAL INSTITUTE FOR CONTINUING EDUCATION&TRAINING

## ACTVITIES IN SUPPORT NEWCOMER COUNTRIES

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1. Introduction in ROSATOM-CICE&T Activities
2. Training Solutions in Cooperation with the IAEA
3. Conclusions

# 1. Introduction in ROSATOM-CICE&T Activities

# Obninsk- cradle of the NPP development



**Central Institute  
for Continuing Education&Training  
Since 1967  
(SAEC “ROSATOM”)**

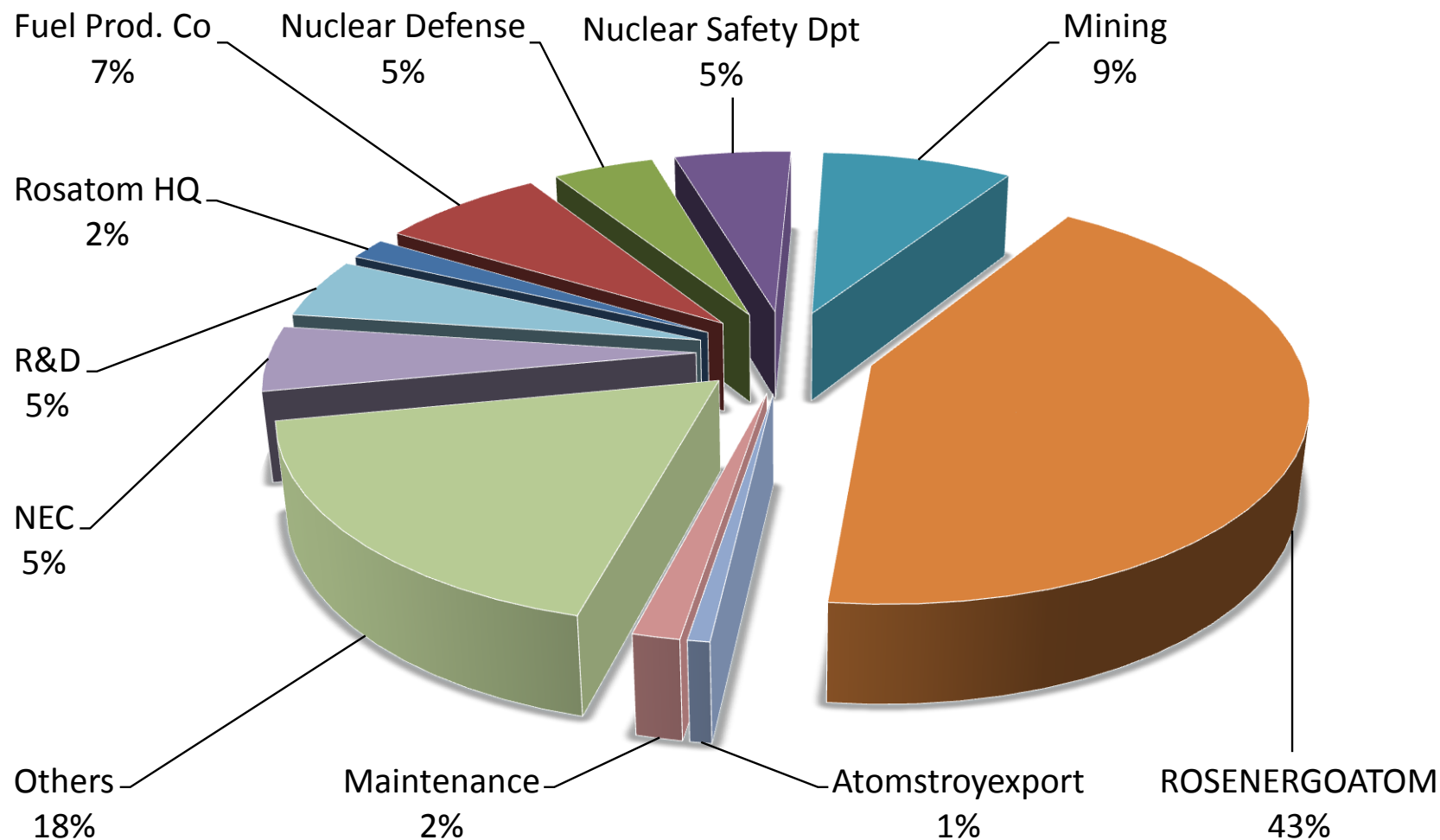


**2009- branch of National Research Nuclear University MEPhI  
1985- Obninsk Institute for Nuclear Power Engineering  
1953- branch of Moscow Engineering&Physics Institute  
(Ministry of Education&Science)**



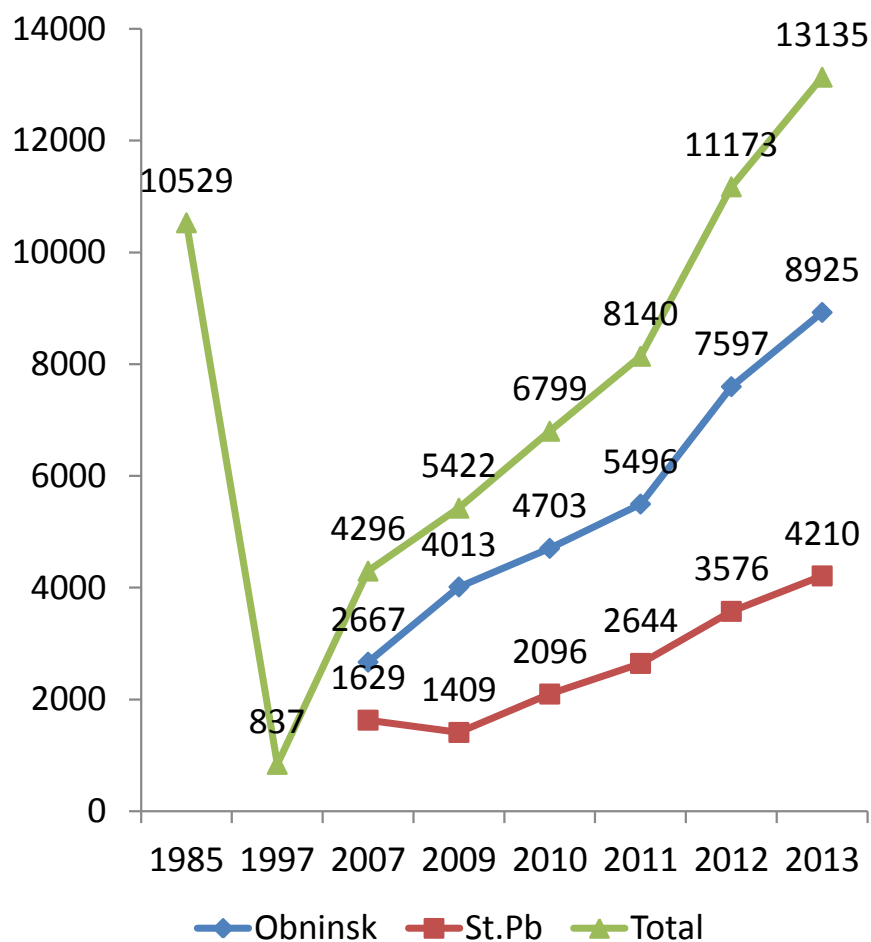
**The-First-in-the-World Nuclear Power Plant  
27 June, 1954**

# Distribution of training services by ROSATOM divisions

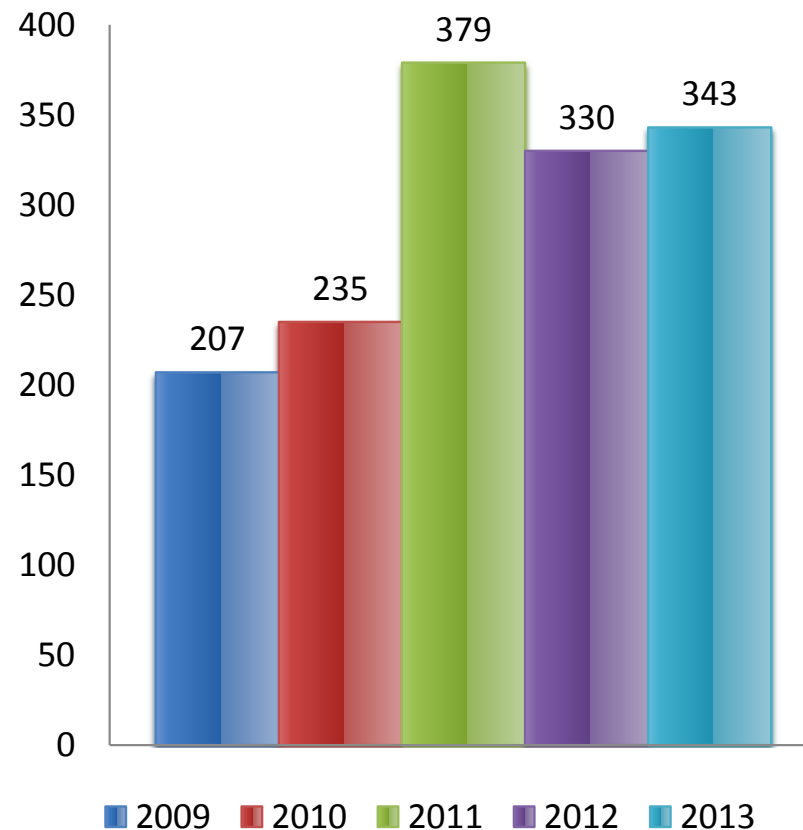


# ROSATOM CICE&T Training Dynamics

## Number of trainees (persons/yr)



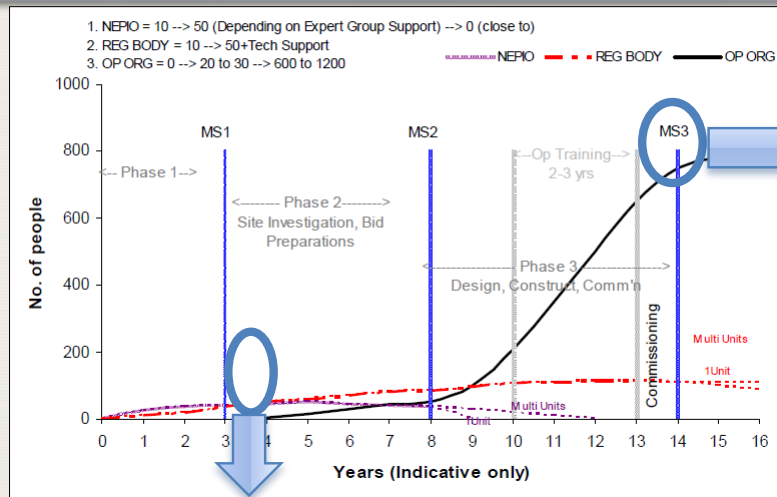
## ROSATOM CICE&T Staff



## 2. Training Solutions for Newcomer Countries

# Essentials of HRD in Emerging Nuclear Countries

## Phasing the Training Programme

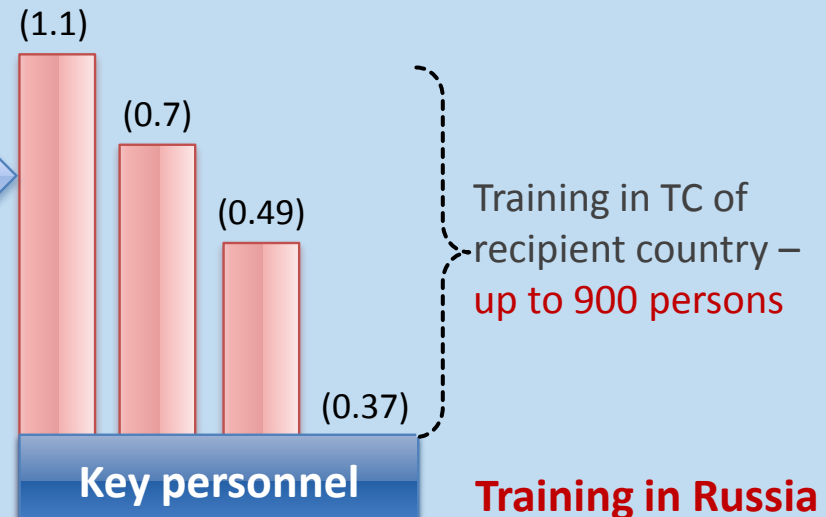


### Personnel for Nuclear Programme

- Nuclear Energy Program Implementing Organization (NEPIO) – **50 persons**
- Regulatory body (RB) – **70 persons**
- Operating organization (OO) – **150 persons**

**Total: 270 persons/country – training in Russia**

## NPP Staffing options (person/MW)



(operating personnel, mid-level and top managers):

**up to 200 persons per 1 unit**  
**up to 300 persons per 2 unit**



# Signing Practical Arrangements Between ROSATOM Subsidiaries and the IAEA

19.09.2011



Left to right

V.G. Asmolov, First Deputy of General Director of Rosenergoatom;

A.V. Bychkov, Deputy Director General of the IAEA,

Yu.N. Seleznev, Rector of CICE&T

## ■ Objectives:

- □ Rosenergoatom, CICE&T and IAEA reached understanding that enhancing interaction between them requires cooperation in the following areas:
  - □ Exchange and dissemination of information, including release of joint publications;
  - □ Mutual support in establishing **training courses to develop human resources** for countries embarking on the way of developing nuclear power;
- Organizing joint missions to evaluate requests from recipient-countries

# Forming the Pool of Russian Experts to Support National Nuclear Infrastructure Development in Newcomer Countries

1/2

## Milestones

Milestone 1: Understanding the commitment (pre-project)

Milestone 2: Ready to request bid for the first NPP

Milestone 3: Ready to commission and operate the first NPP

## Elements of Nuclear Infrastructure

National Position

Regulatory Framework

Financing

Safeguards

Emergency Planning

Nuclear Waste

Nuclear Safety

Stakeholder Involvement

Management

Legal Framework

Radiation Protection

**Human Resource**

Security

Nuclear Fuel Cycle

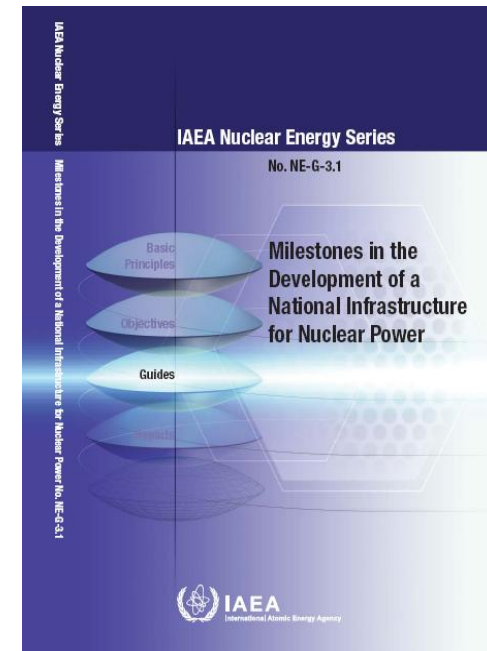
Environmental Protection

Sites selection

Electrical Grid

Industrial Involvement

Procurement



# Selection team of Russian Experts to Support National Nuclear Infrastructure Development in Newcomer Countries

2/2

## Goal:

**To build up a group** of Russian Experts for providing assistance to embarking countries.

**To learn the essentials** of the IAEA approach and recommendations and National nuclear power plans

**To work out the guidelines** for each infrastructure element

**To establish interaction** and understanding between Russian and their international counterparts on NI issues



## Outcome:

**Road map** for each element of NI: structure, functions, forms

**Training courses, E&T Services**, Internship, On-job-training

**Assistance** in development of regulations, "strategies & plans", etc.

**Specific solutions: "Centers"** based on Russian experience .



# Rosatom Central Institute for Continuing Education&Training – Platform to Support Nuclear Infrastructure Development

## ROSATOM Central Institute for Continuing Education & Training

**CICET**

Since 1967

(SAEC “ROSATOM”)







- is the leading ROSATOM institution responsible for support of nuclear infrastructure development in embarking states
- complies with the IAEA mile-stone approach as methodology
- signed corresponding practical arrangement with the IAEA



# Training Courses available in Rosatom CICET








(optimum number of trainees: 6-10 participants)

1/3

No	Course Title	Language	Duration	Training materials
1	Preparation of the bid invitation for the first NPP		100 h	TP, HB, PPTs, LP
2	Site selection and qualification		100 h	TP, HB, PPTs, LP
3	Characteristics and design of nuclear fuel, including safety margins		100 h	TP, HB, PPTs, LP
4	Security and physical protection of NPPs and the relationship with safety and safeguards		100 h	TP, HB, PPTs, LP
5	Training Course for Top Managers of NEPIO: Start-up of nuclear power programme		100 h	TP, HB, PPTs, LP
6	Nuclear waste management		100 h	TP, HB, PPTs, LP
7	Project Management for NPP Construction		100 h	TP, HB, PPTs, LP

# Training Courses available in Rosatom CICET

2/3

No	Course Title	Language	Duration	Training materials
8	Nuclear power plants with nuclear reactors of small power in Russia		100 h	TP, HB, PPTs, LP
9	Reactor Island: Physics and Equipment of primary circuit for Engineers		100 h	TP, HB, PPTs, LP
10	Thermo Hydraulics, engineering and Equipment of secondary circuit (Turbine Island) for Engineers		72 h	TP, HB, PPTs, LP
11	Basic course on safety of nuclear technology		540 h	TP, HB, PPTs, LP
12	Nuclear fuel fabrication		72 h	TP, HB, PPTs, LP
13	Computer simulation to assess nuclear safety		156 h	TP, HB, PPTs, LP
14	Radiation Safety and Health Protection		72 h	TP, HB, PPTs, LP

# Training Courses available in Rosatom CICET

3/3

No	Course Title	Language	Duration	Training materials
15	Specifics of WWER Design: Safety Issues		144 h	TP, HB, PPTs, LP
16	Safety analysis for NPP with WWER reactors		72 h	TP, HB, PPTs, LP
17	Policy on Decommissioning and Regulatory Control		36 h	TP, HB, PPTs, LP
18	PP Safety Assessment based on Preliminary Safety Analysis Report		72 h	TP, HB, PPTs, LP
19	Financial Aspects of NPP Construction		36 h	TP, HB, PPTs, LP
20	Risks Assessment and Risk Management		36 h	TP, HB, PPTs, LP



# Implementation of training courses. Typical Arrangements

## Typical arrangements

23 Nove mber	24 November	25 November	26 November	27 Novemb er	28 Nove mber	29 November	30 November	01 December	02 December	03 December	04 December	05	06	07	08	09	10	11	12 Dece mber
												December							
Arrival	Training 10 AH*	Training 10 AH	Training 10 AH	Training 10 AH	Holid ay	Training 10 AH	Training 10 AH	Training 10 AH	Training 10 AH	Training 10 AH	Training 10 AH	Practical experience Balakovo NPP (by train)							Departure

\*AH– Academic Hour (45 min.)

Totally 100 AH



Theoretical course in  
CICET



Practical experience: FSS,  
TC of Balakovo NPP



Technical Tour: SG  
manufacturing plant





# Cooperation with the IAEA: Training Top Managers in Nuclear Power Program for Vietnam in 2011

**5-18 June 2011**



Course:  
Project Management  
for NPP under  
Construction

**20-27 August 2011**



Course:  
Reactor physics for  
engineers

**02-15 October 2011**



Course for NEPIO:  
Initialization of national  
nuclear power programmes

# Training of Bangladesh Specialist in Cooperation with the IAEA



**Establishing Nuclear Power:  
Siting, Reactor Design,  
Quality Assurance  
15-26 April 2013**

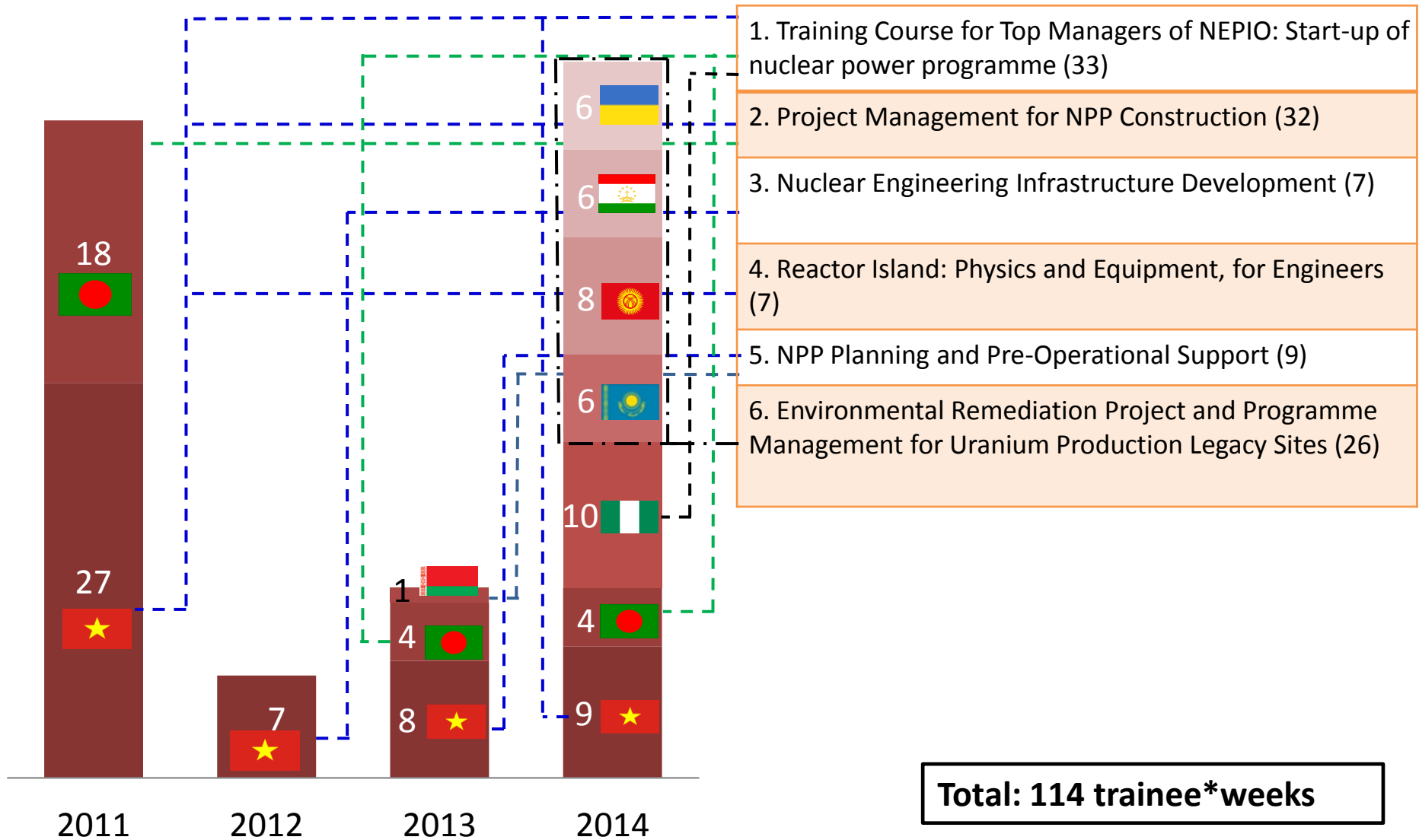


**Project Management for NPP  
Construction  
04- 17 Dec. 2011**



**Project Management for NPP  
Construction  
31 May– 07 June, 2011**

# Training of specialists for national nuclear infrastructure conducting by ROSATOM-CICE&T in cooperation with IAEA



# Bilateral Cooperation with VN Organizations in 2012

## Basic course on safety of nuclear technologies



Training dates: 17.09– 14.12. 2012.  
Training language: English.  
Trainees: VAEA (3),  
VINATOM (2),  
VARANS (5)  
Total: 10 persons

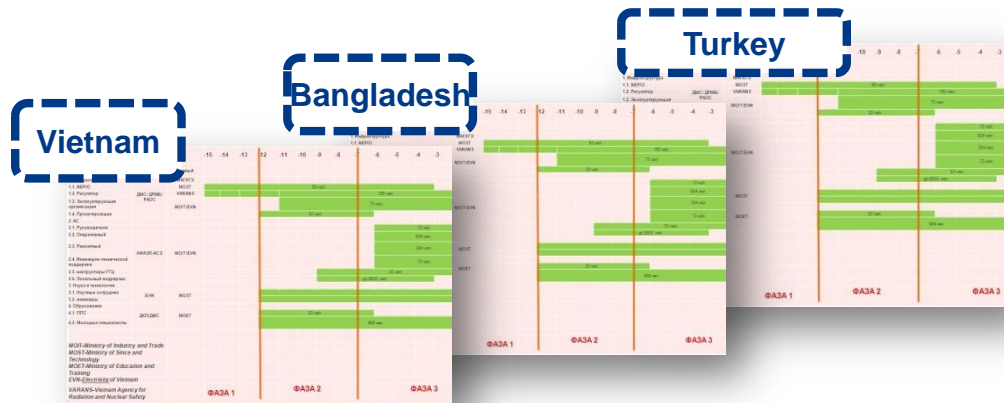
## Introductory course in simulator application for safety analysis



Training dates: 19.11– 14.12. 2012.  
Training language: English.  
Trainees: VARANS (6),  
Total: 6 persons

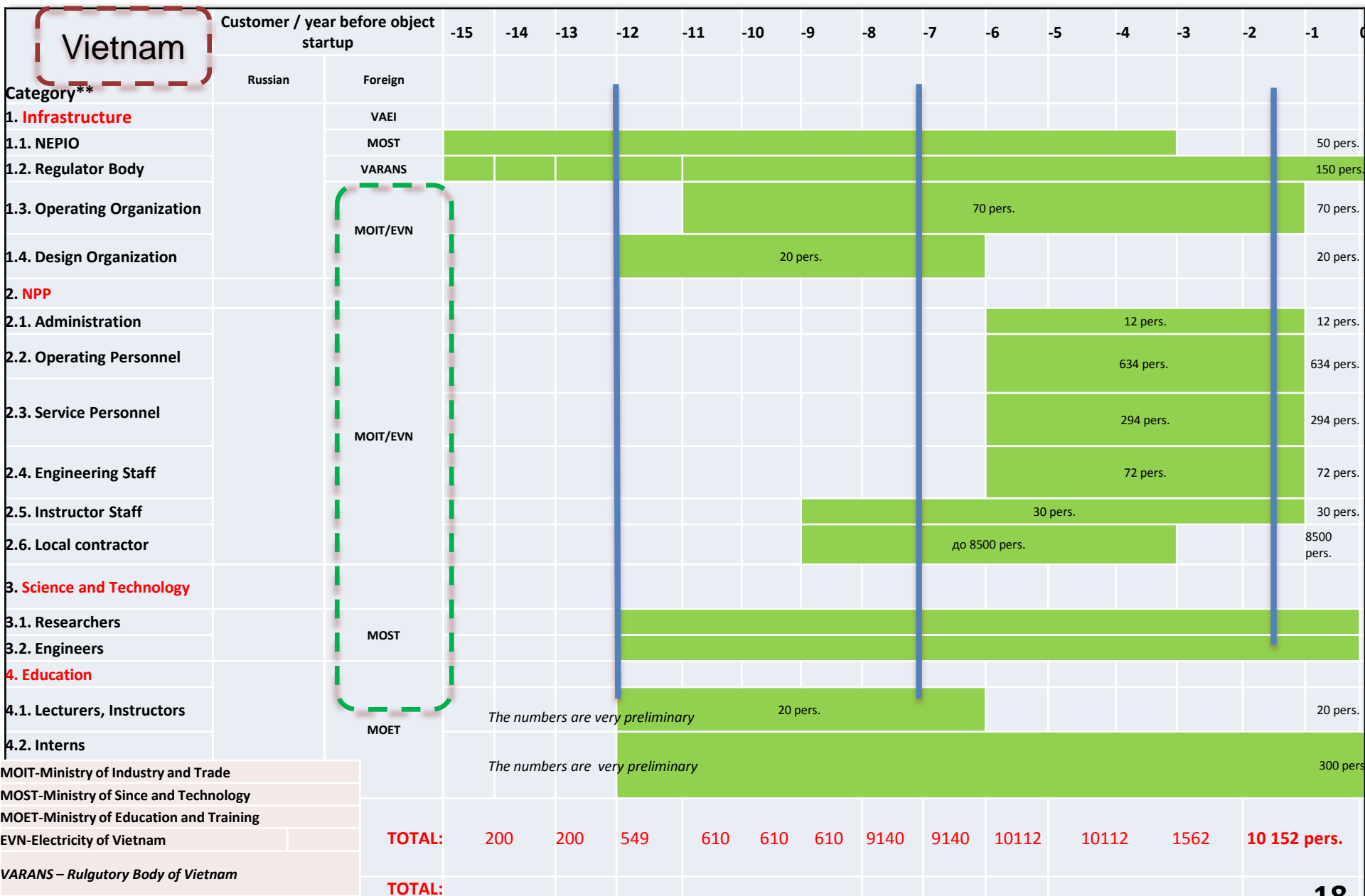
**Courses were developed in cooperation ROSTECHNADZOR (SEC “NRS”) IBRAE, GIDROPRESS and other Russian institutions**





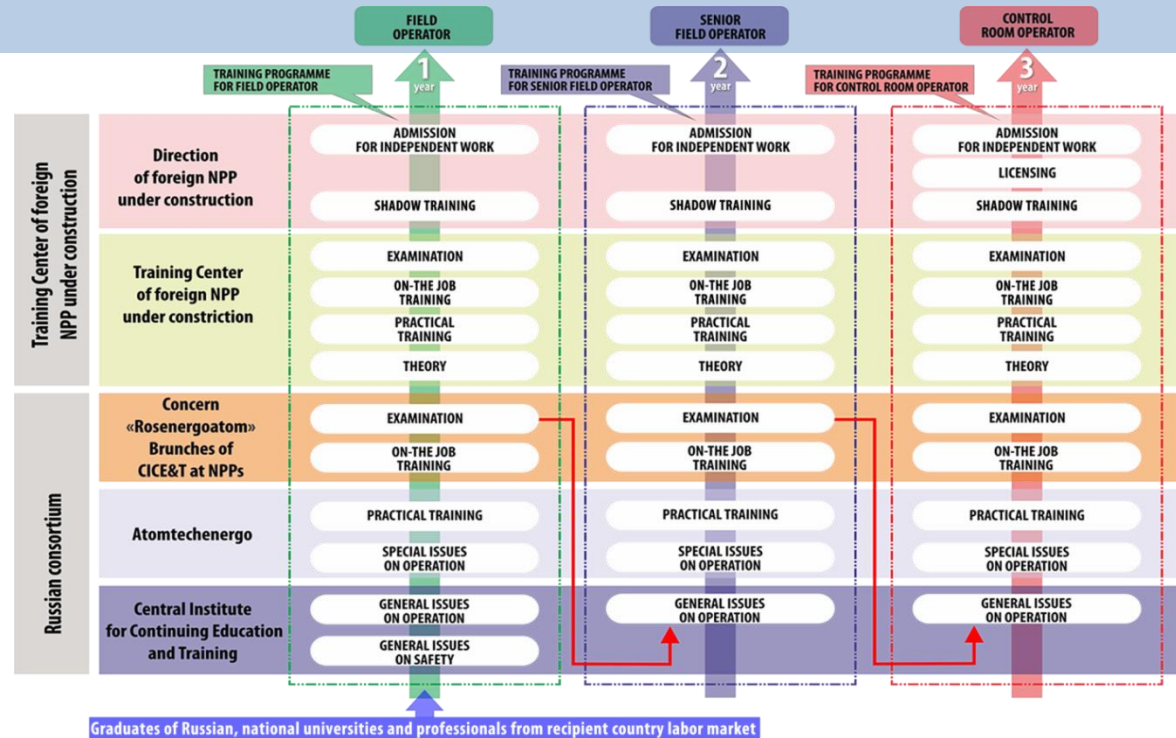
**IT - system  
control CP  
8- parameters (8D)**

- Country
- Category of personnel
- Number of personnel
- Schedule
- Training program
- Educational resources
- Budget
- Rosatom project



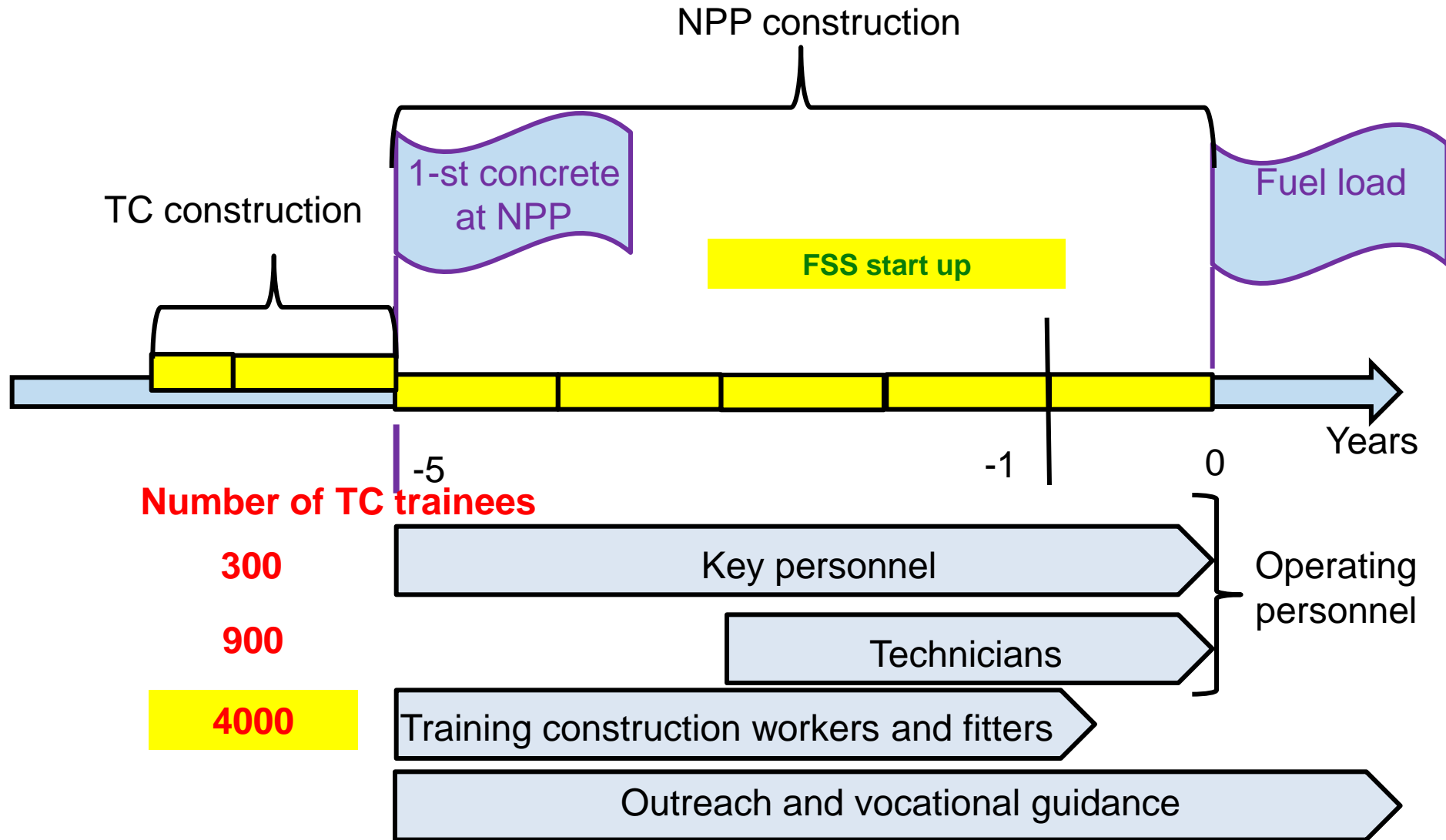
# Consortium of 4 ROSATOM Subsidiaries to Train NPP Personnel to Support Global Expansion of WWER Technology (established 11.10.2010)

- Concern Rosenergoatom – on-the-Job Training
- Atomtechenergo – practical training using mockup of NPP system
- Rosatom -CICET – theoretical courses
- VNNAES – design and installation of Full Scope Simulator



Consortium is responsible for training services for staffing the key personnel for WWER NPP to be constructed and commissioned outside of Russia

# Role of a Training Centre in NPP Startup in Newcomer Country





# Training Centre of Novovoronezh NPP-2

14.10.11



04.05.12



**Reference TC for the Emerging Nuclear Countries – Recipients of Russian NPP Technologies**

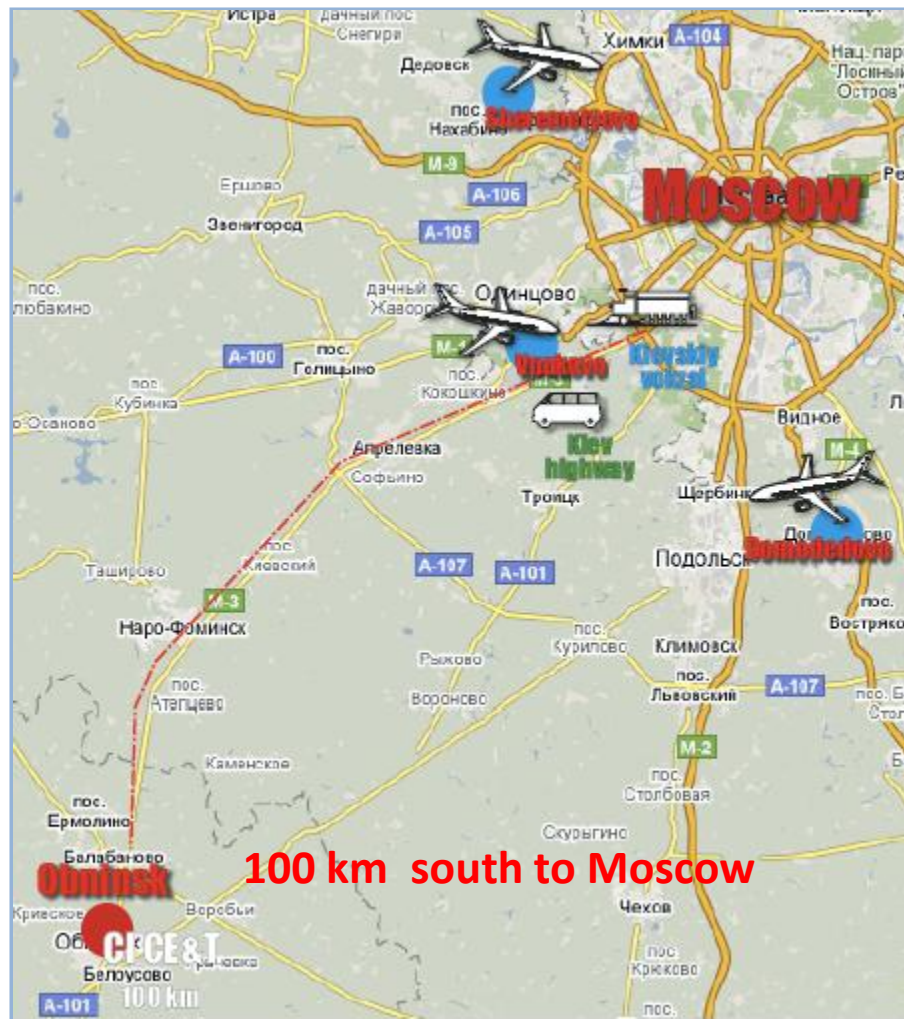
**HRD – penetrates all the other issues/elements of nuclear infrastructure development (18+)**

**HRD + Specialized Centres (TC for NPP personnel, Emergency TC, Information Centre, etc) are the basis for national nuclear infrastructure support**

**To form the joint working groups for elaboration on the Roadmap (2-3 yrs period) for each of the 19 issues/elements of nuclear infrastructure development**

**The Workshop for NEPIO specialists from the countries oriented for WWER technology (WWER Club) is going to be organized in Russia (01-05 December, 2014)**

# CICET location and contact details



<http://rosatom-cicet.ru/>

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Kaluga rgn., 249031, Russia

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