Human Resources Development Tools
Bulgarian Nuclear Sector

Challenges and Prospects

CNC Kozloduy
Centre of Nuclear Competence Kozloduy

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CNC Kozloduy

founders/members of the centre- NPP Kozloduy Plc, State Enterprise RAW, NPP Kozloduy-New Builds Plc.

Academy partners and assoc. members– Technical University Sofia, Sofia University.

Centre is officially supported by the Ministry of Energy and Bulgarian Nuclear Regulatory Agency.

Member of European Nuclear Education Network
Member of European Industrial Alliance SMR
Member of European Hydrogen Alliance

CNC Kozloduy Initiatives 2024/2025

Platform Sustainable Nuclear Innovation - Sofia 2024
NPP Kozloduy, BG Nuclear Society, BG Nuclear Regulatory Agency, TU Sofia
Young Gen Nuclear Innovation Workshop *NEA OECD*
European Innovation for Nuclear(I4N) Final *European YGN*

Regulatory Summer School
Bulgarian Nuclear Regulatory Agency
(second edition September 2025)

RAW Management School
State Enterprise RAW
(first edition May 2025)

CNC Projects & Academy - Nuclear Competence & Skills(*Euratom project Skills4Nuclear starting 2025*), Nuclear Knowledge Management(*WG*), Nuclear Innovations, Nuclear Digitalisation & AI, Climate Resilience

Under development
Nuclear Ambassadors and **Nuclear Silver Stars**

Bulgaria HR Development Challenges

HR Development challenges are for entire nuclear ecosystem

Nuclear Retirement/Aging Workforce

Preserving Critical Nuclear Knowledge

Technology Transition
AP 1000 and SMR

Deep Geological Disposal

Nuclear & Renewables Net Zero

Youth STEM and fast growing attractive industries(AI, Space, Quantum Tech.)

EU Policy(slow and insufficient)

Operating organizations

Regulatory bodies

Government institutions

Technical support organizations

Educational and training institutions

Research and development

(R&D) organizations;

Professional organizations;

Suppliers

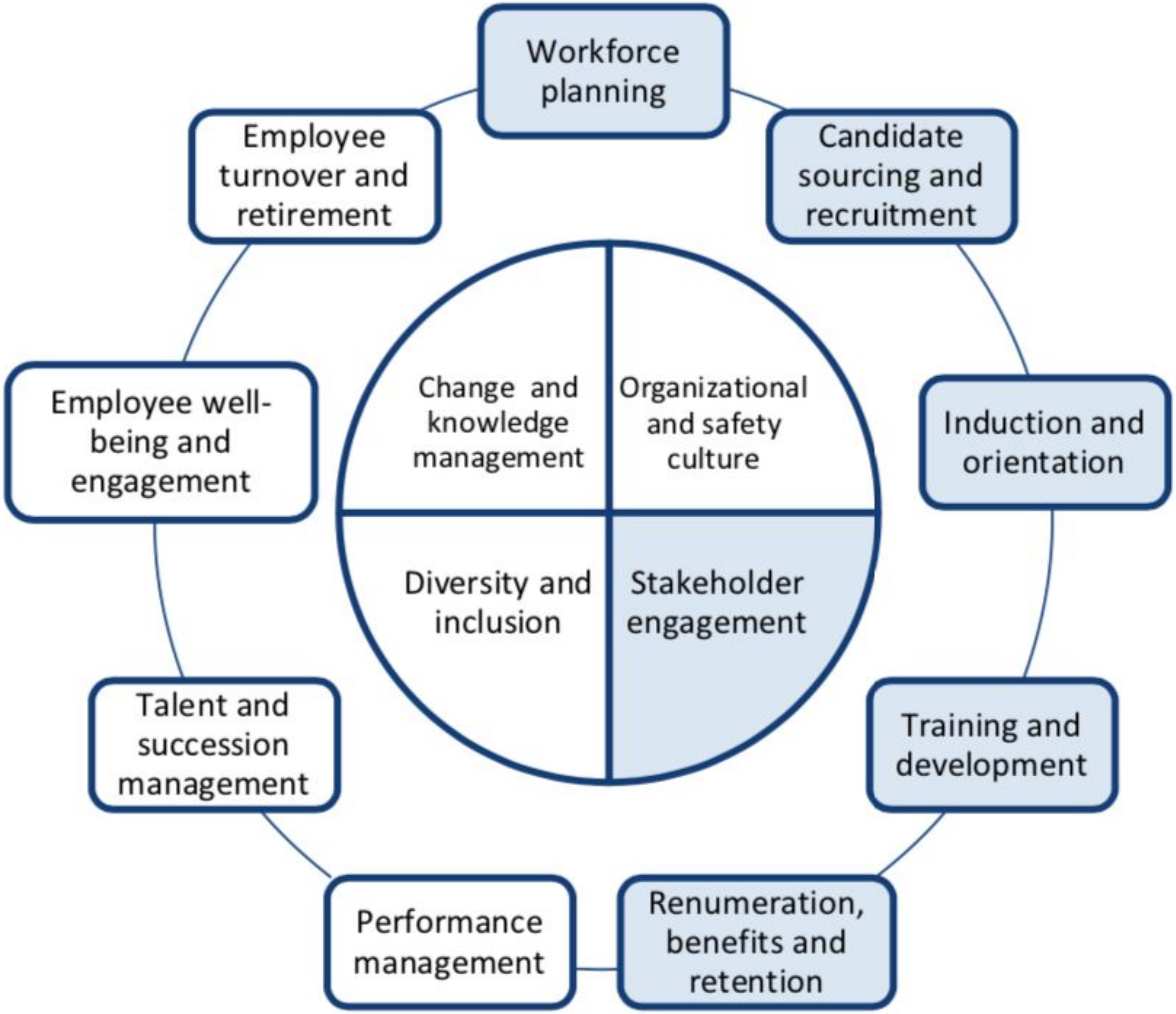
Non-governmental organizations

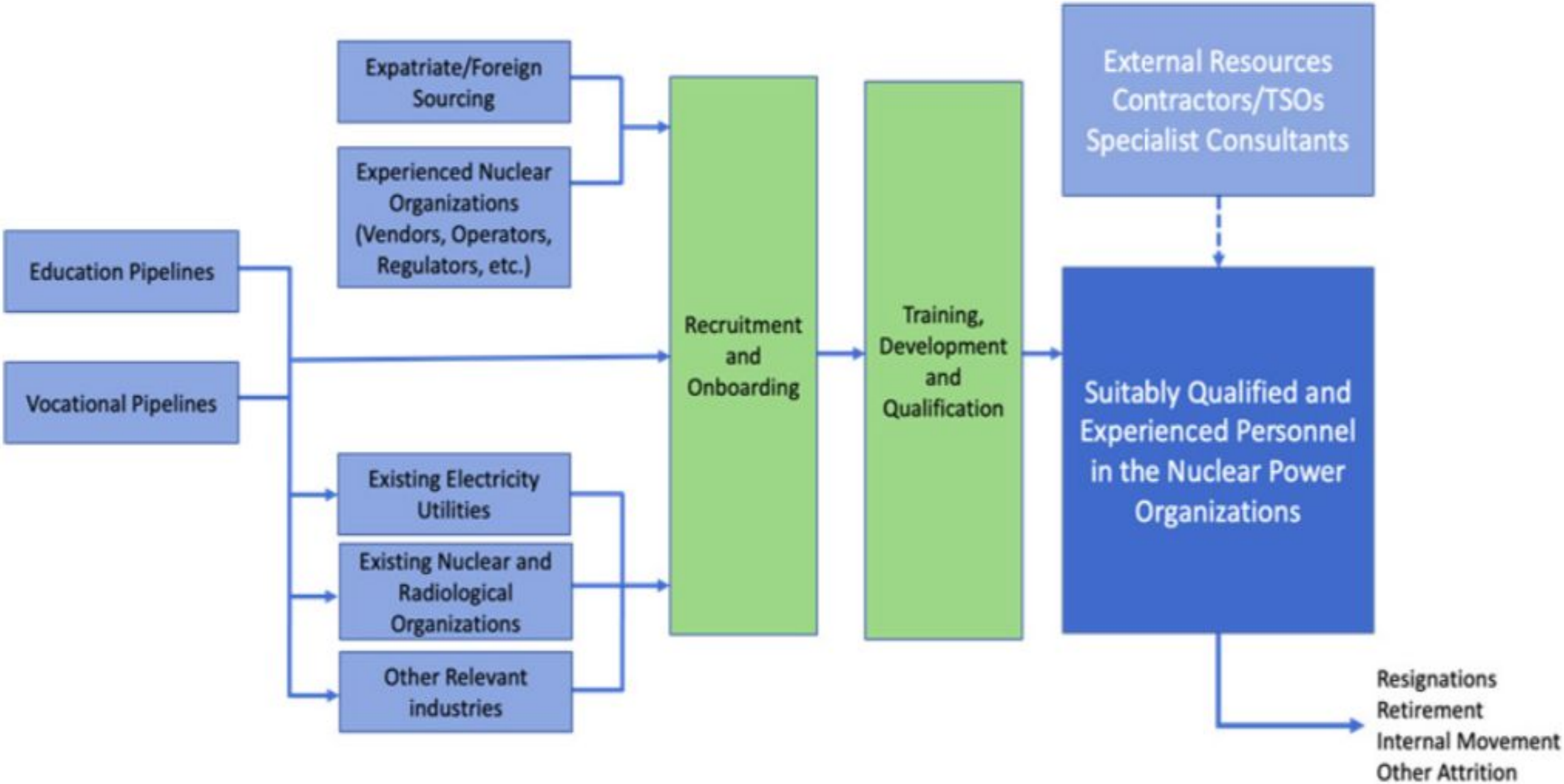
Nuclear Workforce Assessment

1. **Mapping the current workforce**
   - including job function, education level
   - competences and skills, demographics
2. **Predict future workforce demands**
   - National policies: new-build, LTO, decommissioning, Health programmes
   - Possible by use of modelling tools
3. **Mapping of HR supply to the workforce**
   - Education (academia)
   - VET programmes (re-skilling, up-skilling).
   - Research programmes (infrastructures for E&T)
4. **Analyse gaps between HR demands and supply**
   - Retirement rates, mobility, competition between sectors
5. **Develop a Nuclear Skills Strategy (Action Plan)**
   - Mitigating the HR gaps (supply to the workforce)
6. **Implement the Nuclear Skills Strategy**
7. **Monitor and review the process**

European Commission

https://www.ensreg.eu/sites/default/files/attachments/22._u_engelmann_session_2_capacity_and_skills_for_publication.pdf


Workforce planning
Candidate sourcing and recruitment
Induction and orientation
Training and development
Renumeration, benefits and retention
Performance management
Talent and succession management
Employee well-being and engagement
Employee turnover and retirement
Change and knowledge management
Organizational and safety culture
Diversity and inclusion
Stakeholder engagement



Expatriate/Foreign Sourcing
Experienced Nuclear Organizations (Vendors, Operators, Regulators, etc.)
Education Pipelines
Vocational Pipelines
Existing Electricity Utilities
Existing Nuclear and Radiological Organizations
Other Relevant industries
Recruitment and Onboarding
Training, Development and Qualification
External Resources Contractors/TSOs Specialist Consultants
Suitably Qualified and Experienced Personnel in the Nuclear Power Organizations
Resignations
Retirement
Internal Movement
Other Attrition

National Strategy Nuclear HR development

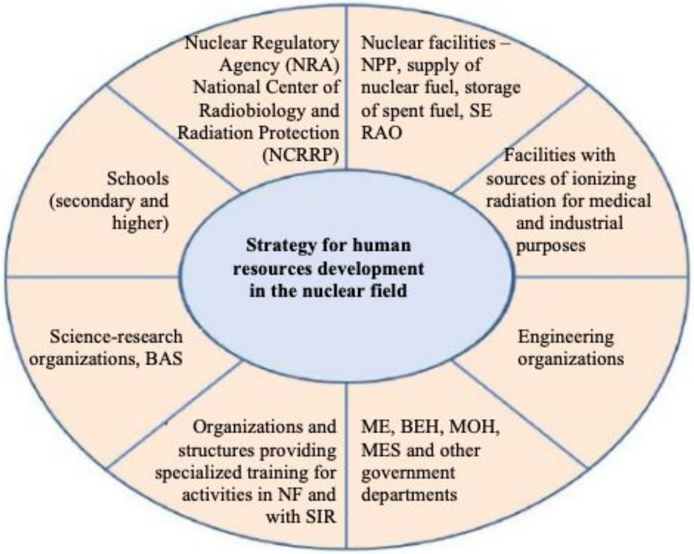


Table 2. Number and structure of the staff required for the operation of a NPP with an AP1000 reactor

Group	1 unit	2 units
Engineering Support	47	74
Technical Support	108	174
Operation	77	144
Radiation Protection	38	57
Safety	113	176
Site Maintenance	100	147
Management	19	31
Total	502	803

Table 1. Staff needs at Kozloduy NPP EAD for the period 2021-2030

Educational degree	Specialty	Number
Higher Education - Master's Degree	Nuclear Energy	76
	Electric Power Engineering and Electrical Equipment	30
	Mechanical and Instrument Engineering	29
	Physics	19
	Nuclear Energy and Technology	17
	Automation, Information and Control Engineering	17
	Machine Engineering Equipment and Technology	9
	Chemical Technologies	9
	Electronics	6
	Information Technology	5
	Chemistry	4
Higher Education - Bachelor's Degree	Electric Power Engineering and Electrical Equipment	20
	Machine Engineering Equipment and Technology	17
	Mechanical and Instrument Engineering	16
	Automation, Information and Control Engineering	12
	Computer Control and Automation	10
	Computer Systems and Technology	6
	Engineering Chemistry and Advanced Materials	4
Secondary Vocational Education	Electric Power Engineering	213
	Technology of Machine Engineering	190
	Thermotechnics – heating, air conditioning, ventilation	100
	Automated Systems	102
	Technology of Inorganic Substances	73
	Computer Engineering and Technology	48
	Nuclear Energy	42
	Electrical Equipment in Production	27
	Industrial Electronics	12
	Ship Machines and Mechanisms	7

https://bnra.bg/media/national-strategy-for-human-resources-development-in-the-nuclear-field-2022-2032.pdf

United efforts for BG Nuclear development

Strengthened institutional cooperation (Ministry of Energy, Ministry of Education, Nuclear Regulatory Agency, National Assembly)

National Nuclear HR Strategy approach

Permanent WG on the National Nuclear HR Strategy(NRA, Institutions, Operators, Educational and Research Organisations, NGOs)

New 3 years Action Plan (Nuclear HR Strategy)

New Nuclear Scientific Program(TU Sofia, Sofia University, INRNE BAS)

All stakeholders developing and improving **HR tools with great interaction**

High public trust in the Nuclear Energy and the new Nuclear Builds

Active efforts at **European and International level**

CNC Kozloduy

Human Resources

Nuclear Knowledge Management

Nuclear Innovation

for

Sustainable Energy Future

www.bgcnc.org