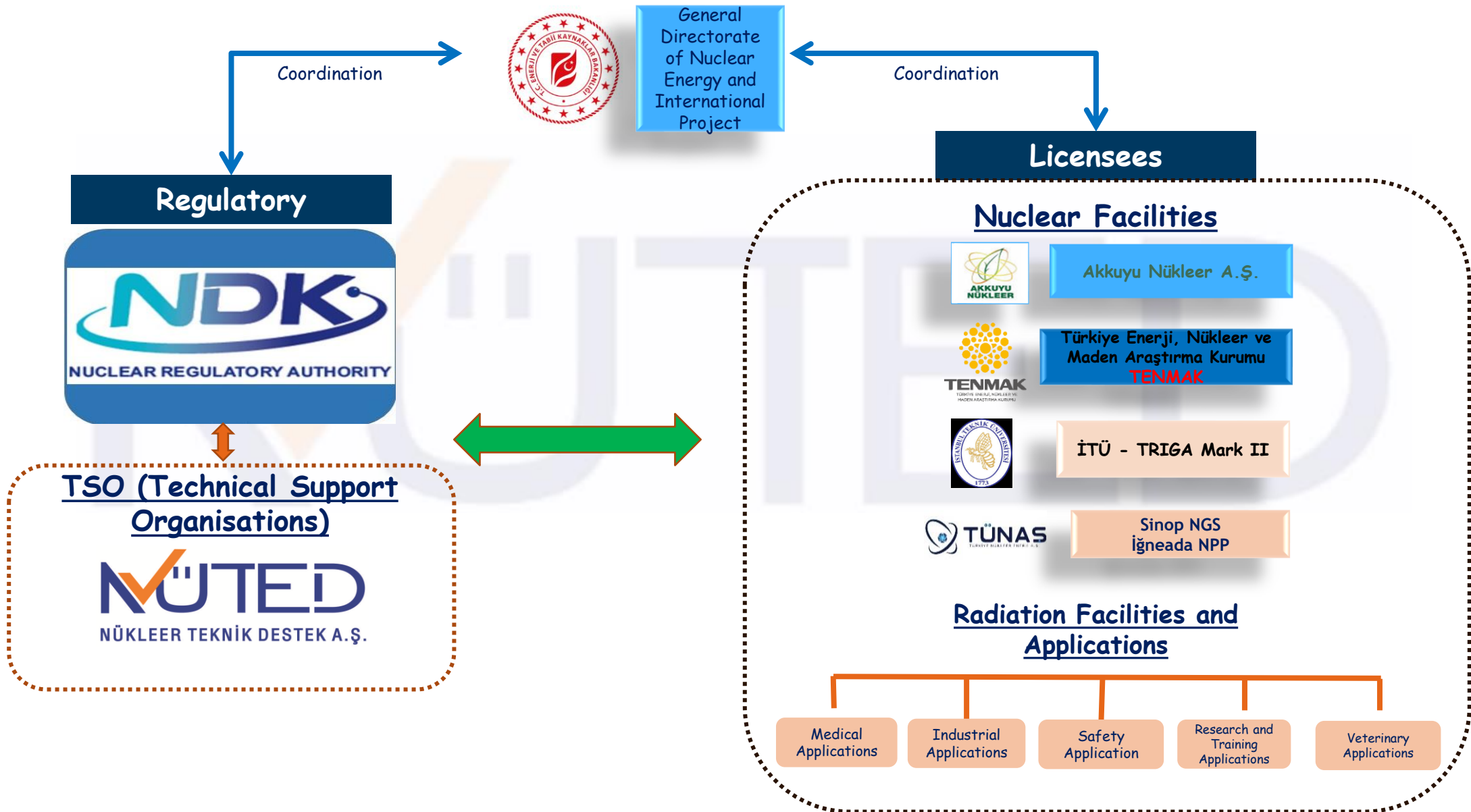


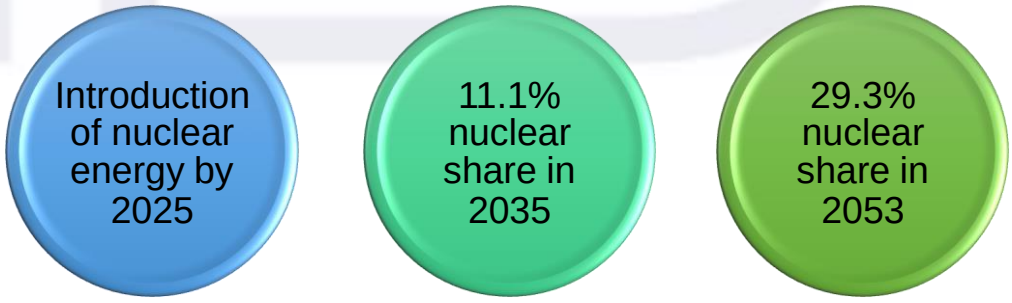
REPUBLIC OF TÜRKİYE
NÜTED (NUCLEAR TECHNICAL SUPPORT ORGANIZATION)

Yusuf CEYLAN
Mail: yusuf.ceylan@nuted.com.tr

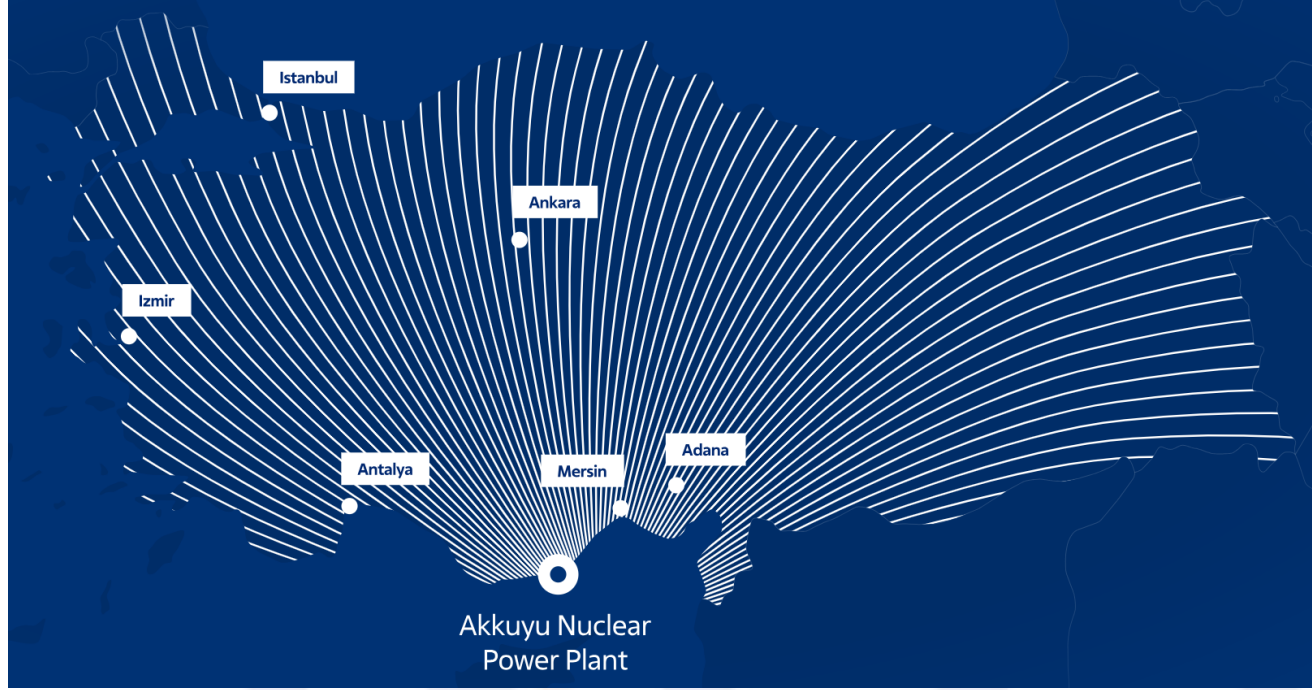
- ❖ Turkish Regulatory Ecosystem
- ❖ Nuclear Program in Türkiye (Akkuyu Project)
- ❖ Technical Support Organisation (NUTED)
- ❖ NUTED's Establishment and Development Steps and Organisational Structure
- ❖ NUTED Services and Capabilities
- ❖ Future Plan & Projection
- ❖ Challenges & Lesson Learnt
- ❖ Certificate & International Membership of NUTED



- Main characteristics of energy sector: High import dependence and high demand growth
- Net zero carbon emission target by the year of 2053
- Diversified energy strategies to achieve carbonization goal and energy supply security:
- Facilitating use of renewables, domestic energy sources and new technologies (energy storage, carbon capture andhydrogen),
 - Improving energy efficiency,
 - Peaceful use of **nuclear energy** to generate electricity and provide process heat to industry.



16 large scale reactors + SMRs (5 GW)
26 GW nuclear capacity by 2053 !!!



Location :

Mersin, Türkiye

Reactor:

4*VVER-1200

Capacity :

4*1200 MW

Project Start :

2010 (intergovernmental agreement)

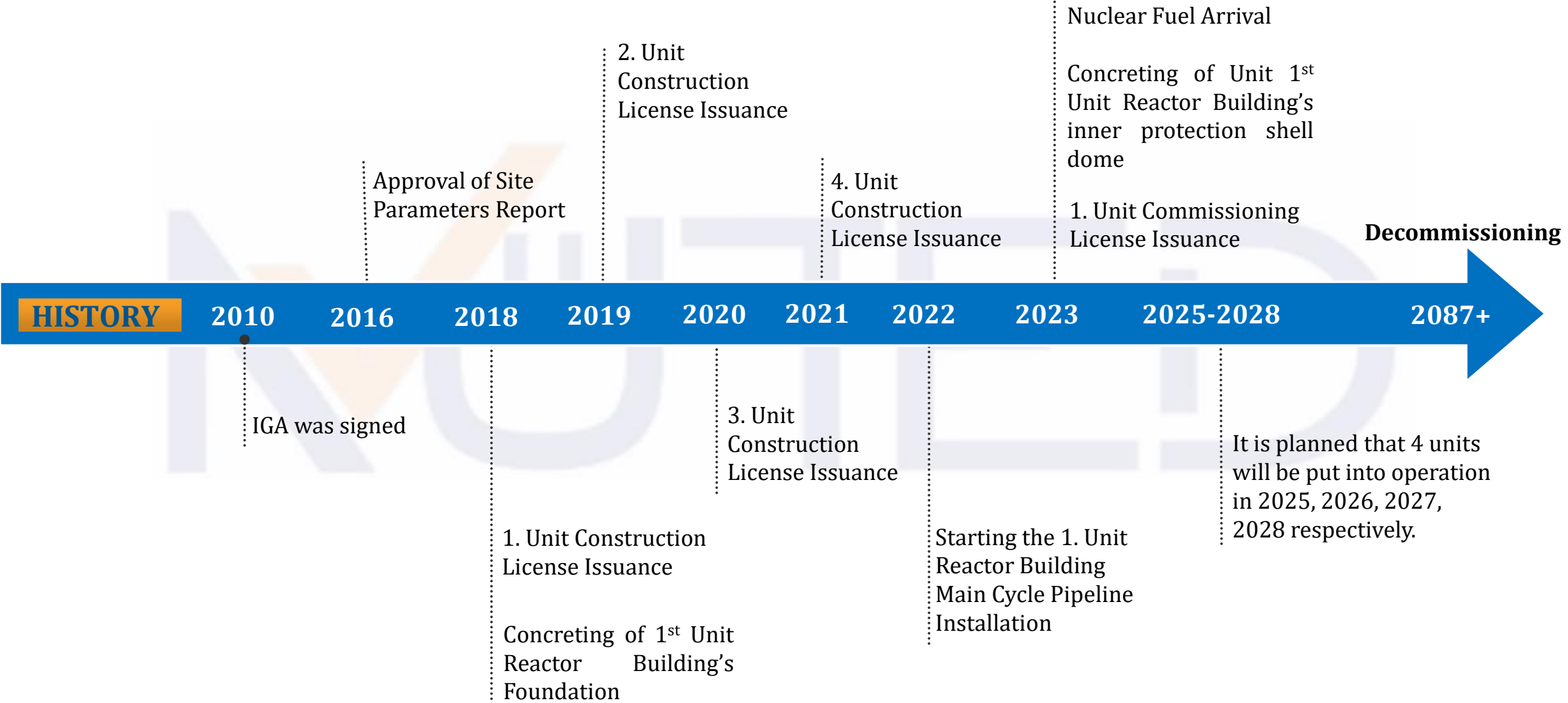
Duration of service :

60 years, which can be further extended by another 20 years

- ✓ The largest Nuclear Power Plant Construction Site in the world
- ✓ More than 25,000 employees
- ✓ More than 400 companies



- ✓ The first nuclear power plant of Türkiye under the Build-Own-Operate model
- ✓ 10% of Türkiye's electricity demand will be covered by Akkuyu NPP
- ✓ Akkuyu NPP will provide electricity to more than 12 million consumers, including civil and industrial infrastructure facilities, in more than 10 provinces of Türkiye.
- ✓ Building structures provide resilience against earthquakes with a magnitude of up to 9.0, hurricanes, floods, tsunamis up to 10 meters high and fall of a commercial aircraft
- ✓ After commissioning of all of its 4 power units, Akkuyu NPP will produce 40,000 million kWh of electricity annually



What is the Function of NÜTED?

- ☢ NÜTED provides technical and scientific support to the Turkish Nuclear Regulatory Authority «NDK» and its regulatory functions as well as the associated activities and processes to maintain the needed level of expertise, state of the art tools and equipment.
- ☢ NÜTED's main support functions are authorization, review and assessment, analyses, inspections, trainings, drafting regulations and guides.



NÜTED Ankara Ofisi/Office

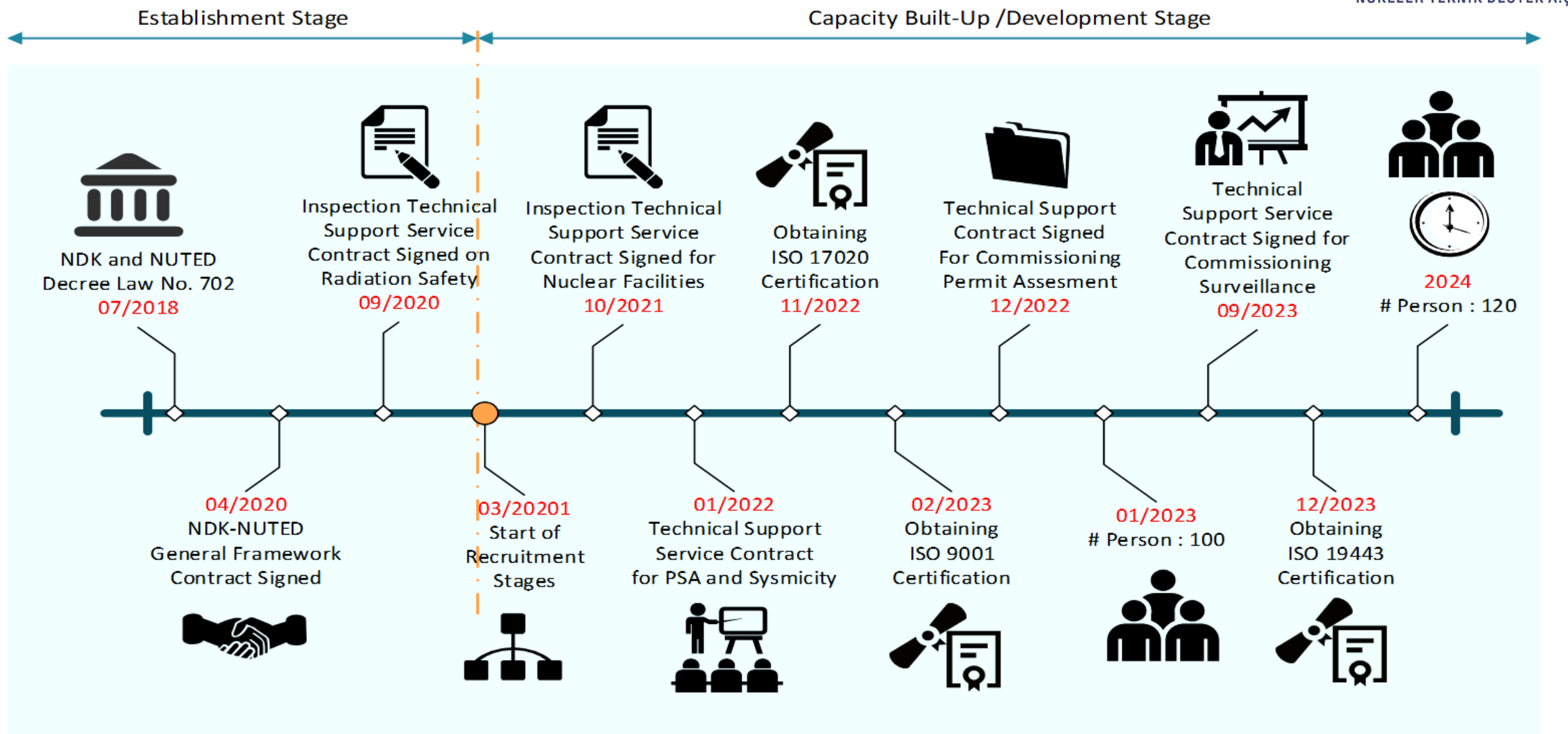


Moscow Office

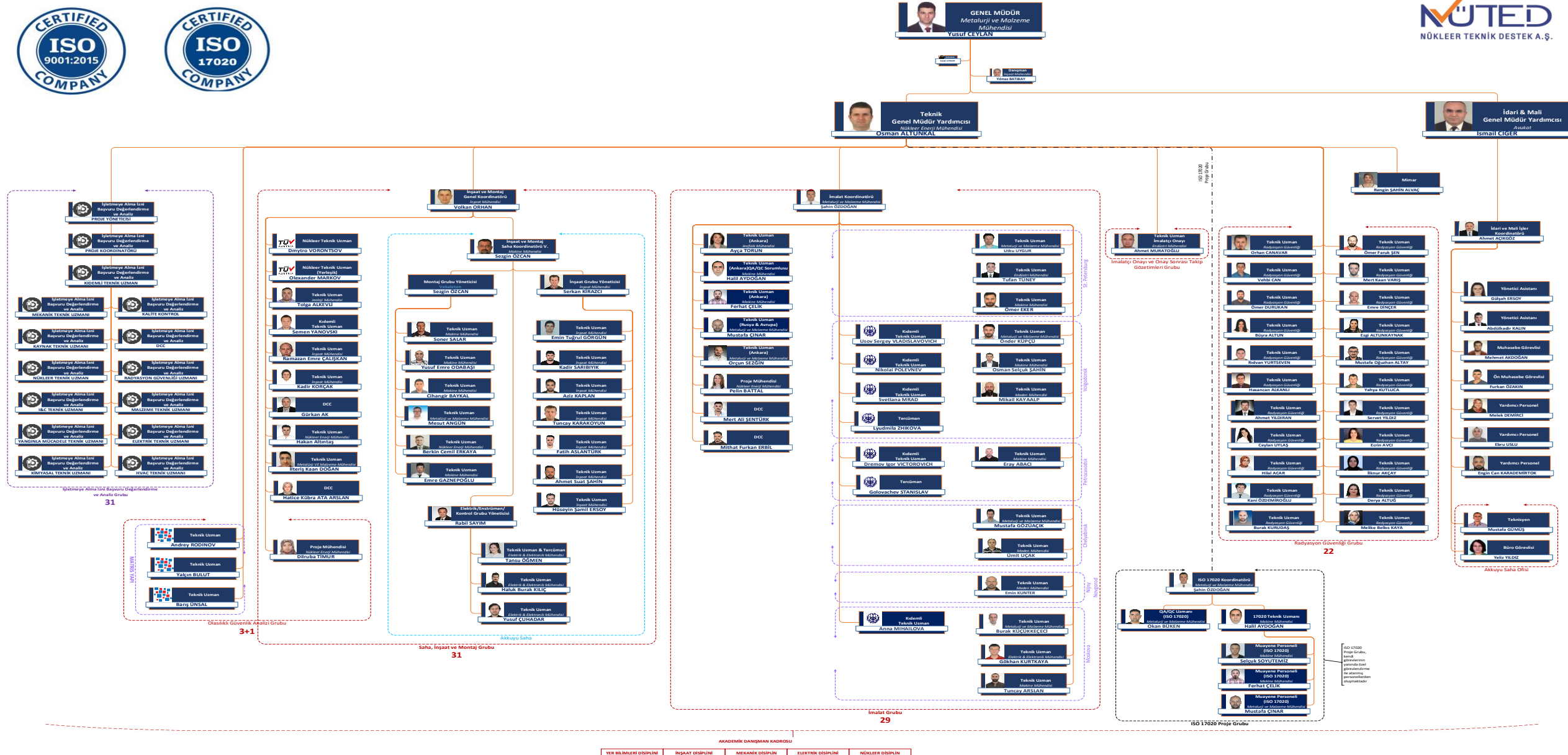


Akkuyu Site Office

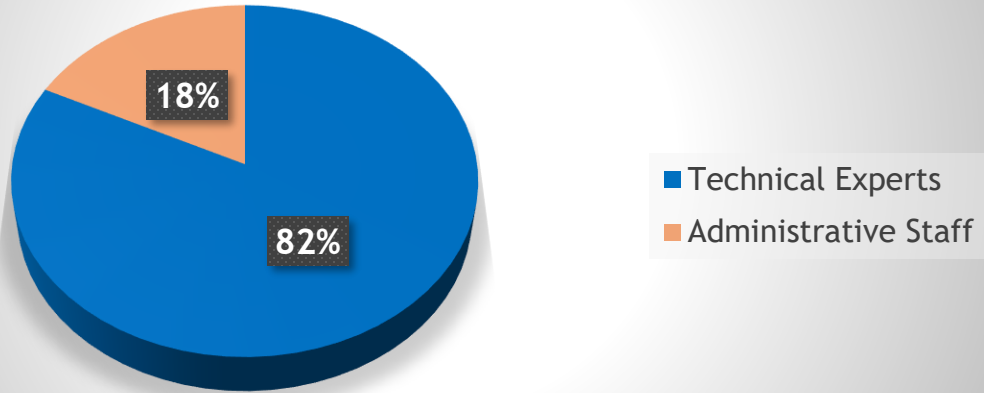
NUTED's Establishment and Development Steps



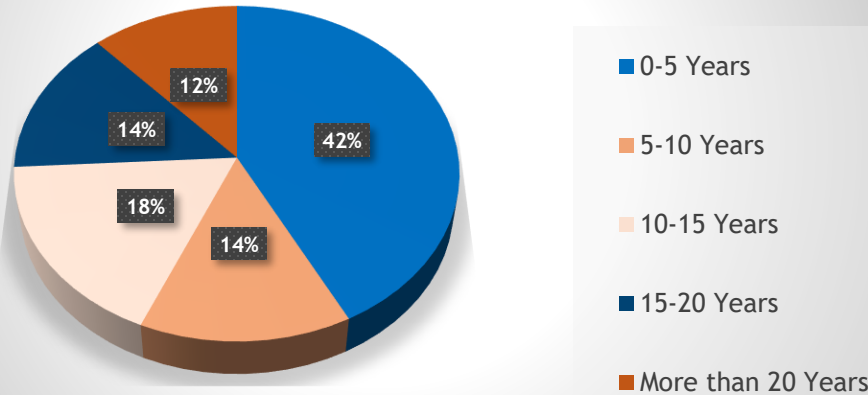
NÜTED ORGANİZASYON ŞEMASI



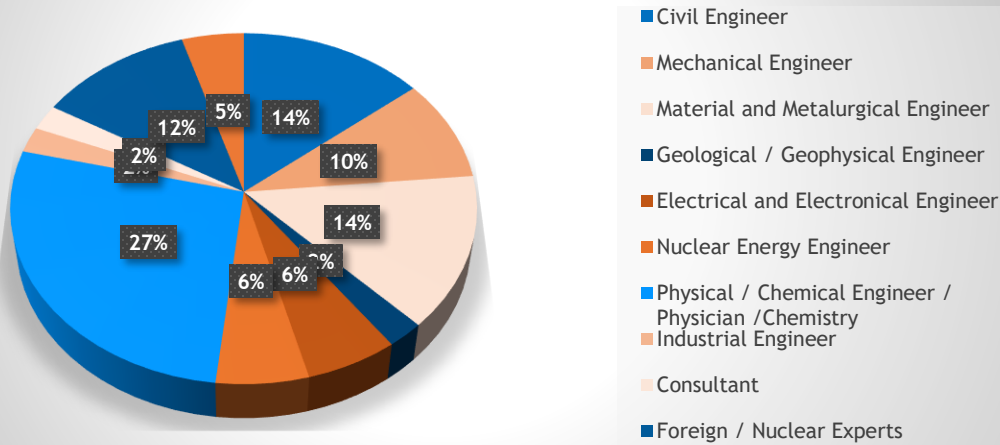
NÜTED Staff Distribution



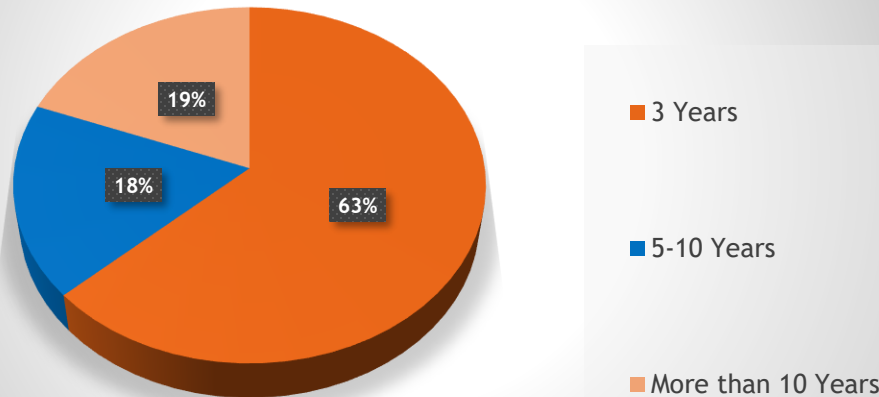
NÜTED Technical Expert Distribution
(According to Expertise)



NÜTED Technical Expert Distribution
(According to Disiplines)



NÜTED Technical Expert Distribution
(According to Nuclear Expertise)



Surveillance/Inspection Services for;

- ☢ Site Activities, (site selection and site characterization)
- ☢ NPP Construction, Installation & Commissioning Stages,
- ☢ NPP Equipment Manufacturing Stage
- ☢ Radiation Facilities and Sources

Licensing, Analyses, Safety Review and Assessment Services for;

- ☢ Preparation of Site report and PSAR
- ☢ Review and Assessment of the Construction and Commissioning License Application
- ☢ Probabilistic Safety Analysis for level-1, Level-2, and Seismic

Qualification, Training and Certification Services;

- ☢ Nuclear Equipment Vendor Qualification and Approval (Manufacturer Qualification and Certification)
- ☢ Personal Qualification (NPP Equipment Inspection, On-site Inspection for site and Construction, Radiation Protection and Radiation Applications)
- ☢ Nuclear Inspector Qualification OJT
- ☢ Nuclear Safety and Nuclear Culture Training



- ✓ *Over 100 technical experts, more than 40% of whom have 15 years of experience and 40% of whom have at least 3 years of nuclear experience.*

- ✓ *Inspection of 40,000 control points...*
- ✓ *Produced more than 15,000 documents (surveillance & weekly & findings report, procedure, checklist, etc.)*



NUTED Services for Akkuyu Project (On-Site Inspections)



✓ *30 resident inspector
on Akkuyu Site*

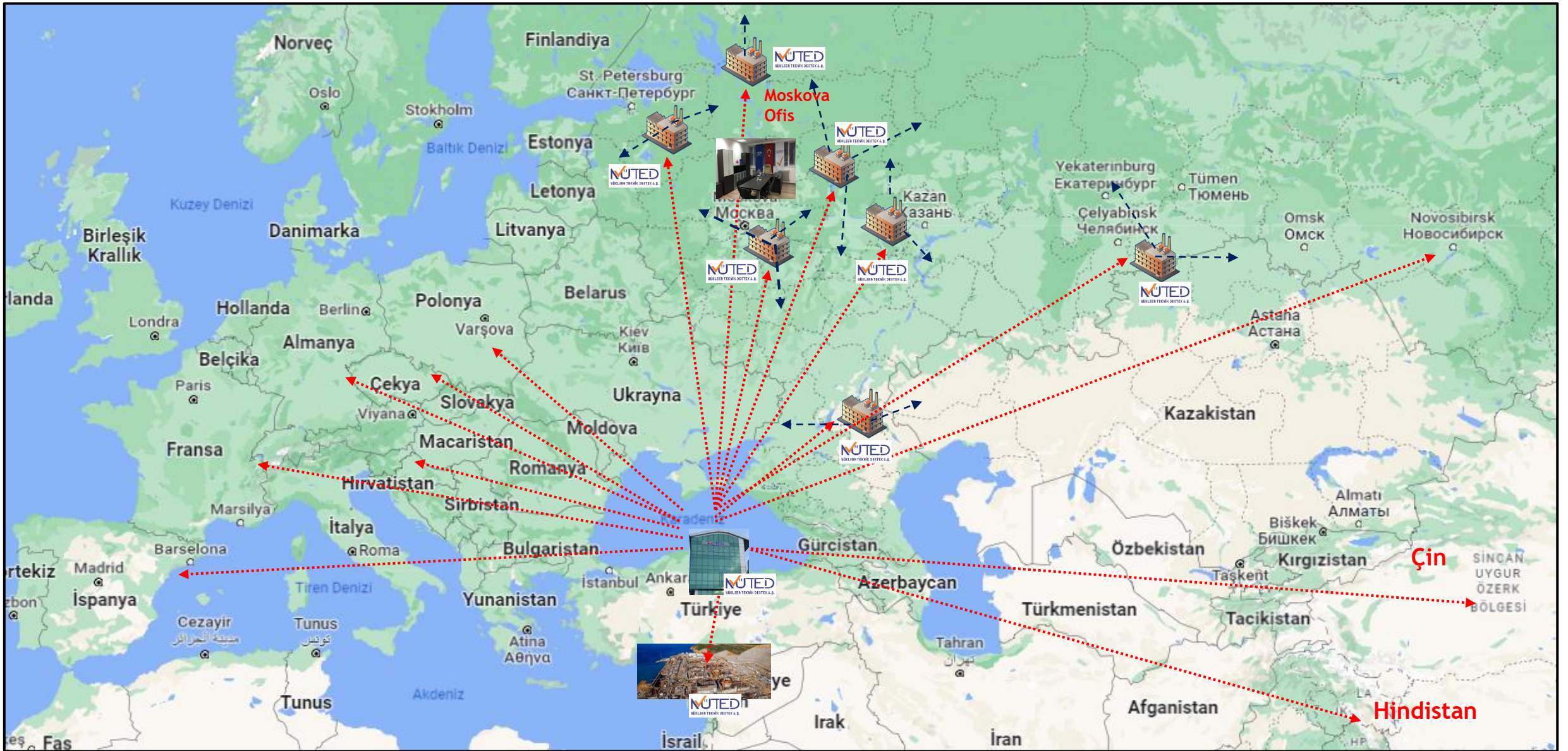
✓ *More than 10.000
inspections for Siting,
Construction and
Commissioning phases.*

NUTED Services for Akkuyu Project (Manufacturing Inspections)

For the Akkuyu Project, NUTED is giving services to NDK with the capacity to carry out inspections in 180 different manufacturers in 20 countries with the team of 35 resident and Call-based inspectors



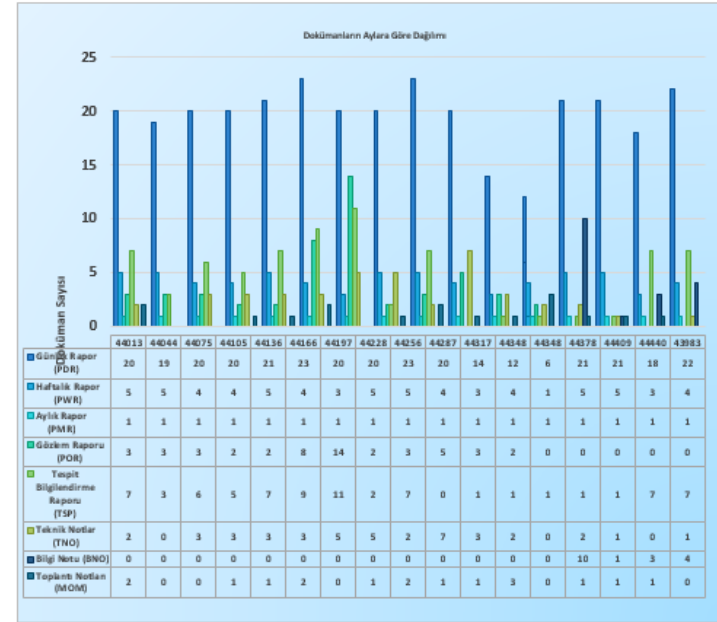
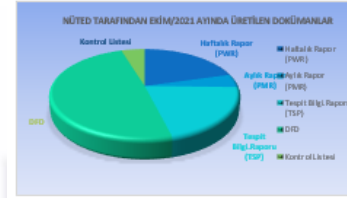
NÜTED Services for Akkuyu Project (Locations of Manufacturer and Resident inspectors)





- ✓ *50 technical experts with over 10 years of experience, more than 3 years of nuclear experience.*
- ✓ *More than 15.000 on-site inspections*
- ✓ *More than 16.000 documents*
- ✓ *More than 10.000 inspections*

NÜTED
NÜKLEER TEKNİK DESTEK A.Ş.



Ad	Değiştirme tarihi	Tür
01_DTL	20.05.2021 09:50	Dosya klasörü
02_SYSTEM DOCUMENTATION	31.03.2021 10:39	Dosya klasörü
03_FORM	2.10.2019 16:54	Dosya klasörü
04_PLAN	12.03.2019 11:50	Dosya klasörü
05_EMPTY FILE	7.05.2019 14:53	Dosya klasörü
06_LIST	3.09.2019 16:43	Dosya klasörü
07_REPORT	31.03.2021 10:59	Dosya klasörü
08_WORK_PROGRAMME	4.05.2021 14:03	Dosya klasörü
09_MEDIA	14.04.2021 12:03	Dosya klasörü
10_DIGITAL PLATFORM	25.06.2020 09:17	Dosya klasörü
11_WORKSHOPS	29.01.2021 16:01	Dosya klasörü
12_RECEIVED_DOCUMENTS	11.02.2019 16:02	Dosya klasörü
13_LITERATURE	21.04.2021 13:52	Dosya klasörü
14_PRESENTATIONS	19.03.2021 16:52	Dosya klasörü
15_APPROVED DOCUMENT	15.04.2019 15:00	Dosya klasörü
16_OTHER FILES	5.11.2019 17:20	Dosya klasörü
17_MDR	7.01.2021 15:08	Dosya klasörü
18_WBS	28.02.2020 18:13	Dosya klasörü
19_IAEA	16.05.2019 16:52	Dosya klasörü
20_TRAINING	26.02.2021 15:23	Dosya klasörü
21_Presentations by Nuclear Experts	2.04.2021 17:30	Dosya klasörü

Technical Support for Inspection and Licensing Activities

- ☢ Supporting Regulatory Authority's inspection activities for Commissioning and Operational phases
- ☢ Supporting Regulatory Authority's licensing process from Commissioning phase and Operational phases

New Nuclear Project

- ☢ To give Support to Regulatory Authority or Licensee' for Review Assessment and Oversight for whole Life-Cycle of NPP from Siting to Decommissioning phase ;Turkiye, Hungary, Egypt & Uzbekistan NPP Projects
- ☢ Supporting the Regulatory Authority or Licensee' for Equipment manufacturing, construction and Comissioning Phase.
- ☢ To Establish infrastructure for New-Comer Countries.
- ☢ Training to the New Comers

Certificate and International Membership

IAEA NUCLEUS			
IAEA GNSSN Global Nuclear Safety and Security Network			
TSOF About TSOF Membership Our Services Events Thematic Working Groups Workshops			
TSOF Members			
Title	Abbreviation	Country	Logo
AECL Nuclear Laboratories	AECL (Canada)	Canada	AECL
Bel V	Bel V (Belgium)	Belgium	BEL
Canadian Nuclear Safety Commission (CNSC)	CNSC (Canada)	Canada	
Italian National Agency for New Technologies, Energy and Sustainable Economic Development	ENEA (Italy)	Italy	ENEA
Gesellschaft fuer Anlagen- und Reaktorsicherheit (GRS) mbH	GRS (Germany)	Germany	GRS
Josef Stefan Institute	IJS	Slovenia	
Institute for Radiation Protection and Nuclear Safety	IRSN (France)	France	IRSN
ITER-Consult srl	ITER (Italy)	Italy	ITER
Korea Institute of Nuclear Safety (KINS)	KINS (Republic of Korea)	Korea, Republic of	KINS
Lithuanian Energy Institute	LEI (Lithuania)	Lithuania	LEI
Nuclear Technology Support Center, China Atomic Energy Authority (CAEA)	NSC (China)	China	
NÜTED	NÜTED (Türkiye)	Türkiye	NÜTED
Russian Nuclear Regulatory Authority	RSBA (Russia)	Russia	
Scientific and Engineering Centre for Nuclear and Radiation Safety	SEC NRS (Russian Federation)	Russian Federation	SEC NRS
State Scientific and Technical Center for Nuclear and Radiation Safety	SSTC (Ukraine)	Ukraine	
State Enterprise "State Scientific and Technical Center for Nuclear and Radiation Safety" (SSTC NRS)	SSTC NRS (Ukraine)	Ukraine	
National Radiation Protection Institute	SURO (Czech)	Czech Republic	
VTT Technical Research Centre of Finland	VTT (Finland)	Finland	
VAU JRC	VAU JRC	Slovakia	



UAEA- TSOF
Membership from 2022

ISO 9001

ISO 17020

- ✓ Lack of human sources in Nuclear...
(Find the professionals from similar industries such as Oil and Gas, Abroad Project etc..)
- ✓ Lack of experience with new Nuclear Technology...
(Hiring experienced professionals from the countries which are using similar technology)
- ✓ Sustainability of the Company Resources with the different stages of Project...
(Possibility to give services to similar industries or newcomer countries)
- ✓ Dependency to Project Schedule (uncertainties of the Project)...
(Planning and acting proactively for the different possibilities of the project.)

Thanks for Listening....



Yusuf CEYLAN

Mail: yusuf.ceylan@nuted.com.tr