TWINNING CONTRACT
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Improvement of Nuclear Safety Regulatory Infrastructure of Turkey

STUDY VISIT REPORT

on

Mission 2 of Activity 4.3: Study Visit at Headquarters of TÜV SÜD Industrie Service GmbH regarding Human Resource Management Issues

23- 27 July 2018

Mission carried out by

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List of Abbreviations

BC : Beneficiary Country
KKS : Kraftwerk-Kennzeichnungs-System
KTA : erntechnischer Ausschuss
MS : Member State
NPP : Nuclear Power Plant
PSA : Probabilistic Safety Analysis
TAEK : Turkish Atomic Energy Authority

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Executive Summary

Study visit for representative of TAEK’s Department of Nuclear Safety to TÜV SÜD was organized in order to introduce with current practice and experiences in the field of human resources management.

The study visit program included presentations, discussions based on practical issues and examples that have insured better understanding. The following topics were covered through Study visit program:

1. Introduction to TÜV SÜD organization and general tasks.
2. How to plan human resource capacity building in the light of the expectable future works of TAEK.
3. Technical visit to Munich, Landshut NPP Isar II during outage/maintenance.

1. General comments

This study visit report was prepared within the IPA 2013 Twinning Project “Improvement of Nuclear Safety Regulatory Infrastructure of Turkey”.

Main purposes of the study visit were:

- Usage of knowledge and experience of MS in order to introduce human resources management,
- Gaining knowledge on how to apply training programme,
- Applying MS best practices in TAEK.

BC expert (participant of the study visit) would like to express big gratitude to all officials and individuals met, for good organization, kind hospitality and valuable information received during the study visit.
2. Lessons Learned

Participants were introduced to information on historical development, organizational structure, end to end solutions for the entire business lifecycle, worldwide nuclear presence, and nuclear service portfolio of TÜV SÜD. TÜV SÜD was assigned as the technical support organization of nuclear regulatory body in Bavaria region. There are 3 strategic business segments as mobility, industry, and certification. For nuclear solutions & services, TÜV SÜD is dedicated to increase safety and add economic value to its nuclear energy clients. It has been seen that TÜV SÜD has 7 nuclear service steps for nuclear installations from design to decommissioning.

After the incident of Fukushima in the year of 2011, the government of the Germany decided to stop all the NPPs in the country until 2022. In 2011 TÜV NORTH was oversight 8 units of NPPs and TÜV SÜD was oversight 11 units of NPPs. Currently TÜV NORTH is taking care of 3 and TÜV SÜD is taking care of 4 units of NPPs. Correspondingly TÜV SÜD was decided to decrease the number of staff in the following years. On the other hand TÜV SÜD is not only in nuclear area but also they have some other business branches, they were reorganized and they are saving current staff. Expert from the TÜV SÜD presented the organization chart as it can be seen in the figure.

![Organization chart in the area of nuclear](image-url)
TÜV SÜD’s nuclear activities are organized according to needed disciplines. There are main departments with following operational sections below:

- Process Technology, Electrical and I&C-Systems
  - Electrical Systems and Grids, EMC
  - Instrumentation and Control Systems
  - Reactor Core and Plant Dynamics
  - Safety and Risk Management
  - System and Process Engineering

- Safety and Mechanical Engineering
  - Security and IT-Security
  - Structures and Seismology
  - Hoists and Dismantling
  - Building Services

- Radiation Protection and Waste Management
  - Radiation Protection Officer
  - Radioactivity Measurement and Decommissioning
  - Activity Flow and Waste Management
  - Occupational Radiation Protection

- Power Plant and Component Engineering
  - Steam Boiler Plants
  - Piping Systems
  - Components with Functional Requirements
  - Power Systems and Performance Tests
  - Numerical Analysis and Fracture Mechanics

- Process and Manufacturing Engineering
  - Pressure Equipment, Tank Engineering, Hydrogen Technology
  - Material and Manufacturing Process
  - Non-destructive Testing
- Project Management Nuclear

It was emphasized that almost all the technical staff spending half of their time in the office and half on the site. It was clearly seen that there is no differentiation between assessor and inspector. All the staff have responsibilities in both positions. It was underlined that the most important issue is to have enough competency in legislation and review & assessment criteria in related working area. There are bunch of professions to carry out the duties like engineers, mathematicians, physicist, geologist, etc. furthermore TÜV SÜD employs psychologist for assessing human factor in the field of PSA and operation.

In TÜV SÜD, all the projects (each NPP-Unit is one project) have a manager for coordination between the licensee and TÜV SÜD and for the calculation of workload in man/hour annually (Figure - 2). Also if any informative letters comes from the licensee for any kind of work, these managers decide which departments will take part in this work.

![Workload estimation](image)

Figure – 2 Workload estimation

According to the envisaged work load every main department assesses their own capacity with the number of staff and the competencies according to the necessary technical skills and knowledge. Moreover if there is a gap in the workforce they start the recruitment process. First of all Main Department Head has to prepare a report to justify what kind of tasks needed. According to this report there are two kind of recruitment way, internal and external (Figure - 3). Every departments have to give priority for internal nominees for any job vacancies. If there
is no available person in TÜV SÜD then external nominees are being taken into account.

Figure – 3 TÜV SÜD Recruitment (internal / external)

After selection of nominee first six months is called trial phase. Main department head assigns a mentor and composes a training programme with the help of the mentor (Figure – 4).

Figure – 4 Initial Training Programme

For the training there are 3 main groups of training modules below:
Training modules specific to the work within TÜV SÜD group (mandatory for all staff, e.g. how to use the document management systems, safety culture, reporting system)

Training modules specific for the area in which the new staff will work (nuclear, amusement rides, e.g. Reactor Physics, Reactor Thermodynamics)

Training modules specific for the job (fire protection, cyber security etc.)

At the end of the six months, nominee prepares a work report on the basis of a specific work the nominee is doing after finishing training. The nominee shall work alone and show that he/she is able to use the newly gained knowledge. The mentor makes a decision if the work is conducted in a suitable way or not. But it was highly emphasized that it takes 3-4 years to give full responsibilities to the staff and furthermore it takes almost 10 years to become a senior staff.

In TÜV SÜD there different tools for training except mentoring. They have some collaborations with universities or research centers for the training of the new staff. For the current staff it is foreseen to conduct annually 3-5 days of specific training.

It has been understood that there are no specific procedures related with personnel training. Training of the staff is own responsibility of the main departments heads.

For the knowledge transfer, if one staff is going to leave, he works with the successor at least 6 months to explain “what he does and how he does”. Besides, he integrates the successor to the working system. On the other hand there are nearly all documents from former projects of TÜV SÜD archived in a huge document management system and therefore can be used as best practice examples for future works.

Within the scope of this scientific visit the participant visited the NPP Isar II near town Landshut during its annual outage/maintenance. Commercial operation of NPP Isar 2 started in 1988. NPP Isar 2 is a pressurized water reactor (model KWU DWR 1300). Net installed electric capacity is 1400 MW. The plant safety system in use at NPP includes both passive and active safety devices. Regular operation of Isar II will end in 2022. There is a fuel assembly container storage facility which is used for mid-term storage. Each container in the interim storage facility has an envisaged storage time of no more than 40 years.

Before entering the restricted area, participant was informed about safety rules which describes the binding instructions during the site visit. Participant was given special clothes and individual dosimeters for the monitoring of the dose taken. In this tour participant had chance to visit reactor building (UJA and UJB according to KKS code), auxiliary building (UKA) and turbine building (UMA). Because the outage was almost over the workers were collecting the
tools that they were using during the maintenance. Every tool was measured for any contamination risk by the radiation protection staff of the licensee.
3. Conclusions and recommendations

1. Experience gained from this SV will be used in further development of human resources management in TAEK.

2. Experts from TÜV SÜD expressed their experiences, difficulties and problems in all the areas related with human resources.

3. These experiences will be used in process of development of TAEK and will directly contribute in reaching our goals planned through IPA 2013 Project.
Annex 1. Programme

Monday 23 July (Venue: TÜV SÜD Industrie Service GmbH - Munich)

10:00-11:00 Administrative arrangements
11:00-12:00 Introduction
12:00-13:00 Lunch
13:00-15:30 Presentation of TÜV SÜD’s nuclear business

Tuesday 24 July (Venue: NPP ISAR-2 in Niederaichbach - Landshut)

8:00-10:00 Radiation Protection Check-In – Safety Briefing
10:00-12:00 Plant-tour Turbine-Building
12:00-13:00 Lunch
13:00-16:30 Plant-tour Reactor and auxiliary building

Wednesday 25 July (Venue: TÜV SÜD Industrie Service GmbH - Munich)

9:00-11:00 Meeting with Responsibles of Main Department Safety and Mechanical Engineering
11:00-12:00 Meeting with Responsibles of Main Department Process Technology, Electrical and I&C-Systems – Part 1
12:00-13:00 Lunch
13:00-16:30 Meeting with Responsibles of Main Department Process Technology, Electrical and I&C-Systems – Part 2

Thursday 26 July (Venue: TÜV SÜD Industrie Service GmbH - Munich)

9:00-12:00 Meeting with Responsibles of Main Department Power Plant and Component Engineering
12:00-13:00 Lunch
13:00-16:30 Meeting with Responsibles of Main Department Radiation Protection and Waste Management

Friday 27 July (Venue: TÜV SÜD Industrie Service GmbH - Munich)

- 9:00-12:00 Meeting with Responsibles of Main Department Project Management Nuclear
12:00- Adjourn of the SV
Annex 2. Persons met

- Head of Energy and Systems
- Head of Project Management in Nuclear
- Head of Main Department of Process Technology, Electrical and I&C Systems
- Head of Main Department of Safety and Mechanical Engineering
- Head of Main Department of Power Plant and Component Engineering
- Head of Department of Security and IT-Security
- Head of Department of Hoists and Dismantling
- Head of Department of Structures and Seismology
- Head of Department of Building Services
- Head of Department of Instrumentation and Control Systems
- Head of Department of Radioactivity Measurement and Decommissioning