TWINNING PROJECT TR 13 IPA NS 01 16 R
IMPROVEMENT OF THE NUCLEAR SAFETY
REGULATORY INFRASTRUCTURE OF TURKEY

Mission Report
ACT. 4.2
(Workshop 3)

„Factory Acceptance Test of a Pump at the Premises of Layne Bowler Pompa Sanayi A.S."

Mission carried out from
- 16th October – 19th October 2018

Date of Workshop:
- 16th October – 18th October 2018

Place of Workshop:
- Presidential Building of TAEK Headquarters
- Test rig of Layne Bowler Pompa Sanayi A.S.

Mission carried out by
- [Removed], TÜV SÜD Industrie Service GmbH
1. Executive Summary

This Mission Report was prepared within Twinning Project TR 13 IPA NS 01 16 R, entitled “Improvement of the Nuclear Safety Regulatory Infrastructure of Turkey”.

The third workshop under Activity 4.2 “Workshops” of Component 4 “Human Resources Management” was carried out. The conducted workshop was titled “Factory Acceptance Tests of a pump at the Premises of Layne Bowler Pompa Sanayi A.S.”.

The present mission supplements on the one hand the activities and results of the Activity 4.1 “Development of a tailored TAEK/DNS Human Resource Management System Manual” and on the other hand the activities and results of the Activity 3.1 “Review of existing Turkish regulatory inspection documents and developing new procedural manual and guidelines on inspection”.

During a three-day-workshop all TAEK-experts and experts from other Turkish stakeholders of the newly developed Turkish Nuclear Environment were invited. More than 25 participants took part in the workshop. The workshop comprised a theoretical part at the premises of TAEK and a practical part at the premises of Layne Bowler Pompa Sanayi A.S.

2. Team Members

The Mission was carried out by:

- [Name], TÜV SÜD Industrie Service GmbH

Participants of the Workshop:

The list of participants is attached to this mission report as annex 1.
3. Mission Results

The schedule of the workshop was as follows:

<table>
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<th>Table of contents</th>
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<tr>
<td><strong>Day 1</strong> Basics of centrifugal pumps</td>
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<td>(1) Centrifugal pumps – displacement pumps: Similarities and differences</td>
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<td>(2) Types and classifications of centrifugal pumps</td>
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<td>(3) Basics of calculations</td>
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<td>(4) Suction capabilities</td>
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<td>(5) The four most important characteristic curves</td>
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<td>(6) Characteristic curves of pipe systems</td>
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<td>(7) Flow regulation</td>
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ISO 9908: Rotodynamic pumps — Hydraulic Performance Acceptance Test

(8) Scope and purpose |
(9) Test rig arrangements for radial and axial pumps |
(10) Arrangement of measurement devices |
(11) Test procedure / proof of guarantee |
(12) Evaluation of test results / conversion of measurement conditions to guarantee conditions |
(13) Test report

**Day 2** Practical pump acceptance test for a single stage centrifugal pump

(1) Head – Flow |
(2) Driving power – flow |
(3) Efficiency – flow |
(4) NPSHr – flow (suction capability) |
(5) Measurement data => curves |
(6) Inspection report

**Day 3**Debriefing / Discussion / Questions / Conclusions

(1) Questions and answers |
(2) Exercises |
(3) Miscellaneous

Following pictures show the testing facilities and the equipment under test (pump) at Layne Bowler:
LayneBowler

TEST STAND
The following test report was created during the practical testing at Layne Bowler’s test rig:
The presentations that were held during the workshop are attached to this mission report as annex 2.

4. Conclusion

Workshop 3 titled “Factory Acceptance Tests of a pump at the Premises of Layne Bowler Pompa Sanayi A.S.” under Activity 4.2 was conducted as planned in Operative Side Letter No. 5.

thanks TAEK, Layne Bowler Pompa Sanayi A.S. and the Turkish counterparts for the excellent organization, their great cooperation and transparency as well as their hospitality throughout the workshop 3 of Activity 4.2.

Annexes

Annex 1: List of participants
Annex 2: Presentation
Annex 3: Exercises (questions and answers)