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# Report on the implementation of the LLL program "Industrial Pneumoautomatics and mechatronics. The main level" in InEU

## PERIOD OF ACTIVITY 19/07/2022-22/07/2022

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|---|---|
| Abbreviated name of the project: | DIARKAZ |
| Full name | Dual education in industrial automation and robotics in Kazakhstan |
| of the project: | 609757-EPP-1-2019-1-RS-EPPKA2-CBHE-JP |
| Project No.: | ERASMUS+ |
| System | 15/ 01/ 2020 |
| Project start date: | 36 month |

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| Annotation | This is a narrative report on the implementation of the INEU Program L for active professionals in the field of industrial automation and robotics in the period from July 19 to 22, 2022, which also includes the results of feedback after training. |

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| Document Name: | Report on the implementation of the LLL program "Industrial Pneumoautomatics and mechatronics. The main level" in InEU |
| Work Package: | WP 3: Implementation of the program |
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| | Consortium |

HISTORY OF VERSIONING AND CONTRIBUTIONS

| Version | Date | Editorial Description | Responsible Partner |
|---|---|---|---|
| 1.0 | 22/07/2022 | The first edition | InEU |

WARNING

The European Commission's support for the preparation of this publication does not imply approval of the content that reflects the views of the authors only, and the Commission cannot be held responsible for any use of the information contained therein.

Activity Report

Within the framework of the Erasmus+ 609657-EEP-1-RS-EPPKA2-CBHE-JP project "Dual education for industrial automation and robotics in Kazakhstan/ DIARKAZ" in the period from July 19 to 22, 2022 at the Innovative Eurasian University @ineuofpage (Pavlodar), an extended training course for automated control system engineers was conducted. enterprises of the Pavlodar region.

- JSC "Aluminum of Kazakhstan"
- Mine "Keregetas"
- JSC "Kazakhstan Electrolysis Plant"
- "Company Neftekhim LTD" LLP
- JSC "SUT Pavlodar"

Table 1. Content of the LLL program

| № | Content of the discipline (topic or section) Number of hours | Total including | | |
|---|---|---|---|---|
| | | Total including | Lecture Practice | |
| | | | Lecture | Practice |
| **1 module** | | | | |
| 1 | Compressed air system and compressor equipment, compressed air quality | 1 | 1 | |
| 2 | Compressed air network device, prevention of loss and leakage of compressed air | 1 | 1 | |
| 3 | Installation and operation of measuring instruments in the compressed air network | 2 | 1 | 1 |
| 4 | Basic concepts of pneumatics and electrical engineering, parameters and units of measurement | 2 | | 2 |
| 5 | Structure of pneumatic and electropneumatic system, DIN ISO 1219 | 2 | | 2 |
| **2 module** | | | | |

| | | | | |
|---|---|---|---|---|
| 1 | Designs and operating principle of the main pneumatic and electropneumatic devices: actuators, distributors, sensors, logic elements, compressed air preparation devices, fittings, hoses and pipelines | 2 | 1 | 1 |
| 2 | Methods of adjusting the speed of load movement in pneumatic systems | 2 | | 2 |
| 3 | Movement, time and pressure control<br>The sequence of operations in pneumatic systems with multiple actuators and the types of their formalized representation | 2 | | 2 |
| **3 module** | | | | |
| 1 | Electrical devices (electromagnets, switches, relays and sensors) | 2 | 2 | |

| | | | | |
|---|---|---|---|---|
| 2 | Basic pneumatic and relay control circuits | 4 | 1 | 3 |
| 3 | Installation and commissioning of pneumatic and electropneumatic systems | 4 | 1 | 3 |
| 4 | Installation and commissioning of pneumatic and electropneumatic systems | 2 | | 2 |
| 5 | Classification of malfunctions, their localization and elimination | 2 | 1 | 1 |
| 6 | Classification of malfunctions, their localization and elimination | 4 | 1 | 3 |
| 7 | Practical exercises: circuit development, assembly, debugging and testing on training stands | 4 | 1 | 3 |
| **Всего** | | **36** | **11** | **25** |

The list of trained specialists is presented in Table 2.

Table 2. The list of students of the LLL program.

| № | Last Name First Name Middle name | Organization |
|---|---|---|
| 1 | Knutov Alexey Nikolaevich | JSC "SUT" |
| 2 | Karpov Andrey Nikolaevich | JSC "KEZ" |
| 3 | Artykbayev Rustam Danilovich | JSC "KEZ" |

| | | |
|---|---|---|
| 4 | Secretary Nikita Sergeevich | JSC "KEZ" |
| 5 | Koshkeev Zhenys Asylbekovich | JSC "KEZ" |
| 6 | Zhumatov Yerkanat Nursainovich | JSC "KEZ" |
| 7 | Belogrivy Nikolay Yurievich | JSC "AK" |
| 8 | Abilov Sh.S. | JSC "AK" |
| 9 | Rymbai A.N. | JSC "AK" |
| 10 | Luzik Evgeny | JSC "AK" |
| 11 | Bakelov Baurzhan Abdrakhimovich | JSC "AK" |
| 12 | Akhmetov Alisher Ryskalievich | Neftekhim LTD LLP |
| 13 | Shchetkin Roman | Neftekhim LTD LLP |
| 14 | Nikita Klimov | Neftekhim LTD LLP |
| 15 | Nadtochikh Vitaly Gennadievich | Neftekhim LTD LLP |
| 16 | Vasiliev Vasily Olegovich | Senior lecturer of the Automated Control System Department |
| 17 | Bikey Dauletbek | Neftekhim LTD LLP |
| 18 | Adilov Alikhan Bauyrzhanovich | Neftekhim LTD LLP |

The training combined theoretical classes with a variety of practical work, during which technologies for the development of pneumatic automation systems, electropneumatics, including specific tasks directly facing the cadets, were studied.
Many key aspects of using the TIA Portal programming environment have been studied and tested in training projects.
The staff of the specialists who arrived at the training courses were programmers, engineers of automated control systems and instrumentation, as well as leading specialists of organizations engaged in the development of automation systems of various classes.


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