

*Federal State Autonomous Educational Institution of Higher Education "Peoples'
Friendship University of Russia"*

Academy of Engineering

PRACTICE WORK PROGRAM

Type of practice: Production

Type (name) of practice: Technological

Study program: 21.04.01 Oil and Gas Engineering - Oil and gas production and transportation technologies

Moscow,
2020

The work program of the practice was developed in accordance with the academic plan of the study program 21.04.01 Oil and Gas Engineering - Oil and gas production and transportation technologies, set in 2020, approved at a meeting of the Academic Council of the Engineering Academy May 20th, 2020 (protocol №. 10).

The work program of the technological practice was considered at a meeting of the Department of Mineral Development and Oil and Gas Engineering April 29, 2020 (protocol No. 2022-03-04/6).

Developer:

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1. The purpose and objectives of the practice

The technological practice is a production practice and is aimed at consolidating theoretical knowledge gained during the training process, acquiring practical skills and building professional competencies at the operational and tactical level of development of knowledge, skills, and skills of future specialists.

The main objectives of the technological practice are:

- consolidation and development of theoretical knowledge obtained in the study of basic disciplines;
- development and accumulation of special skills, study and participation in the development of organizational, methodological and regulatory documents for the implementation of research work;
- familiarization with the content of the main works and studies carried out in the research team at the place of practice;
- taking part in the implementation of specific research work;
- conducting applied research on the problems of the oil and gas industry, assessing the possible use of the achievements of scientific and technological progress in the oil and gas industry;
- development and justification of technical, technological, technical, economic, socio-psychological and other necessary indicators characterizing technological processes, objects, systems, projects, oil and gas organizations;
- development of physical, mathematical and computer models of the studied processes, phenomena and objects related to the professional sphere;
- improving and developing methods for analyzing information on technological processes in the pipeline transport of hydrocarbons;
- creation of new and improvement of modeling techniques and calculations necessary for the design of technological processes and technical devices in the industry;
- improvement and development of new methods for experimental studies of the physical processes of oil and gas production and technical devices;
- collection, processing, analysis and systematization of scientific and technical information on the research topic, the choice of methods and means of solving the problem;
- the implementation of the preparation of scientific and technical reports, reviews, publications based on the results of research;
- development of models of design solutions for quality management in the oil and gas industry;
- Development of systems for ensuring industrial and environmental safety of facilities, equipment and technologies for oil and gas production.
- direct participation in the workflow of the research team with the fulfillment of the duties of the researcher;
- collection of materials for the preparation and writing of a master's thesis.

2. Place of practice in the structure of the educational program of higher education

The technological practice is related to the variable component of mandatory courses of Block 2 of the curriculum. Its passage is based on the material of previous disciplines and / or practices, and it is also the basis for the study of subsequent disciplines and / or practices of the study program, a list of which is presented in table 1.

Table 1 - List of previous and subsequent disciplines / practices

| № п/ п | Previous disciplines / practices | Subsequent Disciplines |
|-----------------------|--|-------------------------------|
| 1 | Technology and technology of water-gas impact on the reservoir | |
| 2 | Volumetric pumps for the extraction of viscous oil | Pre-graduation practice |
| 3 | Simultaneously-separate well operation | State final certification |

3. Methods of the practice

The methods of conducting the Practice for obtaining professional skills and experience of professional activity are as follows:

- stationary;
- on field.

4. Volume of practice and types of educational work

Table 1 - Volume of practice and types of educational work

| Type of study | Total, ac. hours | Semester |
|--|------------------|-----------------------|
| | | 4 |
| The student's contact work with the supervisor, including monitoring | 22 | 22 |
| Other forms of academic work, including keeping a practice diary and preparing a report for students | 86 | 86 |
| Type of certification test | | Passed the assessment |
| Total labor input | academic hours | 108 |
| | credits | 3 |
| Duration of practice | weeks | 2 |

5. Place of the practice

The place of the practice is provided to the student by the supervisor of practice on the basis of concluded relevant agreements with basic organizations.

The bases for students to complete the Practice of obtaining professional skills and professional experience are:

- laboratories of the department;
- OJSC Transneft;
- LLC research institute Transneft;
- research, design and development institutions and firms.

A student can himself take the initiative on the place of practical training. The direction of the professional activity of the organization offered by students for practical training should correspond to the profile of the educational program and the types of professional activity for which the graduate of the program is preparing. The place of internship must be agreed with the supervisor of the department / department with the subsequent (if positive) conclusion of the relevant agreement with the proposed student organization. Dates and specifically and specifically the quantitative, roll-call structure of students is agreed upon additionally, no later than a month before the start of practice.

Students with disabilities and / or belonging to the category «disabled person» undergo internships in an accessible form for them in the laboratories of the university, as well as in specialized organizations with which relevant agreements are concluded and which have the opportunity (equipment, special facilities and infrastructure) work with these categories of citizens.

6. The list of planned results of practice, correlated with the results of the planned development of the educational program

The practice of obtaining professional skills and professional experience is aimed at developing the following competencies in students:

- ability to solve production and / or research problems, based on fundamental knowledge in the oil and gas field (GPC-1);
- ability to carry out the design of technological processes, objects in the oil and gas industry using computer technology (GPC-2);
- ability to develop scientific, technical, design and service documentation, prepare scientific and technical reports, reviews, publications based on the results of research (GPC-3);
- ability to plan and conduct analytical, simulation and experimental studies, critically evaluate data and draw conclusions (PC-1);
- ability to analyze and summarize data on the operation of technological equipment, to monitor, technical support and management of technological processes in the oil and gas industry (PC-2);
- ability to provide safe and efficient operation and operation of technological equipment of the oil and gas industry (PC-3).

The result of the internship is the knowledge, skills, and experience of professional activity that characterize the stages of formation of competencies and ensure the achievement of the planned results of the development of the educational program, presented in table 3.

Table 3 - the results of training in the discipline, correlated with the planned results of mastering the educational program of higher education

| Competency | Knowledge | Abilities | Skills |
|--|---|---|---|
| 1 | 2 | 3 | 4 |
| ability to solve production and / or research problems, based on fundamental knowledge in the oil and gas field (GPC-1) | - fundamental knowledge of professional activities for solving specific problems of oil and gas production, | - analyze the reasons for the decline in the quality of technological processes and offers effective ways to improve the quality of work when performing various technological operations | - skills in physical and software modeling of individual fragments of the process of choosing the best option for specific conditions |
| ability to carry out the design of technological processes, facilities in the oil and gas industry using computer technology (GPC-2) | - an algorithm for organizing the execution of work in the process of designing oil and | - to formulate the goals of the work and offers ways to achieve them. | - skills in collecting baseline data for the preparation of a technical project for the design of a technological process, an object; - skills of |

| | | | |
|---|---|---|--|
| | gas industry facilities. | | computer-aided design of technological processes. |
| ability to develop scientific, technical, design and service documentation, prepare scientific and technical reports, reviews, publications based on the results of studies (GPC-3) | - methodological and regulatory materials used in the design and preparation of scientific and technical documentation. | - develop scientific and technical, design, service documentation, draw up scientific and technical reports, reviews, publications based on the results of research. | - skills in the development of normative and methodological materials and their inclusion in the production process. |
| ability to plan and conduct analytical, simulation and experimental studies, critically evaluate data and draw conclusions (PC-1) | - modern developments in the field of analytical, simulation, experimental research, computerized systems (including mathematical modeling programs, digital information processing, three-dimensional visualization of the results). | - perform analytical research; - perform simulation studies; - perform experimental research; - correctly interpret the results. | - introduction of modern developments in the field of analytical, simulation, experimental research, computerized systems in various directions of pipeline transport and evaluate the potential implementation effectiveness. |
| ability to analyze and summarize data on the operation of technological equipment, monitor, technical support and process control in the oil and gas industry (PC-2) | - analyzes and determines the advantages and disadvantages of the used technological equipment in the Russian Federation and abroad. | - determines on a professional level the features of the work of various types of technological units used in the oil and gas industry. | - has the skills to interpret the data on the operation of equipment, technical devices in the oil and gas industry. |
| ability to ensure safe and efficient operation and operation of technological equipment of the oil and gas industry (PC-3) | - knows the rules for the operation of technological equipment, structures, objects, machines, mechanisms of oil and gas production. | - complies with the requirements of regulatory documentation for the operation and maintenance of technological equipment, structures, objects, machines, mechanisms of oil and gas production. | - has the skills of efficient operation of technological equipment, structures, objects, machines, mechanisms of oil and gas production. |

7. The structure and content of the practice

| № | Practice steps | Types of work carried out by students | Academic work on forms, ac. hours | | Total, ac. hours |
|---|----------------------------|---|-----------------------------------|------------------------------|------------------|
| | | | Contact work | Other forms of academic work | |
| 1 | Organizational preparatory | Receiving an individual task from the supervisor | 2 | - | 2 |
| 2 | | Safety training at the workplace (in the laboratory and / or in the workplace) | 2 | - | 2 |
| 3 | Main | Performing professional duties according to the job description | - | 33 | 33 |
| 4 | | Concept development, formulation of problems and hypotheses, formulation of basic theoretical principles for the practical part of the work | - | 33 | 33 |
| 5 | | Ongoing monitoring of internship by the leader | 10 | - | 10 |
| 6 | | Keeping a practice diary | - | 10 | 10 |
| 7 | Reporting | Preparation of a practice report | - | 10 | 10 |
| 8 | | Intermediate certification (preparation for defense and report protection) | 8 | - | 10 |
| | | TOTAL: | 22 | 86 | 108 |

For students from among persons with disabilities and / or belonging to the category of «disabled person», if necessary, the head of practice develops individual tasks, a plan and an internship taking into account the characteristics of their psychophysical development, individual capabilities and state of health, educational program adapted for these students (if any) and in accordance with individual rehabilitation programs for the disabled..

8. Educational, research and development technologies used in practice

During the practice, the following educational technologies are used:

- contact work of the student with the teacher, which consists in receiving an individual assignment, undergoing safety training, receiving advice on practical training, filling out current and reporting documentation, as well as protecting the practice report;

- other forms of educational work (educational activity), which include the main activity of the student in the implementation of sections of practice in accordance with an individual task, recommended methods and sources of literature, aimed at the formation of certain professional skills or professional experience provided for program of practice, as well as the completion of current and reporting documentation, and preparation for the defense of the report on the passage of practice.

During the internship, the following scientific studies and scientific production technology:

- mastering by students of methods of information analysis and interpretation of the results of research activities;

- performance of written analytical and calculation tasks in the framework of practice using recommended information sources;

- the use of various computer software products for graphic, analytical and / or industrial purposes (depending on the place of practical training and the specifics of the assignment);
- use by students of various electronic library and reference legal systems, etc.

9. Educational-methodical and informational support of educational practice

Main literature:

1. Takacs Gabor, Electrical Submersible Pumps Manual // Gardners Books, 2014.
<http://dx.doi.org/10.1039/978187552274-00828>
2. Manring Noah D, Fluid Power Pumps and Motors: Analysis, Design and Control // Gardners Books, 2014.
<http://www.aupress.ca/index.php/books/120162>

Additional literature:

1. Hucknall D. J., Morris A. Pumps and pumping systems // Vacuum Technology Calculations in Chemistry. 2003
<http://dx.doi.org/10.1039/9781847552273-00056>
2. E. Shashi Menon, Pipeline Planning and Construction Field Manual // SYSTEK Technologies, Inc., 2011.
<http://www.aupress.ca/index.php/books/12062>

Periodicals:

1. Magazine «Oil and Gas Journal» <https://www.ogj.com/>
2. Energy and Fuels <https://pubs.acs.org/page/enfuem/editors.html>
3. International Journal of Oil, Gas and Coal Technology
<https://www.inderscience.com/jhome.php?jcode=ijogct>

Resources of the information and telecommunication network «Internet»:

1. RUDN University ELN and third-party ELN, to which university students have access based on concluded agreements:
 - The electronic library system of RUDN University - ELN RUDN University
<http://lib.rudn.ru/MegaPro/Web>
 - ELN «University Online Library» <http://www.biblioclub.ru>
 - ELN Yurait <http://www.biblio-online.ru>
 - ELN «Student Consultant» www.studentlibrary.ru
 - ELN «Lanbook» <http://e.lanbook.com/>
2. Databases and Search Engines:
 - electronic fund of legal and regulatory technical documentation <http://docs.cntd.ru/>
 - Yandex search engine <https://www.yandex.ru/>
 - search engine Google <https://www.google.ru/>
 - abstract database SCOPUS <http://www.elsevierscience.ru/products/scopus/>

Software:

- License for Software «ARMARIS» for ESP.
- Software «Emergency simulator PISCES II» (Version 2.93) WF 60.2013 Transas Ltd

- Specialized software «TransasShelf 6000 DrillingSimulator»

Methodological materials for practical training, conducting current and preparation of accounting documentation for students:

1. Guidelines for internship, maintaining current and preparing reporting documentation for students in the direction 21.04.01 Oil and Gas Engineering - Oil and gas production and transportation technologies (Appendix 2).

10. Logistical support of educational practice

| | |
|---|--|
| Podolskoe shosse, 8, building 5 Classroom: №360 | Set of specialized furniture; chalk board; hardware: projection screen; SANYO plc xt20 multimedia projector; system unit DEPO Neos 220 |
| Podolskoe shosse, 8, building 5 Mining machinery laboratory № 358 | Computer with pre-installed licensed software "ARMARIS" Intel Soge15 processor; "Wellhead fittings" - mock-up stand; 3D LED TV on a rack with a screen diagonal of 32 inches; The breadboard model - the Electron-09 1 controller from the Electron 05-250 SU in a compact design |
| Podolskoe shosse, 8, building 5 Laboratory of rational subsoil use № 337 | Set of specialized furniture; hardware: Acer V193L monitor, RAMEC STORM W system unit, keyboard, computer mouse-4; Plotter Hewlett Packard C7770B; Creative WebCam Live Motion 1 camera, NIKON LV100D microscope, AdventurerProRV214 electronic laboratory balance, AdventurerProRV313 electronic laboratory balance, Scimitar1000FT-IR IR Fourier spectrometer, PRIZMA-ECO X-ray fluorescence energy dispersive analyzer, K201-512 high-pressure reactor |
| Podolskoe shosse, 8, building 5 Mining machinery laboratory № 362 | Set of specialized furniture; Drilling simulator "Transas SHELF 6000 Drill"; Additional place for the trainee to simulator drilling simulator "Transas SHELF 6000 Drill" |
| Podolskoe shosse, 8, building 5 Laboratory of hydrodynamic processes of oil and gas production № 341 | Ejector; Work bench, instrumentation and shut-off and control valves; Tank; Stand-layout of the pump-ejector system, left view; Laser diode; Column with liquid; Air compressor; Gas supply system to the column; Gas meter; Pressure gauge; Photodiode Digital oscilloscope |

11. Certification

In the process of internship, the teacher monitors the progress of the student's assignment to practice. Based on the results of the practice, an intermediate certification is provided in the form of a set-off with an assessment (based on the results of the protection of the report on the practice).

12. Fund of assessment tools for intermediate certification of students in practice

The fund of assessment tools, formed to conduct ongoing monitoring of academic performance and intermediate certification of students in the course of research work, is presented in *Appendix 1* to the work program of practice and includes:

- a list of competencies formed in the process of internship;
- a description of indicators and criteria for assessing competencies, a description of assessment scales;
- typical control tasks or other materials necessary for assessing knowledge, skills, and (or) experience that characterize the level of formation of the competencies;
- methodological materials that determine the procedures for assessing knowledge, abilities, skills and (or) experience, characterizing the level of formation of competencies.