

**Self-evaluation Report
About completing a short-term research visit to**

International Academy of Management and Technology (INTAMT).

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SFU

Institute of Non-Ferrous Metals and Materials

1. Hosting country: The Federal Republic of Germany
2. City: Dusseldorf
3. Dates of staying from 06.05.2013 till 27.06.2013
4. Visit details:

The organizer of the program - the International Academy of Management and Technology (INTAMT)

Aims of visit: European research on best practices in the field of metallurgy and metal forming under pressure

Goals of visit:

- improve the scientific and educational level;
- material collection, consulting with leading university teachers on the subject of research for writing a master's dissertation;
- familiarity with the advanced technology of metallurgical production at enterprises;
- Obtaining of practical skills with the equipment, computer programs.

5. Initial plan of visit:

- education in departments and laboratories of leading universities, familiarity with advanced technologies for metallurgical and engineering enterprises of Germany.

- learning new computer programs, methods of operations research metal forming equipment for studying the structure and properties of metals and alloys for writing a master's dissertation.

6. Results of visit

6.1. In the course internship the following modules have been studied.

The module №1: «Computer-aided design tools and tooling for metal forming processes. Software for 3D – modeling in Dusseldorf University of Applied Sciences».

The module №2: «The organization, methods and programs of specialists under the Metal Forming at the University of Duisburg-Essen».

The module №3: Combined treatments of nonferrous metals and alloys at the University of Aachen.

The module №4: «Innovative methods of metal forming at the University of Aachen».

The module №5: «Familiarization with the rolled and pressing-drawing production at the metallurgical plant of Duisburg».

The module №6: «Familiarization with production company SMS MEER, specializing in the manufacture of equipment for metal forming.

The module №7: «The organization, methods and programs in specialties Technology of jewelry» and Technology of artistic metalworking. Familiarization with production jewelry. Professional College of Essen».

The module №8: «Introduction to the exhibition expositions jewelry in museums and exhibitions of various cities in Germany».

6.2. A search and analysis of scientific literature to write a master's dissertation.

6.3. Taken part in projects of research work carried out by masters and doctors of the Technical University of Clausthal.

7. Evaluation of the visit efficiency

International Academy of Management and Technology (INTAMT) - developer and organizer of internship program from Germany. At the Academy INTAMT, apart from German workers, highly skilled professionals with significant luggage vigorous activity in the CIS countries and the European Union, allowing the Academy to successfully implement communication between specialists from different countries.

The internship program is almost fully consistent with the instructions issued and held in the highest degree of efficiency..

Düsseldorf University of Applied Sciences (Fachhochschule Duesseldorf)

The university is one of the biggest in the German federal state of North Rhine-Westphalia and offers training in integrated and interdisciplinary courses. Particular attention is paid to: engineering, process design, media, social and cultural sciences and business studies. The university has about 80 European and 30 international agreements and actively promotes the international exchange of students and teachers.

It was performed a specific task on the modeling and design of the stress-strain state of the metal sample subjected to tensile loading on different paths.

University of Duisburg-Essen

Included in the University Alliance UAMR (Bochum, Dortmund, Duisburg-Essen). Specialized areas include research in the field of nanotechnology, genetics, and medical biotechnology, and research in the field of education. The University includes Institute of Metallurgy and Metal Forming, which was held internships.

Wieland Group

Wieland Group includes a variety of branches and representative offices around the world. The company specializes in the production of copper alloys, mostly bronze, brass and uses processes such as casting, hot and cold rolling of strip, sheet-metal stamping, pressing, etc. The main type of production - semi-finished and finished products the electrical industry, as well as the bearings.

During familiarization with the equipment and technology of plate rolling considered such technological and scientific aspects as: types of equipment used for rolling, heat treatment is, roll tool design features, the composition of grease used, the simulation of the rolling process on a computer, etc.

The Rhenish-Westphalian Technical University of Aachen

Higher educational institution in Aachen, Germany. RWTH technical university is a TOR 9 (Association of the nine best technical universities in Germany), IDEA League (Association of the top five universities in Europe), and the Association of Top Industrial Managers for Europe. RWTH technical university has 10 faculties and 260 departments (410 professors).

В университете наиболее полно представлены лаборатории по обработке металлов давлением. При этом было проведено ознакомление с таким оборудованием лабораторий, как раскатной стан для получения бандажей из сталей; комплекс прокатного оборудования, оснащенный тензометрической, измерительной и другой аппаратурой с отображением параметров процесса на дисплее компьютера,

Research laboratory equipment used in the processing of metals in the Rhine-Westphalian Technical University of Aachen

The laboratory is known around the world and is a leader in research and innovation in the field of production technology. In particular, the laboratory is engaged in the

calculation and production of equipment and their parts and components, metrological examination and evaluation of manufacturing systems, process monitoring and diagnostic equipment, the principles of human-machine interaction, control and automation, etc.

Technical University of Clausthal

Key areas to be studied at university - this production, processing and preservation of resources such as materials, energy and information. This is followed by work in the fields of chemistry, physics, earth sciences and applied sciences such as chemical engineering, materials technology, etc. It should be noted that up to one third of the total budget of the University, is a result of research activities. The Institute of Metallurgy conducted research on molding and metal forming. In particular, studying the processes of stamping steel parts with coatings, drawing copper pipes, sheet rolling, etc.

This practice site meets all the requirements of internship program on the study of metal forming processes.

Professional College of Essen

All departments have well-equipped laboratories and workshops. Training was conducted in the laboratories of jewelry manufacturing with the acquisition of practical skills.

Foundry Institute, Dusseldorf

Is one of the leading research and educational institutions in the world in the field of foundry technologies. This position is achieved through the implementation of three key principles: unity of research and teaching, the diversity of research topics, as well as constructive and close cooperation with partners from industry and science. The main objectives of the research institute are research projects in the field of metallurgy, crystallization, foundry materials, the casting process and applied problems of casting technology for the production of preforms used in metal forming processes.

Metallurgical plant of SMS in Monchengladbach

Division SMS Meer in Monchengladbach is the leader of metallurgical machinery for the production of long-length steel products, such as the production of equipment for pipes, rolled, non-ferrous metals and heating equipment. In its program, the production of press and forging equipment SMS Meer offers innovative production methods. SMS Meer also manufactures automated press-forging equipment. Extensive experience in the field of technology and materials accumulated over decades forms the basis for the technological

systems that control the forging equipment, and hydraulic presses, stamping presses, plate rolling and rolling mills, etc.

Metallurgical company C.D. Walzholz

Managed by a family dynasty for 150 years. The company has subsidiaries in the United States, Brazil, Germany, Switzerland, France and China. Specializes in the production of cold-rolled sheets, strips and strips of various steel grades. Production company: aerospace parts, garden tools, edging skis (company holds about 60% of the world market of the product) parts of household appliances and road transport, automotive (70% of the products manufactured by companies involved in the industry), as well as details of wind power plants. Annual output of the enterprise is 500 thousand tons, is planned to produce 800 thousand tons in 2020.

Were familiarized with the technology of production of steel sheets, which are made from various grades of steel. A demonstration of the mill Quarto, equipped with two winders, rolling sheet material with a thickness of 1 mm. Held visiting lines cutting and packaging of finished products as well as automated warehouse storage products.

University of Applied Sciences in Krefeld

The university is one of the largest universities of applied sciences in Germany, has a good national and international reputation. It has about 10,500 students, and the proportion of foreign students coming to the university from more than 90 countries, accounting for 16%. The University consists of 10 deans, which are located in two campuses in Krefeld and Monchengladbach. During the internship were shown the possibility of using for metal forming processes several computer programs, demonstrate the operation of a 3-D printer and a unique milling machine equipped with a robot with five degrees of freedom. In particular, it was gleaned that a computer-controlled machine can be used for the manufacture of tools used for metal forming.

University of Siegen.

University of Siegen consistent with the concept of the modern institution of higher education: it provides a high level of education, contributes to the fundamental and applied research and is a center of creative development and training of qualified personnel. The university is a lot of institutions, one of which Institute of Technology modeling and scientific computing engaged in the development of algorithms and methods for the use of

large parallel systems for the simulation. The objective is to cover a wide range of applications simulation enforce them to massively parallel systems.

8. Percentage of completing the initial plan of visit

The original plan of internships is made in full. Also visit was organized to further metallurgical plant of SMS.

9. How much the visit contributed to your future professional/research activities?

During the internship the results of learning new computer programs were developed computer models of the hot extrusion process, written two sections of master's dissertation.

10. List of documents confirming your successful completion of the research visit.

According to the results of internships received a certificate of participation in the seminar «Study of the best European practices in the field of metallurgy and metal forming», a copy of which is attached.

11. Overall evaluation of the visit

11.1. Internship allowed to meet with new technologies, equipment, tools and software equipment for metal forming.

11.2. Obtained skills laboratory equipment for metal forming and acquired experience with computer programs ANSYS and LS-DYNA.

11.3. We studied the system of organization of education in Germany, in particular, in teaching students in the steel profile.

11.4. Were established personal contacts with experts in the field of metal forming.

12. What changes would you have made if you were preparing for the next visit of a similar kind?

In preparation for the internship would be necessary to conduct a more detailed preliminary study of each of the visited organizations and attempt to establish preliminary contacts with experts in the correct profile.

Date of report

Signature