Professional Education Competence Centre
Riga Technical College

First Level of Higher Professional Education

HEAT POWER ENGINEERING

Study Program Self-evaluation Statement

Riga Technical College Power Engineering Department
Study program director: assist. prof. V.Grišins

Riga

2011

Satura rādītājs

INTRODUCTION

The study program at Professional Education Competence Centre Riga Technical College (hereafter RTC) submitted for the evaluation is the first level of higher professional education study program in *Heat Power Engineering* with the aquired qualification *heat power engineering specialist*. The study program was accredited on 4 November 2009, with the act of the Accreditation Committee No 035-1745until 31 December, 2015.

1.Quality

1.1.Study Program Aims and Tasks

The study programm **is aimed at** providing higher professional education and preparing highly-qualified specialists for a successful career in the domain of heat power engineering working with various heat power engineering systems and appliances in accordance with the design of the technological process, comprehension and awareness.

The main tasks of the specialists are related to the maintenance and installation of heat power engineering systems, work process organisation and management, energy saving, environmental protection as well as the project management of simple heat power supply projects.

1.2. Study Content and Organisation

In order to ensure achieving the aims of the study program it involves:

- 20 credit points (hereafter CP) of general education study courses (including 1 term paper),
- 55 CP of domain specific study courses (including 3 term papers),
- 16 CP of internship,
- 9 CP granted for the design and the defense of the qualification paper

The study program consists of 100 CP with the implementation period being two and a half years for full-time studies and three years for part-time studies.

The teaching methodology and study modes which are selected and applied during the program implementation are aimed at continuous and consistent learning and connecting the previously acquired knowledge and skills with the subsequent ones. As the levels of students' knowledge, skills and perception are different, various teaching methods are implemented, the relevance of which is checked after the acquisition of a definite theme in accordance with the study course programs. Interactive study methods are applied using which academic personnel formulate the aim and objectives, recommend reference literature sources, and the appropriate ways of information processing, which students can achieve autonomously applying their own techniques and at their own pace. Whenever possible, audio-visual mode to present the study material is widely used.

Students' wishes and interests are considered selecting the themes for course projects presented and defended during the seminars. They are topical for them and match with the course content. Thus, designing course reports and term papers the students learn to acquire the material

autonomously and develop the skills for further qualification paper design and defense. The improvement in this field has been noted by the State Qualification Examination Committee.

Term papers (projects) are expected to be designed in the following courses: Technical Thermodynamics and Heat Transfer, Heating Supply, Fuel, Furnace, Boilers, and the general study course Entrepreneurial Economics. The aim of the term paper design is to strengthen the theoretical knowledge, acquire research, empirical and creative skills as well as evaluate students knowledge and skills in the certain subject. The term paper must attempt to solve specific problems under the supervision of the academic advisor. The theme of the term paper is appointed by the academic personnel.However, the students are offered to choose the themes of course reports and term papers that correspond to the course content, contain topical problems and novelty with further defense in the format of a presentation themselves with the consequent approval by the academic advisor. Thus, the students are facilitated to learn autonomously the information that is appealing and topical for them as well as present their research activities. The possibility is very actual since many students combine their studies with work at leading Latvian enterprises. The term paper is defended and evaluated according to the 10 points system.

The students are required to strengthen the theoretical knowledge and prove its application, which justifies the involvement of two internships in Latvian enterprises, i.e.

Production technological internship of 5 CP (5 weeks) in the 4^{th} semester;

Qualification internship of 11 CP (11 weeks) in the 5^{th} semester.

Production-technological and qualification internships are organized at the leading enterprises of the domain, e.g. *JSC Latvenergo, JSC LAFIPA, Rīgas Siltums Ltd, GREIN Ltd*, as well as at regional heat power network enterprises. The internship is supervised by the college academic personnel, who together with the prospective qualification paper advisor gives individual assignments, provides tutorials and controls the overall process. Thus, the actual data collection and the design of the qualification start during the internship. Every student also has the head of the internship from company employees at the workplace. At the end of the internship the student submits an internship log, a report and a reference from the head of the internship at the workplace to the department. The execution of the internship program is evaluated by the head of the internship from the academic personnel considering the reference from the employer and prospective qualification paper advisor. The assessment is *passed* or *failed.*

Upon successful completion of the theoretical and practical studies as well as internship assignments, the student is required to defend the qualification paper in accordance with the *Methodological Guidelines and Conventions for Qualification Paper Design at Riga Technical*

College, which were designed in 2008, supplemented in 2011 and are accessible at RTC webpage (www.rtk.lv). The students are allowed to select the theme of the qualification paper themeselves with further approval.

The sequence of the development of the qualification paper is as follows:

- formulating the task;
- analysing the problem and choosing a possible solution;
- practical implementation of the task applying efficient solution technologies;
- assessment of the acquired results.

The design and defense of the qualification paper demonstrate the compliance of a student's theoretical knowledge and practical skills with the qualification requirements.

The students are provided with an individual approach throughout implementation of the study program:

- The students are offered to choose the themes of course reports and term papers that correspond to the course content, contain topical problems and novelty with further defense in the format of a presentation themselves with the consequent approval by the academic advisor. Thus, the students are facilitated to learn the information that is appealing and topical for them autonomously as well as present their research activities and acquire the skills necessary for further qualification paper defense.The possibility is very actual since many students combine their studies within leading Latvian enterprises.
- During their internship the students complete an individual assignment. After that they submit an internship log, an assignment report and a reference from the head of the internship at the workplace to the department.
- A theme for the qualification paper can be chosen by the students.

Term papers, the internship report as well as the qualification paper design and defense are conducted by students individually under the supervisor's guidance, which ensures an individual approach and feedback.

The overall aim of the internship is to strengthen and supplement knowledge and skills acquired during the study courses as well as prepare the students for the qualitative design of the qualification paper. The aims and objectives of the internship are the following:

1. Production-technological Internship

Aims:

- to acquire practical knowledge and skills within the chosen profession;

- to choose a preliminary topic of the qualification paper topic and the academic advisor.

Objectives:

- to get familiarized with the structure of the heat power supply appliances of the company;
- to acquire heat power engineering technological processes and their organization at a workplace;
- to get acquainted with the design of a boiler house, the principles of its operation and exploitation;
- to choose a preliminary topic of the qualification paper topic and the academic advisor.
- to gather the materials required for the internship report and design it.

2. Qualification Internship.

Aims:

- to supplement practical knowledge and skills within the chosen profession;
- to specify the theme of the qualification paper and, consulting the academic advisor, design the objectives of the qualification paper;
- to become familiarised with the future potential workplace after the graduation from college.

Objectives:

- to get acquainted with the problem solving processes within a heat power supply company;
- to specify the theme of the qualification paper;
- to clarify the problems solved in the qualification paper;
- to conduct practical assignments in accordance with the business profile of the enterprise;
- to describe the technology applied for solving a practical assignment;
- to solve the problems and the tasks of the qualification paper considering the advisor's guidelines.

Production-technological and qualification internships are organized at the leading enterprises in the relevant domain, e.g. *JSC Latvenergo, JSC LAFIPA, Rīgas Siltums Ltd, GREIN Ltd* as well as at regional heat power network enterprises. The content of the study program is

aimed at meeting the needs of these employers. Thus, the theoretical part corresponds to the practical needs and demand of the labour market.

In order to ensure the successful completion of all study courses of the 1st level of higher professional education program assessment system, assessment criteria and requirements have been designed. Assessment techniques are different depending on the content and the aims of the study course and can be seen in course descriptions of the program.

In order to assess the students' progress during the acquisition of the course content and upon course completion, the academic personnel applies B. Bloom's taxonomy according to which:

1. Knowledge – remember, recognise, define
2. Comprehension – explain, interrelate
3. Application – generalise, organise,
4. Analysis – compare, differentiate, classify,
5. Synthesis – compose, construct, produce,
6. Evaluation – judge, weight, summarise.

At the beginning of the study course the students are informed about the assessment of their knowledge and skills. The information obtained stimulates students' learning motivation, develops their self-assessment skills and allows teachers to assess learning process in groups.

Implementation and improvement of the didactic concepts is ensured by pedagogical education of the academic staff which has been additionally acquired.

Once a month the department meetings are held, where one of the most essential discussed issues is students' successful performance, their attendance of lectures, as well as the evaluation of the session results. The results of the academic year are evaluated taking into consideration and approving of the annual self-assessment statement of the study program.

1.3 Studies and Evaluation of Knowledge

When developing a course program, its integral parts are clearly set goals of the course, tasks and assessment criteria. Thus, upon commencement of a study course the students are familiarised with the course content, expected learning outcomes upon the successful course completion as well as the requirements for obtaining credit points and assessment criteria. The above mentioned factors facilitate further collaboration between the academic staff and the students as well as prevent problem occurrence.

Term papers and qualification papers presuppose a variety of solutions, which are worth comparing. Thus, the academic personnel develops students'problem solving skills.

In order to pass the courses successfully, especially beginning the studies, students' prior readiness is crucial. For students' enrollment *RTC Matriculation Procedure*, which was issued in accordance with the Law of Higher Education Institutions clauses 45, 46 and 83, is used. In recent years applicants' competition to obtain a budget subsidised place in the Heat Power program Engineering was the following: in the year 2009 – 3.7; in the year 2010 – 1.4; the year 2011 – 1.9. Having cooperated with the first year students, the following conclusion has been made, i.e. their background is satisfactory; though, it is always expected to be better.

To ensure the achievement of learning outcomes in a timely manner and the increase of students' motivation academic personnel has compulsory tutorials the times and dates are available to students electronically at RTC webpage and on the notice board next to the schedule. The information exchange is also available using individual and group e-mails. In order to ensure the achievement of results of the study program and motivate students to study, the knowledge of the students is regularly assessed with the help of tests, colloquia, seminars, practical and individual assignments completion and presentation.

1.4 Study Provision and Management

RTC regulations and structure determine the operation of RTC board, involving students' representatives delegated by RTC Students' board. Therefore, the students are included not only in the decision making concerning specific study programs, but also with regards to the decision making process at college on the whole.

Referring to the study program, an essential aspect of program implementation is annual students and graduates questionnaires, the results of which are included into annual self-assessment statements accessible at college webpage www.rtk.lv. The results of the questionnaires are analysed during the department meeting at the end of the academic year. Respondents' negative feedback is closely paid attention to in order to eliminate weaknesses However, it is worth mentioning that during the implementation of the study program *Heat Power Engineering* such instances are minimal and the students are mostly satisfied with the study program.

Rare conflict situations are solved through discussions involving the conflicting sides and the head of the department, or, in case of the necessity of finding a compromise, on the basis of a formal application and a decision of the department meeting which is confirmed by the RTC

principal's order. It is worth mentioning that during the implementation of the study program there have not been such precedents.

The introduction of the *Code of Ethics*, which was designed by lecturer Evija Tože in 2011 was reviewed in her article *The Introduction of the Code of Ethics to Academic personnel's, Employees' and Students' Work at Riga Technical College* – RTC scientific proceedings 9th issue, 2011.

1.5 Academic Personnel and Students Research (Creative) Activities

Currently there are 16 members of the academic personnel involved in the implementation of the study program *Heat Power Engineering* who have the following qualifications in the relevant fields:

- Doctor of science – 1,
- Masters – 13,
- Bachelors – 1,
- higher professional education– 1.

Since 2007 scientific research papers have been published. The academic personnel regularly takes an active part and improves their qualification in different scientific conferences, courses and other creative activities.

Since 2002 RTC has held annual *International Scientific Practical Conferences* where RTC academic personnel as well as its students participate publishing their findings and result in scientific articles, e.g. D.Turlajs, V.Grisins, S.Jaundalders. Sildvirsmas un šķidrumu mijiedarbība individuālajos vārīšanās centros. (Mutual interaction of heating and liquids in individual boiling points.) ISBN 978-9984-32-084-1, RTC scientific proceedings, 5th issue, published by RTU, Riga, 2007; forthcoming I.G. Himsayev (JSC Kazankompressormas, Russia, G.F. Ziskin (JSC V. B. Shnepp's Scientific Research Institute Turbocompressor, Kazan, Russia), N.N. Agapov, D.S. Svidkij (United Institute of Nuclear Research, V.I. Veksler and A.M. Baldin's Laboratory of High Energy Physics, Dubna, Russia), V.A. Grishin (Riga Technical College, Latvia) *Helium Screw Compressor GV 110/30 for Cryogenic System of Accelerator Complex NICA in Dubna*, journal *Refrigerating Equipment*, issue No 1, Moscow, 2012.

1.6 Quality Assurance and Guaranties

Professional Education Competence Centre *Riga Technical College* has its quality management system, which encompasses all the operating activities of an educational institution

and defines quality environment within the educational institution. The quality management system changes alongside with the changes in the environment.

Kvalitātes vadības sistēma nodrošina, ka procesi tiek plānoti, organizēti, kontrolēti un koriģēti. It ensures process planning, organisation, control and correction.

The following aspects are of high significance:

- the efficient evaluation of the existing achievements, the analysis of the correlation in self-organized and- self-managed activities;
- the calculation of internal reserves and development potential;
- the ability to promote the most essential issues, forecast precise expected outcomes and review further activities (set development goals and tasks; select the most suitable solutions of tasks for the appropriate target audience, situation and environment);
- the ability to define the content of the required information and the procedure of data collection for further evaluation of processes.

The internal quality system of the higher professional education study program *Heat Power Engineering* has been established basing on study quality monitoring and control systems.

The internal assessment of the education institution is a possibility to evaluate its activity and outcomes. It demonstrates the preferred development ways of the higher educational institution (students, academic personnel, employees, physical study facilities) grounded on internal potential and needs.

Summarising the information about the gradutes' careers in 2009 – 2011, it can be seen that the majority continue their professional development in the chosen specialty (75% of graduates work, 42 % continue their education and development in more advanced higher education programs and work, 4,1 % only study.). 66 % of the present 3rd year students are having the qualification internship with their potential employers in accordance with the specialty. One of the internship assessment criteria to be taken into account is the reference of a particular trainee. In almost all the received references the students are highly evaluated. (If the evaluation is not satisfactory, the student's internship is not accepted).

It is considered that these figures confirm that the graduates have a broad range of career prospects to work successfully in the specialty acquired as well as that the educational aims of the program are met.

2 Resources

2.1 Study Program Aims and Tasks

In the course of the study program *Heat Power Engineering* implementation its resources have been continuously improved. With the support of *Remus Ltd* classroom 110 was renovated. *Remus Ltd* and *LEC Ltd* contributed to equipping a new computer classroom. The program implementation resources will be further improved. The students of the study programme *Heat PowerEngineering* use the technical facilities of other RTC departments, e.g. one of the most up-to-date electronics laboratories in Latvia, computer classrooms of ITC department, the *Corporate Psychology* with multimedia, the *Mathematics* classroom with an interactive whiteboard.

Thus, despite other numerous needs, both employers and professional organizations approve of these resources and find them appropriate to the aims.

2.2 Study Content and Organisation

Overall, 16 academic personnel representatives are involved in the imlementation of the study program and their academic positions, degrees, qualifications and study courses have been summarised in the table below:

No	Name, Surname	Academic Position	Scientific Degree	Study Course	CP
1.	Baļule Rasma	Lecturer	Master's	Basics of Electrical Equipment	3
2	Bērziņš Agris	Assistant	Master's	Fuel, Furnace, Boilers Thermo Power Plants Thermal Engines Gas Supply	4 3 3 2
3.	Iesmiņa Veronika	Assistant	Master's	Material Studies	2
4.	Ulmane Iveta	Assist. professor	Master's	Entrepreneurial Economics Computer Studies	3 2
5	Silarājs Juris	Assist. professor	Master's	Electrical Drive	3
6.	Dreimanis Oļģerts	Assistant	higher professional	Labour, Environment and Civil Protection	2
7.	Frolkova Renata	Assistant	Master's	Basics of Boilers Water Preparation	1
8.	Grišins Viktors	Assist. professor	Master's	Introduction to Specialty Technical Thermodynamics and Heat Transfer Flow Mechanics Pumps, Fans and Compressors	1 8 3 2

No	Name, Surname	Academic Position	Scientific Degree	Study Course	CP
				Heating Supply Technical Heating Measurements and Process Automation The Use of Computers for Heating Supply Technical Design Safety Regulations	5 4 2 1
9.	Kazuša Anda	Assist. professor	Master's	Engineering Graphics	2
10.	Rūtiņa Kristīne	Assistant	Bachelor	Latvia and Europe	1
11.	Jonāne Lilita	Assist. professor	Master's	Corporate Psychology	2
12.	Margarita Viskova	Assistant	Master's	Higher Mathematics	6
13.	Inta Klotiņa	Assist. professor	Dr.phys.	Physics	3
14.	Skujeniece Signe	Lecturer	Master's	English	3
15.	Štekelis Kristians	Assistant	Master's	Technical Mechanics	4
16.	Sandra Stūrīte	Assistant	Master's	Labour, Environment and Civil Protection	2

To ensure the qualitative acquisition of the professional study program, a lot of attention is paid to internship, practical and laboratory assignments, work and seminar organization and management. Work descriptions, methodological materials, which ensure successful work execution are available in the college library and in classrooms. The quality of the completion of these assignments essentially affects the final evaluation of the study course. The internship programs distributed to the students upon its initiaton, reflect the content of internship, the documents to be submitted to the internship supervisor and the evaluation criteria. The tasks of term and qualification papers are reviewed and approved of at the department meeting:

On the whole, the overall number of contact lectures comprising 2500 academic hours includes theory (40%), practical assignments (20%), internship (25%), and the qualification paper design (15%). It is considered that such distribution is relevant for achieving the goals of the higher professional education study program.

2.3 Studies and Evaluation of Knowledge

To ensure qualitative acquisition of the professional study programme, RTC has developed an up-to-date heat power supply laboratory equipped with various equipment (e.g. automated process adjustment). As well as this, the students can use the examination centre with a computer classroom (25 workplaces with the Internet access). Theoretical studies are conducted in the classrooms equipped with multimedia and provided with the Internet access.

RTC Power Engineering department has 3 such classrooms.

RTC has developed the most up-to-date electronics laboratory in Latvia, computer classrooms of IT department are also available, the *Corporate Psychology* classroom is equipped with multimedia, the Mathematics classroom with an interactive whiteboard.

2.4 Study Provision and Management

Fund allocation to education is insufficient in the Republic of Latvia. Therefore, RTC administrative and technical staff's opportunities are limited (There are only two laboratory technicians one with 0.5 load and the other with 0. 25 load, which, taking into consideration the amount of the equipment used, is not enough). However, it is worth mentioning that the personnel work with a complete involvement and enthusiasm that is why the study process results can be considered as well established and good. This has been admitted by both students and graduates in their answers in annual questionnaires.

All academic personnel as well as students' groups have e-mails that can be used to acquire study courses autonomously. A part of the study materials is sent to the groups' emails, another part is available at www.rtk.lv.

In 2011, the RTC building of the study unit has been renovated as a result of which the study environment has improved considerably.

The Students' Board operates in accordance with the Professional Education Competence Centre *Riga Technical College* developed Guidelines about students' board accepted at RTC Board meeting of December 02, 2008, meeting minutes No 40-2008. The Student Board operates at 16 Braslas Street Room 118, Riga, LV-1084, e-mail: brasla@rtc.edu.lv.

The library is a structural unit of Riga Technical College, which operates in accordance with the internal normative acts and performs the fuctions of cultural and information centre, ensuring literature and information access, providing, library, bibliographical services, consulting students and academic personnel.

The main objective of the college library is to provide the study process with the required information resources and services in accordance with the study program requirements in all specialties. This also implies the selection and arrangement of published sources. The library employees regularly perform the inventory and sistematisation of the resources and provide the informative and bibliographical services for the students, academic personnel and employees.

The library contributes to the study process implementation as well as to the scientific research activities of the academic personnel and students.

There are 27 study places, 5 computers and a photocopier in the reading room (97 m^2). The computers are connected to the Internet through the local area network. In addition, the students can access the computers with the internet connection in classrooms and dorms.

The library provides a free access to reference literature, latest publications in various branches and fiction. The library has a subscription to 28 hard copy press and media materials.

It consists of 2 books storage rooms (193 m^2) for reference literature, fiction, periodicals archive and study books and methodological materials for full-time and part- time students in technical branches, i.e. energetics, electronics, telecommunications, metalwork, information technologies, including 8000 lecture methodological notes, which were designed and published within the framework of the EU projects using its funding and Latvian standards.

RTC library supplements necessary scientific literature, study books, and methodological materials for the support of the study program cooperating with the study programs directors and the heads of departments. In 2011, there have been 35 705 units in the library, including 25 537 books, 22 032 of them being study books. Audio visual aids constitute 22, DVD 12 items respectively. The library utilises alphabetical and systematic catalogues.The library employees use the united state catalogue of 9 libraries as well as Latvian National Library and Riga Technical University subscription for the academic personnel.

Since 2009, ordering and receiving books are possble electronically applying for Latvian National Library inter-library subscription.

The library stock involves books and methodological materials in foreign languages – English, German, and Russian.

RTC has a dormitory (4 Ierikļu Street –) and canteen (*Atvars Ltd).*

2.5 Academic Personnel and Students Research (Creative) Activities

Judging from the abovementioned (college facilities, library, and access to employers'equipment), it can be concluded, that the students are exposed to modern scientific

research environment since there are scientific publications of the academic personnel as well as good achievements in the competitions of qualification papers.

2.6. Quality Assurance and Guaranties

The financial resources for ensuring the implementation of the study program are seen in the data of higher education institutions in the section Riga Technical College (http://www.aisp.ikvd.gov.lv) and their usage is controlled annually by RTC Audit Commission which statements are publicized in annual reports.

3 Sustainability

3.1 Study Program Aims and Tasks

The aim of the study program *Heat Power Engineering* is to prepare the students to work with various heat power engineering systems and appliances in accordance with the design of the technological process, comprehension and awareness. The main objectives of the specialists are related to the maintenance and installation of heat power engineering systems, work process organisation and management, energy saving, environmental protection as well as the project management of simple heat power supply projects.

To determine the employers' demand in the graduates, the biggest Latvian enterprises related to the energy sector were surveyed and the results are the following:

Enterprises	Number of employees in heat power engineering		Number of employees in the electrical engineering who require the 4th professional qualification level		Notes
	2009	Forecasted in 2015	2009	Forecasted in 2015	
JSC *Rīgas Siltums*	76	-	112	-	Currently JSC *Rīgas Siltums* employs 1058 employees and more employees are not required, however, in the future the development of the company is planned.
JSC *Latvenergo*	957	1200	1052	1200	In order to renew and ensure heat power engineering branch

					at JSC *Latvenergo* holding on average 15 to 20 employees a year are required.

All employers forecast the demand in the employees in heat power engineering specialties. The forecasts are careful considering the current economic situation in the country.

The Cabinet of Ministers ratified the guidelines for the development of power engineering devised by the Ministry of Economics on 27 June 2006 for the years 2007-2016. (Latvian Power Engineering Development Guidelines for 2007-2016, 2006:65)

As the respondents participated in the questionnaire were aware of the subject to be related to RTC *Heat Power Engineering* study programme, it can be concluded that their interests are taken into account.

RTC has devised its development conception for the period of 2008-2014. The devised document includes the main vision and and mission statements which are to be considered and elaborated on in a more detailed RTC strategic development plan. The document has been prepared having in the basis the forecasts of the stakeholders leading in the economy sector on the development tendencies and requirements. In the process of its preparation enterprises and associations representing their fields of business, as well as RTC administration at different levels: higher level administration, administration of specialties and programs and the heads of departments were consulted. This document has been designed by the chairman of the board of the company *Knowledge Transfer and Marketing Ltd* Roberts Dlohi. It is available at www.rtk.lv for a more detailed exploration.

3.2 Study Content and Organisation

The content and implementation of the study program ensure a continuous and consistent development of the study program and meet four main goals of a higher education (personality, democratic society and scientific development challenges, labor market requirements).

To achieve the abovementioned goals, the first one should be initially addressed, i.e. student's growth and becoming an open, willing to learn, socially active personality since it ensures the achievement of the subsequent ones.

It is considered that the most effective means in achieving this goal is the academic personnel's personal attitude to the student and study environment in the process of the study program implementation.

To determine the students' evaluation of the emotional atmosphere some questions have been included into the students' and graduates' questionnaires. The obtained respondents' results are encouraging. Therefore, it is believed that the students turn into a person suitable for a democratic society in the process of studies.

The academic personnel, involved in the study programme, regularly improves their qualification participating in different events, including international ones related to the domain, the most important ones are presented below:

No	Activity	Name, surname
1.	Exhibition *Power Engineering 2010*	All the academic personnel of the department
2.	*Higher Professional Education in Theory and Practice: International Scientifically Practical Conference*, Riga, April 27, 2010. RTC.	All the academic personnel of the department
3.	The seminar *Enhancing the Involvement of Politics in the Use of Renewable Energy Recourses in Heating Supply in Latvia* organised in cooperation with the Institute of Physical Energetics, Latvian Science Academy and *RES-H Policy* project on 30 March, 2011.	Viktors Grišins
4.	*Higher Professional Education in Theory and Practice: International Scientifically Practical Conference*, Riga, April May 17, 201, RTC.	All the academic personnel of the department

3.3 Studies and Evaluation of Knowledge

To ensure the study program sustainability, it is necessary to follow the changeable labor market requirements which results in constant changes in both study courses and programs. Therefore, continuous changes are made in study course content and study plan.

The introduction of the study course *The Use of Computers for Heating Supply Technical Design* must be noted as the most essential, which current syllabus was developed and confirmed in October, 2011.

3.4 Study Provision and Management

The content and implementation of the study program comply with the main goals of higher education:

- personality development;
- democratic society development;
- tasks aimed at science development;
- observing labor market requirements.

The program evaluation indicators are the students' points of view, the views of the administrative and academic staff, the proportion of the use of latest technologies in the classrooms and during internship.

During the study program acquisition the students are encouraged to develop professionally, i.e. to continue their studies to acquire the second level of higher professional education.

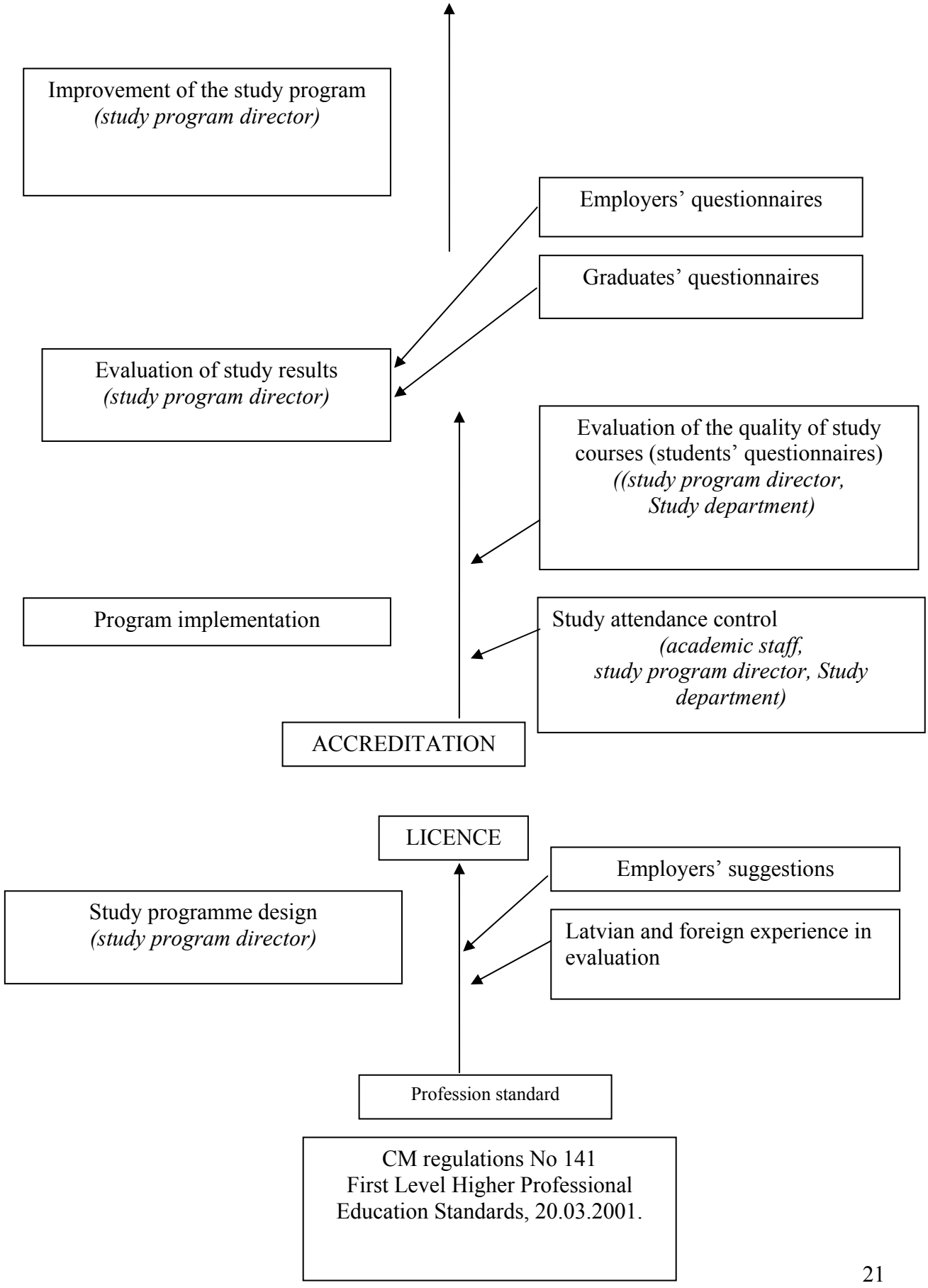
The evaluation methods of knowledge, skills and attitude are considered to be objective, related to the learning outcomes and labor market requirements.

In the process of the evaluation of results both experienced employers' representatives and the leading members of RTC academic personnel are involved. The state qualification examination committee consists of the following members:

No	Committee	Name, Surname	Workplace, position	Education and qualification
1.	Chairman	Egīls Dzelzītis	RTU professor,Dr.hab.Sc.ing., JSC *Lafipa* president	Dr.hab.Sc.ing.
2.	Deputy Chairman	Pēteris Doļģis	RTC deputy director	higher professional
3.	Member	Marijans Valpēteris	RTU assist. professor, scientific production company *GREIN* vice president	Dr.ing.
4.	Member	Valdis Vāravs	the head of *JSC Rīgas siltums* training centre	engineer - mechanic
5.	Member	Viktors Grišins	RTC assist. professor	higher, heat power engineer

Examination results, students' preparation lacks as well as their achievements are reflected in the annual reports of state qualification examination committee. The disadvantages shown are considered as tasks for the study process improvement.

RTC Study Program Management System is designed in the following way:



The Latvian National Development Plan for 2007 – 2013 emphasizes that the most important resource of Latvia is human resource. Therefore, the government will ensure a certain support to the educational system and continuous education sector. Higher education is the basis for the society knowledge. Thus, it is crucial to ensure the opportunities for qualitative acquisition of higher education to all interested. A special attention should be paid to the increase in the number of students in exact sciences, medicine, engineering.

The government also guarantees its support in restoring the prestige of pedagogue's profession and informing the society about the variety of professions and study programs offered by higher education institutions.

Analyzing the Latvian National Development Plan for 2007 – 2013, RTC conception of the development strategy for 2008 – 2014 was developed and accepted. The document has been prepared having in the basis the forecasts of leading in the economy sector stakeholders on the development tendencies and requirements. Considering the abovementioned documents RTC Power Engineering Department Prospective Development Plan for 2008 – 2013 has been designed.

The development of the study program has been envisaged in different directions:

1. The improvement of the structure of the study program:
   a) to ensure both full-time and part-time study modes;
   b) to align term paper and qualification paper content with requirements of enterprises;

   It has been achieved.

   c) To ensure the possibility to take an academic leave and return after it without losing the previously obtained credit points;

   RTC and the program ensure it.

   a) To improve the adaptation and marks transfer mechanisms for the students coming to RTC from different educational institutions,

   This mechanism is operating at RTC.

2. The study program expansion:
   a) to identify the topical knowledge used in the domain outside the scope of the study program and ensure its acquisition.

   It is being continuously implemented supplementing and redesigning study programs.

(2010/2011 ac. year - The Use of Computers for Heating Supply Technical Design)

3. The development of the internship procedure:

a) to involve study program graduates more extensively in internship organization and management;

It has been achieved since many graduates work in various heat power supply enterprises holding managerial or top management positions;

b) to develop methodological materials and provide the necessary support to internship supervisors at the enterprises in pedagogical and methodological issues;

It requires more attention.

c) To organize internship and training for the academic staff in domain enterprises.

It is expected to be implemented.

4. The development of technical facilities:

a) to identify the opportunities to implement joint projects among various enterprises to use technical facilities;

It requires more attention.

b) to stimulate the interest of enterprises about the development of the study program technical facilities;

A considerable improvement has been achieved with the help of enterprises;

c) to design cooperation regulations to determine the conditions to use enterprise facilities in RTC study process;

Although the regulations are yet to be designed, facilities are used due to guest lecturers' activity and the leading positions of college graduates in the heat power engineering enterprises.

d) to identify opportunities and interest of implementing projects regarding the joint use of educational facilities,

It requires more attention.

e) to coordinate study programmes with other higher educational institutions programs to ensure continuity and sustainability;

It has been achieved by signing the cooperation agreement with RTU;

f) to increase the exchange of the academic personnel among colleges and other higher educational institutions.

5. The cooperation with enterprises:

a) attracting guest lecturers and presenters from enterprises;

It is being implemented.

b) Selecting a topical theme important for the enterprise to be developed in the qualification works to foster the novelty of research;

It is being implemented.

c) encouraging enterprise financial support for the study program implementation,

It is being implemented.

d) to attract more study program graduates to the improvement of the study program technical facilities;

It is being implemented with the help of graduates who hold leading positions in domain enterprises.

6. Communication and public relations:

a) The participation in discussions on all relevant topical processes in the country;

It is being implemented.

b) the promotion of enterprises providing good internship recommending it as a good potential employer;

It is achieved by intership supervisors recommending internship places to the students;

c) the promotion of studies at RTC and other institutions,

It is being implemented by the students and academic personnel during RTC information days and in mass media.

Due to the plan execution, the program implementation achievements as well as drawbacks are transparent. Adequate attention should be paid to preventive and corrective actions.

3.5 Academic Personnel and Students Research (Creative) Activities

The academic personnel are involved in scientific research (creative) activities, the themes of which are topical and connected with the interests of the region, the study program content and future development. The results of scientific work are published in internationally available and peer-reviewed issues.

The results of scientific research work are used practically, facilitating innovation. Therefore, the students are also able to choose different topical themes for their term and qualification papers, which are related to the interests of the region and the study program content.

3.6 Quality Assurance and Guaranties

At the end of each academic year the study program self-evaluation report is developed.

It includes evaluation of its strengths and weaknesses, development opportunities, academic resource, technical facilities, financial provision and internal self-evaluation. The report is discussed and evaluated at the Power Engineering department meeting, and it is located at RTC home page www.rtk.lv afterwards.

One of the issues reviewed in the self-evaluation report is the analysis and summary of the results of students' and graduates' questionnaires.

The questions of the questionnaires cover the content and implementation quality of the study program, the level and development of technical facilities as well as the description of the academic and the administrative personnel.

To provide the continuity of the study program a cooperation agreement between RTC and Riga Technical University was signed on 14 September, 2009. In case of study program liquidation, restructurisation or other changes, students are entitled to continue their studies at Riga Technical University, Transport and Machienery Department acquiring the 1st level of higher professional education in the study program *Heat Power Engineering and Appliances*.

The dynamics of the students' and graduates', the graduates'employment trends, the academic personnel qualification and age, finance and research results a s well as the development trends in recent three years are regularly considered in self-evaluation statements and discussed at the Power Engineering department meetings.

4 Cooperation and Overlapping

4.1 Study Program Aims and Tasks

The aim of all the study program related to heat power engineering is to prepare highly-qualified specialists for a successful career in the domain of heat power engineering working with various heat power engineering systems and appliances in accordance with the design of the technological process, comprehension and awareness.

There are different qualification levels and the program volume (implementation period). The study program *Heat Power Engineering* designed at RTC is aimed at preparing middle-level specialists with a clearly expressed practical direction within a short period of time (2.5 years). It is considered that this goal is achieved.

4.2 Study Content and Organisation

Having in the basis clause 47 of the Law of Higher Education Institutions, when transferred from a different institution all relevant study courses credit points and the assessment marks obtained in other Latvian higher education institutions study programs are considered. Thus, the students are entitled to acquire separate modules, study courses and/or have internship (partly or fully) in other Latvian higher education institutions study programs or abroad.

The knowledge obtained during the internship will be considered as a good basis for the design of the qualification paper.

Language skills are expected to be improved considerably. To ensure the academic personnel's participation in international projects an English language course is provided free of charge this academic year. The guest lecturers from other institutions (e.g. A. A.Bērziņš JSC Latvenergo, TEC-1) are involved in RTC methodological work and scientific research.

4.3 Studies and Evaluation of Knowledge

The academic personnel of other higher education institutions is involved in the internal evaluation of the results.

RTC academic personnel actively participates in the seminars of the Latvian Association of Heat, Gas and Water Technology Engineers and prepares specialists for certification. Two certified specialists are involved in the study program implementation (V.Grišins, J.Silarājs)

4.4 Study Provision and Management

In the course of time RTC Power Engineering department has established very good partnerships with different employers, especially due to the fact that many graduates of the study program are employed by these organizations and hold leading positions now.

Their help is very essential in solving any problems, as well as ensuring internship abroad.

4.5 Academic Personnel and Students Research (Creative) Activities

Currently there is no research (creative work) conducted in cooperation with other Latvian or foreign higher education study program students and academic staff. In the nearest time these activities are supposed to be planned and implemented together with RTU, Faculty of Transport and Machinery.

4.6 Quality Assurance and Guaranties

Riga Technical College cooperates as an associate member with:

- Latvian Electrical Engineers and Power Construction Engineers Association (LEEA);
- Latvian Information and Communication Technology Association (LIKTA);
- Latvian Authorised Dealers Association (LPAA);
- The Ministry of Education of the Republic of Latvia Quality Service, expert (College Association delegation);
- Higher Education Quality Assessment Centre of the Republic of Latvia (AIKNC), expert;
- Latvian Electrical Equipment and Electronics Industry Association (LEtERA), board member;
- Machine Building and Metalwork Industry Association (MASOC), expert.

Riga Technical College is a member of Latvian Employers' Confederation.