

The Role of the Feasibility Study in Business Development

Case: ZAO Sibirit-3

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<p>Abstract</p> <p>Nowadays, a feasibility study is a very popular tool in companies, as it is helpful in checking the planned project. The main idea is to estimate if the project technically, economically and operationally is feasible.</p> <p>In this thesis it is explained, why companies need a feasibility study. The main reason is to explain all advantages and disadvantages of an implemented project.</p> <p>This is a qualitative research based on the situation in a real company. The method used is the analysis of the actual implementation of the project in terms of a feasibility study.</p> <p>During the research it was found out, that the feasibility study was helpful for the company's success, as it reduced the production costs. As the production of the emulsion explosives was raised, the savings occurred even more than it was expected.</p> <p>It is possible to conclude that the feasibility study plays a huge role in the business development.</p>			
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1 INTRODUCTION

This research was done as a final work for Bachelor Degree, in Industrial Management Degree Programme. This document was done by combining of the received information, studies and conclusions about the certain topic. My thesis is a qualitative research, which was generated by the concrete case study. It is a qualitative research, my aim was to study the result of the feasibility study and how much it is qualitatively.

My topic is "The role of the feasibility study in business development". During my research in the company's documentation department, I have found out, that there are a lot of different feasibility studies. That is why I decided to investigate if these studies are helpful for the company's success or not. I chose one feasibility study, which was made by the company and then I have had an investigation of the results and the changes happened in the company.

I was highly motivated because this is a case of a real company. This company situated in my home town.

The main goals of the thesis are:

- To investigate the necessity of the feasibility researches, if it is really worth to do.
- To find out the difficulties during the implementation of feasibility research.
- To check, what it actually gives to the company.

From the scientific point of view, this topic is worth to study, because every research consists of scientific facts and rely on experienced things. Every step of a feasibility study is tried to be explained leaning on the theoretical framework and data of the company.

My working stages and methods were different, but mostly it was the research in different aspects of the topic. Firstly, I chose the latest feasibility study of ZAO Sibirit-3 and started with the specific and detailed analysis of it. I checked all information and clarified the unclear points with the workers of the company. Then, continued with the theoretical background, as I wanted to extend my knowledge in this topic. Also, I had interviews with workers on the enterprise, to have more information about the company

and implementation of this feasibility study. Moreover, I collected all info which I have got, and then made a huge study and investigation of all. Then, I came up with the final result.

1.1 THESIS STRUCTURE

This thesis has a clear structure with the division on chapters and subchapters. This way, it is possible to see all the information in a logical way.

It begins with the introduction, where the topic and the reasons for choosing it are stated. Also, there is explained the main idea of further work.

After that the background information is introduced, where the reasons for initiating the feasibility study are discussed.

The next step is the information about the company, what is its main business and how it actually works. This consists of the historical facts, the business, and the way of doing business. This part helps to understand, why this company needs the new developments and the feasibility study.

The theory plays a huge role to explain, what a feasibility study means and how it is possible to use it in a right way. In this part there are explained the definition, types, the right way of using, and the reasons for doing the feasibility study.

After comes the description of the feasibility study. How and why it was initiated, the main technical parameters needed, all calculations of costs and project payback, conclusions, and risks. Of course, in this document I have tried to explain only the main points because it is not the main topic to be discussed.

The main idea of the thesis is to do the research and find explanations for, what was really implemented. In the following chapter it is described what were the advantages and disadvantages in the process of implementation of the feasibility study.

The last but not the least there is the conclusion where the main points of the thesis on the feasibility study as an excellent tool for business development are stated.

1.2 THE STARTING POINT OF THE FEASIBILITY STUDY

ZAO Sibirit-3 initiated a boiler house project in 2014. The company had an acting boiler house, which was equipped with two electric boilers with the capacity of three tons per hour of each steam boiler. That has been in operation from 1992 and has been located on the territory of the plant ZAO Sibirit-3.

The idea was to find a way to reduce the cost of the end product by reducing the cost of production. The reason for lowering the price is to save the market share. The new group of companies "MAXAM" established their production line in Kostomuksha, Karelia, Russia (the same business area as Sibirit-3 has).

In Karelia, there are no problems with electricity. Also, the company decided to take into account liquid gas for making energy. So, the main idea of the project was to decide, which type of fuel (liquid gas or electricity) is the cheapest for exact situation. Not only prices of using boiler house but also the prices of establishment and service were taken into account.

1.3 INFORMATION ABOUT THE COMPANY

Nitro Sibir is a group of companies that consists of 17 enterprises, located in different regions of Russia, in Finland and Australia. It is the largest producer of components of the emulsion explosives in Russia. Close Joint Stock Company Sibirit-3 is a part of this group and is a factory for producing components of emulsion explosives. The location is in Russia, Republic of Karelia, Kostomuksha. This factory is one of the few in this field in the Karelian region and the North-West of the country.

The construction of the factory began in October 2001. In December 2002 the main objects were ready to use, and all the necessary equipment were installed. Moreover, commissioning tests were carried out, and emulsion explosives started to get shipped. In May 2003 the factory was put into operation.

Nowadays, the company employs 50 workers. The organizational structure is a hierarchy of the individual levels of management and communication between different departments of the enterprise, which circulates the information between themselves. The management of current activities is carried out by the Director-General and the Board (the executive body). The organizational structure is divided into the main production, the auxiliary production and the finance service. All branches are

interconnected and they work in close contact with each other. All employees work as an one team with the same idea of achieving the efficiency of the factory.

The main manufactured products by ZAO Sibirit-3 are emulsion explosives:

- Sibirit-1000
- Sibirit-1200
- Sibirit-2500RH.

The main customers are:

- Open Joint Stock Company “Karelskiy Okatysh” (mining and processing)
- SibiritFn Oy
- Limited Liability Company “Karelvzryvprom”. (Vladimirov V. (2016). Interview.)

In Figure 1 it is possible to see the building of the production line, where emulsion explosives are produced. Also, it is possible to see the trucks, which are used to transport these goods at any distances.



Figure 1. ZAO“Sibirit-3”, production line, Kostomuksha, Russia, taken by Ekaterina Levina.

2 DEFINITION AND EXPLANATION OF FEASIBILITY STUDY

The main idea of a feasibility study is to explore, analyse and evaluate a planned project. The research also answers questions of technical feasibility and financial profitability.

Moreover, one of the aims is to estimate expenses and costs. It is possible to say that the most important thing is to analyse strengths and weaknesses of the project. The characteristics can be objectivity and rationality of all actions, costs and plans.

The approach needs to be as unprejudiced and unbiased as possible in order to provide correct information and facts for decision making.

The purposes of a feasibility study:

- Determination of potential (technical and financial)

- Expediency of moving forward with the project.

Usually, the documentation looks like a formal report which is done for the head of the company, investors etc. (Naiyer, J. 2015.)

Nowadays, long-term planning is a big problem because of the chameleonic world and a huge part of forecasting. If we use the feasibility study in a correct way it can be an excellent tool for reducing the problems and difficulties of a long-term planning.

There are a lot of critical key factors in the process of a feasibility study. The most important matter is to ensure, that the company deals with correct facts and assumptions, and up to date financial data. If the feasibility is established correctly, then it will be the huge advantage for business success.

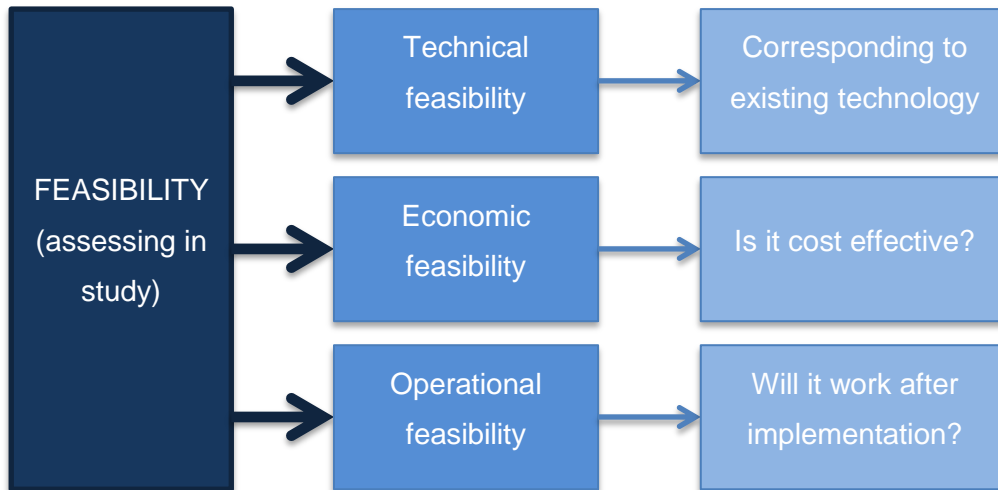


Figure 2. Types of feasibility.

From this scheme, it is possible to see some more important types. (Overton, R. 2007).

As Bryce (2016) describes the feasibility study content:

- The Project Scope (define the business problem, clear stated; opportunity to be addressed; define project participants)
- The Current Analysis (define the method of implementation; analyse current system once more, maybe only modifications needed; the strengths and weaknesses of approach; correct all coming problems)
- Requirements (how they are defined)
- The Approach (the recommended solution; satisfy the requirements; explanation of choosing this way; if it is still practical and viable solution; estimation of other alternatives)
- Evaluation (cost effectiveness; also alternative solutions; extra expenses).

According to Wolfe (2016) feasibility study is to help with:

- Clarifications of the steps needed for company success

- Identifications of different kinds of problems (logistical, business-related, economical) and solving them

- Developing of various strategies (marketing, financing, etc.)

- Ensuring the company, that feasibility study will work as a solid foundation for further development of a business plan.

This kind of study is especially important if large amounts of money are involved into the process. It represents not only the advantages and disadvantages but also a common sense approach to planning. (Bryce, T. 2016.)

From feasibility studies, it is possible to see detailed information about business, products, services, market, logistics, deliveries, resources, etc. The main idea of every enterprise owner is to run a business efficiently, and a feasibility study is one of the tools to help business owners. (Wolfe, L. 2016.)

3 CASE DESCRIPTION

ZAO Sibirit-3 initiated the project in 2014. The main idea was to choose the most suitable way of getting energy for production purposes. The reason for this research was the construction of the new factory “MAXAM” with the same output products (as said in Chapter 1.2).

There was a boiler house (see Chapter 1.2). Three types of fuel were chosen for the project research: liquid gas, wood, and electricity. The feasibility study of “Sibirit-3” found out, that liquid gas is the most reasonable way to produce energy. The plan included not only costs of using, but also necessary investments and the costs of using. Finally, the best option was found in using liquid gas and building a new boiler house.

The main points of the feasibility study are stated here. The idea is to explain the business plan for building a boiler house on liquid gas. At the same time, the reasons for choosing this particular type of fuel are presented in the next chapters. All the information is based on the Business Plan of ZAO Sibirit-3 (Business Plan, 2014).

3.1 BEGINNING OF THE FEASIBILITY STUDY

The production of the steam boiler with LPG for ZAO Sibirit-3 has been deeply researched. The market of the necessary equipment has been widely studied. Also, there were received and considered some offers on the subject of quality, capacity and efficiency of the boilers, the ratio of price and volume of included equipment, components, and services.

As a result, the business proposal of OOO “Baltkotlomash” was reviewed in the feasibility study. They offered their services for the construction of a modular boiler house on the base of one steam boiler ICI SIXEN 3500 with the accompanying extra work.

A single steam boiler (ICI SIXEN 3500) is used for the production of steam, together with a gas burner ECOFLAM. Consumer’s steam supply is provided through the common collector. Raw water, with the help of increasing pressure station, is fed to the automatic installation of the softeners/iron removal/water treatment. Then, the water is fed into the deaerator DEG3000 where it is mixed with the returning condensate. The water is heated by steam in the deaerator and then fed into the feed pumps. Produced steam is supplied to the main collector and then goes to the place of use.

The contractor's work included the following:

- Project works for boiler house
- Building of the boiler house according the project
- Delivery of the ready boiler house and equipment to the place of installation
- Installation, commissioning and routine-up works on the place of exploitation
- Examination of the industrial safety.

The ZAO Sibirit-3 works included the following:

- Construction of the foundation
- Supply external networks.

3.2 TECHNICAL CHARACTERISTICS

3.2.1 BOILER HOUSE

Boiler house is a variable height building module, the size of it is 7x6x6(3)m (LxWxH). The module consists of hard metal frame, lined with insulation sandwich panels. The building corresponds to the climatic requirements. There are heating, ventilation, water pipes, sewerage, electricity, fire extinguishing system and signalling parts in the boiler house. The module space has a boiler room (two modules), and a deaerator room (one top module).

Also, the boiler equipment specification is found in the feasibility study. All needed parts and devices are mentioned there. There is a huge specification with the names and characteristics of all needed equipment.

3.2.2 GAS SUPPLY

The calculation of the necessary equipment is carried out by the following data:

- Boiler power 2200 kW for making 3.5 t/h of steam
- 12 working hours per day
- LPG stock for five days
- Max vapour LPG consumption is 84m³/h or 185kg/h
- Vapour density 2.2 kg/m³
- Liquid phase density 560 kg/m³
- Active capacity of the tank $9.2 \text{ m}^3 \times 0.85 = 7.85 \text{ m}^3$
- LPG consumption $185 \text{ kg/h} \times 12 = 2220 \text{ kg/day}$ or 3928 l

It seems that using three tanks per 9.2 m³ will be enough LPG for six days (12 working hours).

3.3 COMPARATIVE ANALYSIS OF THE ENERGY CONSUMPTION COSTS

Comparative analysis of the energy consumption costs was made by the professionals of ZAO Sibirit-3. It was found out that the annual production of the emulsion explosives is near 12 000 t. Also, the needed amount of steam required for production of 1 t of emulsion explosives equals to 0.108 t. From these numbers it is possible to conclude that the amount of steam required for production of annual emulsion explosives is 1296 t.

The Table 1 shows the main differences in energy consumption costs. It is possible to conclude that LPG is much more cheaper than electricity in consumption costs.

TABLE 1. Comparative analysis of the energy consumption costs. (The average currency rate for 2016 is 75.19 rub per one eur)

Parameter	LPG	Electricity
The amount of energy needed for production of 1 t of steam	52.86 kg/h	833.30 kW/h
Annual amount of energy needed for production steam	68 502.86 kg	1 079.95 thousand kW/h
Cost of the resources	32.00 rub/kg	4 011.17 rub / thousand kW/h
Annual cost of the resources	2 192 091.43 rub	4 331 892.00 rub
Cost of the resources per ton	182.67 rub/t	360.99 rub/t

3.4 COMPARATIVE ANALYSIS OF THE OPERATING COSTS

3.4.1 OPERATING COSTS

From Table 2 and Table 3 it is possible to compare operating costs. It means that LPG again has better results. It takes less money for operating than electricity boiler house. The annual savings (without taxes) is 2 062 647.72 rub or 171.89 rub/t.

TABLE 2. Operating costs for the LPG boiler house (The average currency rate for 2016 is 75.19 rub per one eur).

Parameter	LPG
Electricity for automation	63 495.70 rub
Wear parts (water treatment)	200 000.00 rub
Other parts	20 000.00 rub
Amortization	1 596 610.17 rub
LPG	2 192 091.43 rub
TOTAL	4 072 197.30 rub
TOTAL per 1 ton	339.35 rub/t

TABLE 3. Operating costs for the electricity boiler house (The average currency rate for 2016 is 75.19 rub per one eur).

Parameter	Electricity
Amortization	0.00 rub
Operators (2 workers)	1 417 236.35 rub
Electric power	4 331 892.00 rub
TOTAL	6 134 845.02 rub
TOTAL per 1 ton	511.24 rub/t

3.4.2 CASH FLOWS

From the feasibility study of ZAO Sibirit-3 the annual savings (without taxes) is 4 056 532.52 rub or 338.04 rub/t. This savings is possible to have, if to change the electricity to LPG.

TABLE 4. Cash flows of the LPG boiler house. (The average currency rate for 2016 is 75.19 rub per one eur)

Parameter	LPG
Electricity for automation	74 924.93 rub
Wear parts (water treatment)	236 000.00 rub
Other parts	23 600.00 rub
LPG	2 586 667.89 rub
TOTAL	2 921 192.81 rub
TOTAL per 1 ton	243.43 rub/t

TABLE 5. Cash flows of the electricity boiler house. (The average currency rate for 2016 is 75.19 rub per one eur)

Parameter	Electricity
Operators (2 workers)	1 417 236.35 rub
Electric power	5 111 632.56 rub
TOTAL	6 977 725.33 rub
TOTAL per 1 ton	581.48 rub/t

It can be concluded from these two tables that the total cash flow is cheaper for LPG. This was found out in feasibility study. The company will save approximately 340 rubbles per tons. If we count the annual production, the difference will be more than four millions rubbles. This amount of money is worth to save as it is a huge amount for business in Russia.

3.5 INVESTMENT COSTS

Based on the business plan (2014) the cost of work according to commercial offer is 16 540 000 rub, including VAT 2 523 050.85 rub. There are included the costs of all needed work and equipment, also all establishment costs. This amount of money can be taken from the company for investments. Of course, it is quit big amount, but still possible to implement.

According to the business plan of the company conditions of payment were:

- 50% advanced payment
- 40% after the notification that the boiler house is ready
- 10% after signing of checking papers.

Other costs (not included in commercial offer):

- Construction of the foundation
- External networks of the supplier
- Personnel trainings

The source of financing is the own funds of ZAO Sibirit-3. A part of investments will be returned with the VAT refund (2 523 050,85 rub).

3.6 CALCULATION OF PROJECT PAYBACK

The purpose of the company's project for changing the electricity to the LPG is to reduce operating costs of the company. It does not concern other aspects of its businesses. The differences between the two costs (the costs (flows) under the existing scheme and the new project) are taken into account when the payback is calculated.

- Differences between operating income and expenses are 515.66 rubs per quarter and 2 062.60 rub annually.

- Revenue is 1 014.13 rub per quarter and 2 056.50 rub annually.

From Table 6 it is possible to see that, if the production volume is standard (12 000), the company needs 11.3 years to get total payback. If the production rises, time will be shortened.

TABLE 6. Project Payback.

Volume of the annual production, tons	12 000	15 000	20 000	32 000
Simple payback, years	11.3	9.6	7.5	6.3
Discounted payback, years	34.1	20.3	12.0	9.1

3.7 CONCLUSIONS FOR THE FEASIBILITY STUDY

There were drawn some conclusions in the feasibility study. There were summed up main reasons for implementing the project. All advantages and disadvantages were taken into account. The most critical factor was to make go/no-go decision. It was decided to implement the project because of the many factors.

The existing electric boiler has been in operation 22 years, and shortly it will require investment in capital repairs and upgrades because of the generated resources. From the estimated costs of the electric boiler house renovation and building of the LPG boiler house it was possible to conclude, that the second way will be cheaper for the future production.

Implementation of the LPG boiler house will save up to 171.89 rub/t of operating expenses of the enterprise for the production of steam at the current cost of electricity and the production volume of 12.000 tons per year.

The company will receive current profit in the first year of operating the new boiler house. This shows, that the project is worth to be implemented. The enterprise will receive positive current cash flow in the 1st quarter of 2015.

There is counted that the payback period will be quite long if to produce 12.000t of emulsion explosives.

There are mentioned risks of the feasibility study in Chapter 3.8. These all points can be avoided with the careful consideration of every action.

3.8 RISKS

The main risks were also described in the feasibility study. The main idea for that is to avoid and predict them.

There is no potential supplier and commercial proposals for gas cost. Also, there is no guarantee of uninterrupted supply and relative stabile price of LPG. This can cause a lot of problems. Stable gas supply is needed for the production process. The problems with the gas deliveries can cause the stop of the production.

The volume of consumed gas is not confirmed by operating practice. So, there is a risk to exceed consumption of LPG. This risk can cause the higher price for the production.

Exploitation of one boiler can cause the risk of an emergency stop of the production line. This need to be developed, the boiler should be in a good condition all the time or the second boiler need to be installed.

Technical failure can be counted as a risk. Any breakdown in equipment can cause the business interruption and a money loss. This means that service maintenance need to be done systematically.

4 RESEARCH

In this chapter, the project is analysed from different perspectives: How it was implemented in real life, what difficulties were met and how they were solved. Explanation of occurred changes in the implementation of the project is in this research.

As it was mentioned in Chapter 3, the feasibility study was initiated, and the main reason was to optimize the production expenses. This will further develop the cost and price of the final product. ZAO Sibirit-3 needs this, because of the construction of a new similar factory in the same area.

From the first point of view, it was possible to say, that this feasibility study is a great work done by workers of the company and its every detail was studied carefully.

4.1 CONTRACTOR

As for the implementation of the project, all work was done by the initial company (OOO "Baltkotlomash"). All in all, they have done everything according to the agreement with the enterprise. Of course, there were some disadvantages in their work. The construction was a little bit late because of them, and the whole timetable was shifted. So, they did not manage to do their work in proper time, but we can say in justification that these problems can occur in any project, and the reason for that is the real construction and is not the same as the ideal plan on paper. Another problem was with the documentation that the exchange from supplier's side was also late, so the information flow was also late and was not on time. In Russia, we still need original documentation and sometimes sending through post takes time, because of that, the timetable was changed several times during the implementation. For example, extra equipment was needed in the project. The contractor sent the information at the last moment, so it took longer time to get it and, so, construction was suspended for some time.

With work division there were no problems; everything was done according to the plan. So, the contractor had a complex work. On company's side there were construction of the foundation and supply external networks. The division of the tasks was clearly stated from the beginning and were done according to this plan.

4.2 TECHNICAL CHARACTERISTICS

With the real construction, everything was done according to the main plan from the feasibility study (see chapter 3.2). The contractor implemented the project and agreed that with the ZAO Sibirit-3. Then, the building of the boiler house was done concerning the initial plan. After that, they delivered all the equipment to the factory's surroundings and installed everything there. The next step from their side was to make everything in work condition. During that time, several changes were done:

- There were problems with door valves during the wintertime. That is why the placement was changed from outside to the inside. As a result, the problem was solved.

- The dispatching system was changed a little bit, as it did not match with the system of the enterprise. It took only half a day to make all the settings. This was because of the different IT systems. So, this works still without the problems.

- One more challenge, which was not taken into account and was found out only during the exploitation. The problem was in a different content of propane and butane in a gas mixture. Concerning the project, it was 50% and 50% (also, the burner was set to this percentage content). It is not workable in wintertime and even not possible to buy from providers, as they have a mix of 20% butane and 80% propane. This mix is done in order not to allow gas to be frozen. The disadvantage is the reduction in the calorific value of gas and an increase in consumption. As the production values were increased, the solution was to rent a tank container for gas storage (10 tons). It fits into the costs of the project.

The built boiler house can be seen in Figure 3. This is the constructed LPG boiler house. The main idea of this thesis is to find out and explain the role of the feasibility study. But there are also many significant outcomes, which cannot be seen, even they play a huge role in the whole business process.



Figure 3. ZAO “Sibirit -3”; boiler house, Kostomuksha, Russia. (Vladimirov Vladimir)

4.3 GAS SUPPLY

At the moment, there are two permanent gas suppliers. The costs for the gas are always monitored. The cost has been stable during the last months. It is good to have two suppliers, because if one raises the price or stops the work then the company will be able to use the second one still. From the economic department I got the information that in September 2016, the price for these suppliers was raised, but not so much. And, even with the higher price, this project is much more efficient than the electricity boiler house. The work with gas is inordinately effective and cheaper than with electricity. The surroundings and environment were taken into account when managing the project (Vladimirov 2016).

4.4 COSTS

4.4.1 ENERGY CONSUMPTION AND OPERATION COSTS

All accountings in the feasibility study were done according to the production of emulsion explosives equal to 12 000 t per year. So, approximately 1 000 t per month was taken into account.

Right now the production per month is 3 100 – 3 400 t (more than in three times). It is possible to say, that energy consumption and operation costs were also raised approximately three times. That is why the construction of a new boiler house was a good idea, because of the more efficient way, and the company can save much more money.

Moreover, the needed amount of LPG varies. From the plan, we have one stable number, but the real one depends on the season and working time. For example, in the 1st quarter in 2016 LPG was needed 6.97 kg/t in average, in the 2nd and the 3rd quarters in 2016, the need was 8 kg/t and 7.07 kg/t. The average need is 7.3 during this year.

4.4.2 INVESTMENT COSTS AND PROJECT PAYBACK

All investments were made according to the plan. There were some insignificant changes, but in total, the planned money was taken to the construction and other expenses.

Even the changing of door valves and renting a tank for LPG did not exceed the total amount of money needed concerning the plan.

To conclude, the annual economy is a real factor right now, and as the production was increased, the saved money can cover the construction costs faster, than it was planned.

4.5 INSPECTION

The final case was the examination of the industrial safety. It happens so that all fits into the standard safety rules in the place of establishment. The construction and exploitation do not damage the environment.

One more aspect was the safety of workers. This means, that this system was constructed with the careful thinking about requirements for people, from the coveralls and gloves to the training of the personnel about safety in the workplace and the rules of the first aid (Vladimirov 2016).

5 EVALUATING THE PROCESS

I would like to say that I have a real success in study of the feasibility study. This was an interesting question and a good experience for me. This thesis helped me to develop my analysing skills and I extended my knowledge in the theoretical background of a certain topic.

With the help of the research, I understood that every step of the changes need to be carefully studied and all even small risks should be taken into account. I will use this experience in my future life and career.

What about disadvantages, there was investigated only one feasibility study in the thesis. The conclusions of the thesis concern only the exact company and the exact situation. This can be a question of a development of the research, to study more feasibility studies and experiences of other companies, too.

6 CONCLUSIONS

To sum up, feasibility studies are a critical factor in business success. From this research, it can be concluded, that the technical feasibility of the project helped ZAO “Sibirit-3” to reduce production costs. Only some things were changed during the implementation. It was unpredictable but well managed. From the economic side, the saving at the end was even more than predicted, as the production volume was increased almost in three times.

All in all, everything was based on the correct and real facts, which was the perfect base for developing the whole planning and process. Even if you have a perfect base and a great business idea, you will still need to find a cost-effective way to market and sell the products and services.

A feasibility study needs to contain all detailed information, all business structure and further plans. Of course, a feasibility study can show that the project is worth to implement, but if to take a lot of projects at the same time, then it is not possible to perform all of them together at the same time.

Feasibility study can be an excellent tool for troubleshooting and long-term planning. But the main idea is to use it in a right way. If everything is carefully studied with the up to date information and real facts, then you can get quite a nice result from your project. There are explanations of the in Chapter 3, that feasibility study of ZAO Sibirit-3 is based on the real situation.

There are different difficulties, which may occur during the planning and implementation. Also, it is possible for the whole project to fall, if something unpredictable happens (e.g. some disasters).

In the end, I would like to say, that every business needs to have feasibility studies, to ensure that the changes will be fine for the company. It is usually better to think carefully about your decisions and do not do anything spontaneously.

The last thing to say is that my research cannot give a 100% guarantee that feasibility study will work in every situation. This research shows only one investigation. So, this topic is a worldwide question, which should be developed further. But I have explained and studied only the one feasibility study.

REFERENCES

Business Plan. Construction of the boiler house (liquid gas fuel). (2014). ZAO "Sibirit-3", Kostomuksha.

Bryce, T. (2016). The Elements of a Good Feasibility Study [reference ,made 14.09.2016]. Available at: <https://www.projectsmart.co.uk/elements-of-a-good-feasibility-study.php>

Naiyer, J. (2015). Feasibility Study: Technical Notes & Discussion [reference made 10.09.2016]. Available at: <http://feasibility.pro/feasibility-study/>.

Nitro Sibir. (2016). [reference made 10.06.2016]. Available at: <http://www.nitros.ru/en/>

Rodney, O. (2007). Feasibility Studies. Made simple. Martin Books Pty Ltd [reference made 08.08.2016].

Vladimirov V. (2016). Interview. Topic: information about the company. Kostomuksha: ZAO "Sibirit-3".

Vladimirov V. (2016). Interview. Topic: Results from the implementation of the project. Kostomuksha: ZAO "Sibirit-3".

Wolfe, L. (2016). How to Write a Technical Feasibility Study [reference made 13.09.2016]. Available at: <https://www.thebalance.com/writing-technical-feasibility-study-3515778>.

